



# **WALIIF HEALTH SCIENCES AND BUSSINESS COLLEGE**

## **DEPARTMENT OF NURSING**

### **Generic comprehensive Nursing curriculum**

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Harar, Ethiopia**

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## Acronyms & Abbreviations

AV	Audio Visual
AVA	Audio Visual Aids
BSC	Bachelor Science
CBTP	Community Based Training Program
CC	Core Competencies
COC	Certificate of Competence
CGPA	Cumulative Grade Point Average
DOCS	Direct Observation of Clinical Skills
EtCTS	Ethiopia Credit Transfer System
FMOE	Federal Ministry of Education
FMOH	Federal Ministry of Health
HR	Human Resource
HRH	Human Resource for Health
HSEDC	Health Science Education Development Center
MDG	Millennium Development Goal
MSH	Management Sciences for Health
PBL	Problem-Based Learning
PHC	Primary Health Care
PHCU	Primary Health Care Unit
PN	Pediatrics Nursing
PRRE	Personal Research and Reflection Exercise
SDL	Skill Development Lab
SPH	Social and Public Health
TTP	Team Training Program
TVET	Technical & Vocational Education & Training
WHO	World Health Organization

## **Background (Context)**

World Health Organization (WHO) has designated Ethiopia as having a ‘critical’ health workforce shortage & ranked in the lowest quintile among African nations in terms of density of healthcare personnel. The health workforce crisis in Ethiopia is characterized by an absolute shortage of trained health workers; an imbalance in the numbers of different health worker cadres; uneven distribution of health workers between urban & rural areas; under-production of trained personnel; low retention, including a “brain drain” of health workers to developed countries that offer better compensation; & a poorly motivated health workforce.

In Ethiopia, the doctor, health officer, nurse and midwife to population ratio is 0.7 per 1000 population, far behind the minimum threshold of 2.3 doctor, nurse and midwife to 1000 population ratio required to ensure high coverage with essential health interventions. Health worker density ranges from 0.24 per 1,000 populations in rural areas to 2.7 per 1,000 populations in urban areas.

Between 2008 and 2013, the health workforce density in Ethiopia has increased from 0.84 to 1.3 per 1000 population, indicative of an improvement in supply and availability of health workers. The marked improvement in the availability of health workers is due to massive scale up of training and education in the last two decades.

The number of public higher educational institutions have increased from eight to 57. Of these, 34 are universities and hospital-based colleges offering degree programs while 23 are regional health science colleges offering technical and vocational qualifications (level 1 to 5). Private health science colleges have also flourished, with 24 institutions offering accredited programs as of 2012/2013. There has also been parallel expansion in enrollment and graduation outputs. Over sixty thousand health science students were enrolled in public higher education institutions; and an additional 15,834 in private higher educational institutions as of 2012/2013. Annual enrollment of health science students in public higher educational institutions reached close to 23,000 (58 % in regional health science colleges) in 2014. Graduation output from higher educational institutions has increased close to 16fold from 1,041 in 1999/2000 to 16,017 by 2012/2013.

Scaling up educational program to produce more doctors, nurses, midwives & other health professionals is clearly urgent & essential. Increasing the number of graduates alone, however, will not solve the more intractable problems facing the health workforce. In order to transform

population health outcomes, the current efforts to scale up medical education must increase not only the quantity, but also the quality & the relevance of the providers of the future.

The current reality is that educational institutions are not sufficiently integrated with the relevant local, regional, and national health authorities to ensure an effective alignment between medical education, research, health service delivery, and population health needs. In many cases today, educational institutions are isolated from national health systems and from health service delivery, limiting their ability to prepare graduates to respond to the evolving policies, epidemiology, and technologies relevant to their eventual practice sites. The curricula may not accurately reflect the disease burden of the areas in which health professionals are most urgently needed. The scientific content of their education may be poorly matched to the epidemiology of the communities in which they work. The educational methods are static and fragmented and shortages of teaching staff severe. Clinical training sites are most often urban tertiary centers whose practice conditions may be very unlike those graduates will ultimately face. Finally, the failure to orient medical education to the needs of the local health care system and the most relevant models of care delivery may leave graduates unprepared to serve as advocates for improving the health care system around them.

## **College profile**

WALIIF Health Sciences and Business College (WHSBC) is one of the five sectors under WALIIF Health Care S.C., which is founded by shareholders from private health company, banks and insurances, private investors, public sectors, health professionals, and individual people (farmers, students, etc.). WALIIF Health Care S.C has a vision of being an outstanding health care company in providing quality, efficient and affordable health services in Africa and the world. To realize this, the share company has planned to open specialty centers, advanced diagnostic centers, health centers, pharmacies, specialized comprehensive teaching hospital, general hospitals, pharmaceutical industry, medical equipment maintenance, import and distribution centers and, health science colleges.

To fulfill the vision of WALIIF Health Care S.C, WHSBC Harar branch has planned to produce highly qualified health professionals in pharmacy, Medical laboratory, and Nursing, where it has long term plan of opening medical schools, business programs and MPH programs.

WHSBC aspires be a Centre of Excellence in the area of Education, Research and community service. It is an overwhelming health science college in that it provides training of high quality, incorporates English language competency and character development training in all its programs.



## **Mandate Analysis**

Harar WALIIF Health Care S.C, is going to be established and organized by WHSBC Harar branch to produce various categories of mid-level health professionals at higher education level who will eventually enhance the attainment of the objectives of the Ethiopian health policy in general and the strategies contained in the human resource development plan of the country. The college is expected to produce professionally qualified and motivated health professionals. Harar Waliif Health Science and Business College (WHSBC) will be established to attain the following objectives, among others:

- To train various categories of professionals with high quality who will be able to accomplish the objectives of the regional and national health policy within the framework of the health sector development program;
- To produce health professionals who are academically qualified, professionally skilled, and ethically committed to their profession;
- To increase community engagement and provide various community service
- To undertake knowledge-generating, problem-solving research, that will contribute to local, national and global sustainable development.

## **Program rationale**

As in many countries, nurses are the backbone of the formal health system. Nurses are less likely than physicians to migrate out of the country, and they are more likely to serve in rural, hard-to-reach communities. Furthermore, nursing as a profession is often an entry into the formal workforce and a source of economic empowerment, especially for women. Investment in nursing, therefore, brings the triple gain of improving health outcomes, economic empowerment, and improving gender equity.

However, despite the key role played by nurses in addressing the priority health needs of Ethiopia, investment in their education is modest. The number of faculty at nursing training institutions in Ethiopia is severely limited and the curriculum does not reflect local priorities and health needs, making it difficult to educate nurses in sufficient numbers and with the appropriate clinical skills to meet current and anticipated health needs. As a result, the ability to perform tasks associated with key roles is sub-optimal and varies significantly. Furthermore, the mix of skills that nurses acquire during their professional education may not be well matched to their eventual workplace; similarly, the scientific content of their education may be poorly matched to the epidemiology of the communities in which they work. Therefore, there

is a need to invest in nursing education in order to address the quality and the relevance of nursing education to transform population health outcomes.

## **Nursing Educational Philosophy**

In nursing education and training, we believe that the nurses are required to acquire a complex mix of knowledge, skills and attitudes. Trainees are expected to be able to synthesize and apply their learning to new and often demanding situations. Moreover, they are expected to be lifelong learners, acquiring and utilizing skills and attitudes such as self-paced learning and self-motivation throughout their working lives. It is obvious that learners are working in a constantly changing environment and different people. Thus, trainees expected constantly update their knowledge to meet expectations from peoples of different background.

Nursing education helps learners to become intelligent and critical citizens in a democratic society. Put simply, learners have to be taught to fit as a cog into the existing social machinery, or to recognize their own responsibility for the transformation of the social, political and economic world in which they live. Therefore, the purpose of nursing education is to transmit worthwhile bodies of information to generations of learners. The goal of nursing education is to instill in learners the academic and moral knowledge which should constitute those ‘essential things that a mature adult needs to know in order to be a productive member of society. The curriculum is not, of course, an end in itself. Rather, it seeks both to achieve worthwhile and useful learning outcomes for students, and to realize a range of societal demands and government policies.

## **Curriculum model**

The curriculum model of comprehensive nursing education is predominately **outcomes-based education (product model)** and constructive alignment. The major premise the idea that all learning should be defined in terms of what students should be able to do after studying the program, in terms of learning outcomes or learning objectives.

Behavioral objectives provide the foundations on which product models of the curriculum are built. The intended outcome (the product) of a learning experience is prescribed beforehand. The use of behavioral objectives facilitates communication of what is intended and therefore leads to more purposeful learning. The use of behavioral objectives helps with selection of structure and content of teaching; further behavioral objectives lead to more accurate methods of testing and evaluation. Outcomes created at a number of levels – the level of a whole program (such as a degree or training program- described as a ‘graduate’ profile), at the level

of a course. The curriculum is also devised to enable the achievement of more integrated approaches, learner-centered and community-oriented approaches. In the integrative curriculum, nursing education that is organized in such a way that it cuts across subject-matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study”. It views learning and teaching in a holistic way and reflects the real world. Student-centered approach emphasizes adult learning methods and approaches and uses active learning (in which students participate actively in the learning process) rather than a more didactic, teacher-led approach which traditionally saw students as passive recipients of knowledge, as ‘empty vessels’.

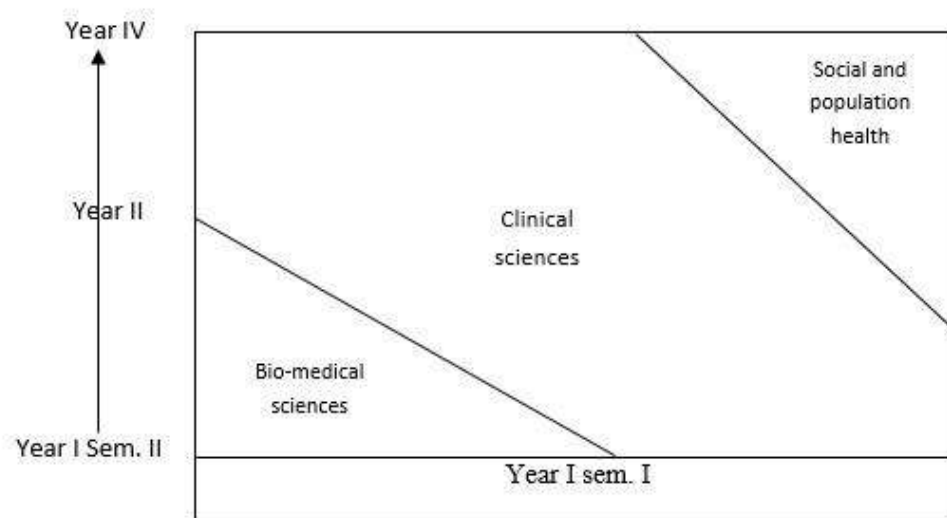


Figure 1: vertical and horizontal integration of biomedical science, nursing foundations,, clinical science and SPH modules

## Graduate profile

Upon completion of the B.Sc. nursing program, the graduates will be able to accomplish the following core competencies:

1. Apply the concepts and models of disease prevention and health promotion in health care service provision
2. Analyze, interpret and use health and health-related indicators
3. Apply methods of nutritional assessment, interpret results and provide nutritional counseling and education
4. Apply principles of public emergency and disaster management
5. Provide basic holistic care for individuals, families, and communities at large of all age groups in a variety of health care settings, using the nursing process as a framework
6. Conduct complete patient assessment using nursing process/other relevant tools to identify holistic health needs and the response of the client

7. Use critical thinking to analyze and interpret health data collected, by using the functional health pattern (Gordon's) /other recent evidence, to establish priorities and make the appropriate decision
8. Diagnose the client's health needs and responses to the actual or potential health conditions
9. Plan appropriate independent and collaborative nursing interventions
10. Identify and manage client problems, responses, potential complications, and collaborative problems of clients
11. Perform basic nursing procedures correctly and independently
12. Perform advanced nursing procedures, assist advanced diagnostic and therapeutic procedures using the latest evidence
13. Perform preventive, promotive, curative, and rehabilitative care for clients
14. Record, document and report patient and health related data
15. Work collaboratively and effectively with other health workers in the care of clients in all health care settings and community health care team
16. Guide, counsel, and teach clients based on their need in all health settings including the community
17. Perform activities in prevention (including counseling), control, and management of emerging and re-emerging communicable and non-communicable diseases
18. Diagnose and manage communicable and non-communicable diseases
19. Provide comprehensive maternal and child health care services
20. Assess and manage clients with special needs
21. Provide comprehensive mental health nursing care
22. Manage common emergency and acute health problems
23. Apply professional, ethical, and legal standards and codes in nursing practice
24. Implement quality improvement measures and maintain a safe patient environment
25. Practice effective therapeutic communication
26. Apply informatics and technology for health data management and patient care
27. Utilize evidences for patient health care services
28. Maintain and practice updated nursing care standards
29. Exercise leadership and involve in the management of the health care system
30. Provide community health nursing services
31. Maintain personal effectiveness and engage in continuous professional development
32. Be nurse educator

## **Domains and competency statements**

1. Sociocultural and public health context of the nursing profession
2. Professional, ethical & legal practice of nursing
3. Comprehensive nursing care and practice
4. Communication and collaboration
5. Leadership and Management
6. Evidence-based practice and research
7. Educational and professional development

## **DOMAIN 1: SOCIOCULTURAL AND PUBLIC HEALTH CONTEXT OF NURSING CARE**

**Competency:** The comprehensive nurses apply the knowledge, attitude, and skills acquired from social, behavioral, and public health sciences based on high quality, culturally relevant, and appropriate health services to clients in all age groups. To achieve this outcome, the graduates are expected to:

- ✓ Comprehend mechanisms of disease causation and epidemiological approaches
- ✓ Analyze, interpret and use health and health-related indicators
- ✓ Apply different types of epidemiological designs
- ✓ Illustrate epidemiology of diseases of public health importance in Ethiopia
- ✓ Apply the concepts and models of disease prevention and health promotion
- ✓ Analyze socio-cultural, socio-economic, psychological, environmental, and behavioral determinants of health and disease at the individual, family, and community level
- ✓ Apply methods of nutritional assessment, interpret results and provide nutritional counseling and education
- ✓ Apply knowledge of HIV, sexual and reproductive health into practice
- ✓ Demonstrate the ability to promote the health of populations by influencing lifestyle, nutrition, and socio-economic, physical, and cultural environment through methods of health promotion, including health education, directed towards populations, communities, and individuals
- ✓ Analyze causes of morbidity and mortality and devise strategies to reduce them
- ✓ Apply principles of public emergency and disaster management
- ✓ Use information technologies for health promotion and disease prevention
- ✓ Apply principles of diversity and provide culturally relevant service to all age groups

## **DOMAIN 2: PROFESSIONAL, ETHICAL & LEGAL PRACTICE OF NURSING**

**Competency:** The comprehensive nurses apply professionalism, and ethical and legal practices by demonstrating standardized nursing care that is consistent with moral, altruistic, legal, ethical, regulatory, and humanistic principles. Client-centered care is providing holistic care that recognizes individuals' preferences, values, and needs, and respects the client or designed as a full partner in providing coordinated, age and culturally-appropriate, compassionate, respectful, safe, and effective care.

- ✓ Perform holistic nursing practices about current patient care information, professional practice standards, guidelines, rules, and regulations
- ✓ Provide a rationale for decisions and actions in matters related to the provision of care for clients
- ✓ Manage teamwork and collaborative performances across an array of functions
- ✓ Apply evidence-based nursing knowledge in the provision of care for the client
- ✓ Document accurately and timely relevant health care data to ensure patient safety and improve health outcome
- ✓ Serve as a role model, change agent, teacher, and mentor in their professional life
- ✓ Participate in ethical decision-making within the multidisciplinary team
- ✓ Take responsibility and accountability for own decisions, actions, or omissions in nursing care delivery
- ✓ Apply ethical theories and principles to make sound decisions related to nursing care delivery
- ✓ Adhere to all relevant ethical codes of conduct and standards set by the profession, including, but not limited to, confidentiality, privacy, and respect for the dignity
- ✓ Advocate for maintaining a standard of care and evidence-based practice
- ✓ Protect clients from incompetent, unethical, or illegal healthcare practices, and unconsented research endeavors
- ✓ Maintain patients' bill of rights throughout nursing care service including, but not limited to, guidance informed choice, and consent
- ✓ Apply compassionate and respectful nursing care
- ✓ Practices within a prescribed legal framework relevant to own practice, including but not limited to, the Constitution, the Children's Act, Nursing Act, National Health Act
- ✓ Report any malpractices, tort, and criminal acts to the responsible body

### **DOMAIN 3: COMPREHENSIVE NURSING CARE AND PRACTICE**

**Competency:** Comprehensive nurses provide holistic nursing care through direct interaction with patients, families, and groups of patients to promote health or well-being and improve quality of life. Comprehensive nursing care will be provided by applying five distinct and sequential processes: assessment, diagnosis, planning, implementation, and evaluation).

To achieve this competence, the graduates are expected to:

- ✓ Assess, diagnose, plan and manage client problems, and evaluate outcomes using the nursing process as a framework

- ✓ Anticipate and manage potential complications and collaborative problems of clients
- ✓ Manage common emergency, acute & chronic health problems accordingly
- ✓ Perform basic nursing procedures correctly and independently
- ✓ Assist advanced diagnostic and therapeutic procedures applied for clients undergoing medical or surgical care
- ✓ Perform preventive, promotive, curative, and rehabilitative care for clients in all age groups
- ✓ Apply biomedical sciences knowledge and skill to manage client problem
- ✓ Provide holistic maternal, newborn, child, adolescent, and geriatric care
- ✓ Take history and collects relevant health data from clients or significant others
- ✓ Performs comprehensive physical examinations to identify physical, mental, or emotional problems of the client
- ✓ Analyze and interpret health data through the functional health pattern (Gordon's) approach
- ✓ Documents and report findings with the patient, the patient family (when appropriate), and the multidisciplinary team promptly
- ✓ Work collaboratively with other health workers to help solicit client information
- ✓ Analyses and utilizes assessment information to make a clinical judgment about the clients' status and responses to actual or potential health conditions.
- ✓ Utilizes expert knowledge to interpret results of screenings and diagnostic investigations performed
- ✓ Formulates nursing and/or medical diagnosis
- ✓ Make prioritization of clients' problem
- ✓ Identify and document expected outcomes and goals
- ✓ Develop a prioritized plan of care that includes interventions and alternatives to attain expected outcomes for the client
- ✓ Reviews and revises the plan with the client, the client's family, and the multidisciplinary team
- ✓ Considers economic, social, religious, cultural, and environmental conditions of the clients during the designing of the nursing plan of care
- ✓ Implements the interventions identified in the plan of care in-line with evidence-based nursing practice
- ✓ Collaborates with nursing colleagues and other members of the healthcare team to implement the plan of care
- ✓ Implement the plan of care with efficient utilization of resources
- ✓ Integrates principles of safety and quality into interventions
- ✓ Documents implementation of the identified plan accordingly

- ✓ Evaluate patient outcomes against stated goals and outcome criteria
- ✓ Monitor progress of client status and adjust nursing care plan accordingly
- ✓ Collaborate with clients, their families, and the healthcare team in the evaluation process
- ✓ Document all processes and outcomes, and keep them confidential

#### **DOMAIN 4: COMMUNICATION AND COLLABORATION**

This domain encompasses competencies that the comprehensive nurse graduate should attain as regards communication, use of technology, and application of basic principles of communications. They are also expected to acquire empathic communication skills and techniques for effective interpersonal relationships with people and other professionals in health care settings. The major competencies that graduate should possess include: -

- ✓ Communicate effectively both verbally and/or non-verbally in the patient care environment
- ✓ Practice proper recording and documentation of patient care-related information and other relevant data produced in their practice environment
- ✓ Demonstrate effective communication with clients/patients, their families, the health care team, and the community at large
- ✓ Forge seamless collaboration and partnership with people within and outside of the health organizations
- ✓ Utilize information, education, and communication (IEC) and behavior change communication (BCC) materials for proper communication and education of clients
- ✓ Apply therapeutic communication skills in the management of client
- ✓ Communicate appropriately in special circumstances and sensitive issues
- ✓ Effectively use information management technologies for health care
- ✓ Provide counseling services for clients based on their scope

#### **DOMAIN 5: MANAGEMENT AND LEADERSHIP**

The competences expected under the leadership and managerial domain involve working as a team leader, change agent, patient advocator, planner, and mentor for the well-being of clients, rapid recovery, independence, and safety through efficient use of scarce resources and instituting a continuous performance improvement process. To address those roles graduates are expected to acquire the following specific competencies.

- ✓ Employ continuous and sustainable quality improvement mechanisms to improve client outcomes and transform future nursing practices



- ✓ Take responsibility for managing and leading health programs at all levels of the managerial hierarchy
- ✓ Act as change agents, role models, and mentors and provide leadership to enhance peoples' well-being and experience of healthcare
- ✓ Play a team lead role and model professionalism to peers and other colleagues in the public health landscape
- ✓ Manage time and resources effectively and efficiently to ensure the nursing quality of care is maintained and the client's outcome improved
- ✓ Apply principles of leadership in the management of clinical care and utilization of resources
- ✓ Advocate for a safe working environment for nursing and medical care provision
- ✓ Participate in the development and implementation of standards, practice guidelines, policies, and protocol
- ✓ Design and facilitate in-service training for health professionals working across an array of functions
- ✓ Monitor and evaluate the progress of the implementation of activities
- ✓ Take initiative and manage changes for the improvement of health service quality
- ✓ Apply management and leadership theories in the execution of nursing care and delegation of responsibilities
- ✓ Attain continuous professional and personal development
- ✓ Materialize participation in nursing councils and other professional societies
- ✓ Apply principles of conflict management in the work environment
- ✓ Envision demonstrating excellence in managing the health system at different levels

## **DOMAIN 6: EVIDENCE-BASED PRACTICE AND RESEARCH**

**Competency:** Actively engage in scientific research endeavors, interpretation, and application of evidence in clinical practice and quality improvement interventions. To achieve this outcome, the graduates are expected to:

- ✓ Search, collect, organize and interpret health and biomedical information from different databases
- ✓ Retrieve and use patient-specific information from a clinical data system by maintaining confidentiality and protection of individual data
- ✓ Formulate hypotheses, collect and critically evaluate data to find a solution for the problems, and disseminate findings.
- ✓ Identify knowledge and performance gaps that can be solved by using systematic methods

- ✓ Use information technology and application systems to manage research data and navigate to access online information and literature
- ✓ Advocate for keeping patients' rights during research activities
- ✓ Utilize updated nursing research findings for evidence-based nursing practice and quality improvement interventions
- ✓ Participate in critical appraisal of research findings and scholarly activities

## **DOMAIN 7: EDUCATIONAL AND PROFESSIONAL DEVELOPMENT**

**Competency:** a comprehensive nurse professional must actively engage in educational quality improvement initiatives and demonstrate competence in the domain of educational & professional development.

- ✓ Acquires current knowledge and skills that reflect evidence-based practice and applies them appropriately in a practice setting
- ✓ Evaluates own nursing knowledge and practice about current patient care information, professional practice standards, guidelines, and rules and regulations
- ✓ Possess professional excellence & competence through continuing education & lifelong learning
- ✓ Apply principles of teaching, learning, and evaluation to design educational programs that enhance the knowledge and practice of staff in the different care unit
- ✓ Participates in formal and informal education of others
- ✓ Mentors staff and students in different care units to develop expertise in the care of patients/clients
- ✓ Mentors' colleagues for the advancement of comprehensive nursing care practice, the nursing profession, and quality of care
- ✓ Mentors' colleagues in the acquisition of clinical knowledge, skills, abilities, and judgment
- ✓ Teach nursing students at college, university, and health facility level
- ✓ Involve in curriculum design and implementation process
- ✓ Demonstrate pedagogic skills in education, and assessment
- ✓ Provide peers with formal and informal constructive feedback regarding their practice or role performance to enhance professional development/advancement
- ✓ Promote professionalism and continuous professional development
- ✓ Demonstrates commitment to the personal and professional development of self and others

### **Program goal**

Nurses are equipped with a complex mix of knowledge, skills, and attitudes and are prepared to contribute to their professional roles expected in the broader society

### **Specific program objectives/outcomes**

To prepare competent graduate nurses who can:

- Provide high-quality comprehensive nursing care ethically and professionally at the individual, family, and community levels and various healthcare settings
- Manage common communicable and non-communicable diseases
- Manage common MCH, RH, emergency, and mental health problems
- Promote and prevent disease in individuals. family and community levels at all levels of healthcare settings
- Lead and manage nursing care services
- Engage in nursing education, research, and advocacy that will improve the nursing profession and services

### Program courses /modules, codes, and ECTS

<b>The year I Modules/course- Semester 1</b>						
<b>Module/course Code</b>	<b>Module/course Name</b>	<b>Cr hr.</b>	<b>ECTS</b>	<b>Week</b>	<b>Delivery</b>	<b>Module/course Category</b>
FLEn1011	Communicative English Skill I	3	5	16	Parallel	Common
Psch1011	General Psychology	3	5	16	Parallel	Common
Math1011	Mathematics for Natural Sciences	3	5	16	Parallel	Common
LoCT1011	Critical Thinking	3	5	16	Parallel	Common
Phys1011	General Physics	3	5	16	Parallel	Common
GeES1011	Geography of Ethiopia and the Horn	3	5	16	Parallel	Common
SpSc1011	Physical Fitness	P/F	P/F	16	Parallel	Common
<b>Total</b>		<b>18</b>	<b>30</b>			
<b>Two weeks break/Department selection</b>						
<b>Year I Semester II Modules/course</b>						
FLEn1012	Communicative English Skills II	3	5	16	Parallel	Common
Phys1012	General Biology	3	5	16	Parallel	Common
Chem1012	General Chemistry	3	5	16	Parallel	Common
MCiE1012	Moral and Civics Education	2	3	16	Parallel	Common
BiomM-1022	Biomedical Science I	6	10	20	Parallel	Supportive
NursM-1033	Foundation of Nursing I	5	8	20	Parallel	Core
<b>Total</b>		<b>22</b>	<b>36</b>			
<b>Year I Totals</b>		<b>40</b>	<b>66</b>			
<b>Year II Modules/course</b>						

Year III Modules/course								
Module/course Code	Module/course Name	Cr hr.	ECTS	Week	Delivery	Module/course Category		
NursM_3013	Entrepreneurship Medical Surgical Nursing II	13	22	20	Parallel	Common Core		
SPHM_2022	Determinants of Health	2	3	20	Parallel	Supportive		
NursM_3032	Maternity and Reproductive Biomedical Science II Health Nursing	9	14	10	20	20 Parallel	Supportive	
		<b>22</b>	<b>36</b>					
Two weeks break								
Two weeks break								
EmTe_1012	Introduction to Emerging Technologies	3	5	16	Parallel	Common		
Anth_1012	Social Anthropology	2	3	16	Parallel	Common		
Econ_1011	Economics	3	5	16	20	Parallel	Common	
SPHM_2052	Health Promotion & Disease Prevention	3	5	20	Parallel	Supportive		
NursM_3033	Pediatric and Child Health Nursing	8	13	5	20	Parallel	Core	
SPHM_2062	Measurements of Health and Global Trends	2	4	3	7	16	20 Parallel	Supportive
GFT_1012	Disease	2	4	3	7	16	20 Parallel	Common
NursM_3053	Mental Health Nursing	5	8	11	18	20	20 Parallel	Core
NursM_2073	Medical Surgical Nursing I	5	8	11	18	20	20 Parallel	Core
		<b>21</b>	<b>34</b>					
<b>Year III Totals</b>		<b>43</b>	<b>70</b>					
Year IV Modules/course								
Module/course Code	Module/course Name	Cr hr.	ECTS	Week	Delivery	Module/course Category		
NursM_3042	Nursing Education and Curriculum Development	2	3	3	Block	Supportive		
NursM-4022	Nursing Leadership and Management	4	7	4	Block	Supportive		
NursM_4032	Nursing Research Methods	3	5	3	Block	Supportive		
NursM_4043	Pre-internship Exam	0	P/F	1	Block	Core		
NursM_4053	Medical Nursing Internship	5	8	20	Parallel	Core		
NursM_4063	Surgical Nursing Internship	5	8	20	Parallel	Core		
NursM_4073	Maternity Nursing Internship	5	8	20	Parallel	Core		
NursM_4083	Pediatrics Nursing Internship	5	8	20	Parallel	Core		
NursM_4092	Student Research Project	2	3	20	Parallel	Supportive		
SPHM_4102	Team Training Program (TTP)	4	7	8	Block	Supportive		
NursM_4113	Comprehensive Qualification Exam	0	P/F	1	Block	Core		
<b>Year IV Totals</b>		<b>35</b>	<b>57</b>					

<b>Grand Total</b>	<b>161</b>	<b>263</b>	
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For the coding of modules, the following is agreed:

The module code shows:

- Home base (to which program/department does the module belong)
- Level of students (years)
- Module/course Number
- Category (1-Common, 2-Supportive, 3-Core)

Example: Module NursM-3013 (NursM- Home base, 3- level of students (years), 01-Module/course number, 3-category of the module/course-Core)

In Ethiopian Universities, for health science students it was agreed that an academic year shall have activities of 80 ECTS credit points and one ECTS credit points corresponding to 27 working hours.

## **Narration and disclaimer of the integrated curriculum**

- ✓ Duration=4 years (students will join Nursing department after the completion of year one semester one from natural science students) or shall take the first-year courses primarily
- ✓ One ECTS=27 Contact hour
- ✓ One ECTS demonstration or laboratory/class practice = 27 working hours
- ✓ One ECTS hospital/clinical practice/TTP = 61 working hours
- ✓ One ECTS for CBTP, TTP=42 hours
- ✓ Total ECTS of the program: 266
- ✓ Total Crhr. of the program=161
- ✓ 40 weeks is one academic year for the program (two weeks break in-between)
- ✓ The program consists of a total Cr hours 161 Crhr. or 266 ECTS to be completed in four academic years.
- ✓ This revised BSC nursing generic curriculum is incorporated the nationally recommended common courses.
- ✓ The academic calendar follows the national harmonized curriculum recommendation of ministry of Education which is From **Meskerem 3 to Sene 30, minimum of 20 weeks** per semester and to be compensated if missed
- ✓ The content adjustment and integration are made in suppose of outcome-based competency
- ✓ Major professional nursing modules include:
  1. Foundation of nursing
  2. Medical-Surgical nursing
  3. Maternity and reproductive nursing
  4. Pediatric and Child Health nursing

## 5. Mental Health Nursing

- Module with clinical attachments/practicum/extensive clinical work
  1. Foundation of nursing I, II
  2. Medical-surgical module I and II
  3. Mental Health Nursing Practicum
  4. Maternity and reproductive nursing Practicum
  5. Pediatric and Child Health nursing Practicum
- Internships in professional practice
  1. Medical Nursing Internship
  2. Surgical Nursing Internship
  3. Maternity Nursing Internship
  4. Pediatric Nursing Internship
  5. Nursing leadership Project
  6. TTP and CBTP
- The promotion protocol is as stated by the here below and the college senate

### **Program admission requirement (eligibility)**

- Candidates must be a natural science student in secondary school & preparatory classes and full fill the following criteria
- Semester two year one students from natural science students
- Meet the set criteria of the Ministry of Education for degree students to join higher learning institution
- Physically and mentally fit for nursing service
- Preferably, those who choose to enter the profession

### **Procedure for Application**

- The applicants should apply to the office of registrar
- The office of the registrar will send the applicants to the department
- The department will select the eligible candidates and notify to the office of the registrar and will be approved by academic commission through the office of registrar.
- After admission candidates have the right for course drop and add according to the rule of the registrar if they fulfill the prerequisite courses
- Candidate can be exempted from non-professional courses if s/he scored A or B on that specific course

## Teaching and Learning Methods

Selection of appropriate teaching and learning methods is of critical importance in a competency in the concurrent model, options or special study modules run alongside the basic core teaching but do not cover the same content area or topic.

Professions, PBL is a method designed to help students learn the sciences basic to generic nurses at the same time they develop the reasoning process used by generic nurses and other health professionals in their clinical practice. The problem comes first without advance readings, lectures, or preparation and the problem serves as a stimulus for the need to know. Problem-based learning is designed to develop integrated, context-specific knowledge base; decision-making/critical thinking process and skills; self-directed, life-long learning skills; interpersonal, collaboration, and communication skills; constructive self and peer assessment skills; professional ethics and behavior. PBL is suggested to be used till nurse professional practice time. During these years, written hypothetical cases will be used while during professional practice real clinical cases seen in the clinical settings will be used to facilitate PBL tutorials. Typically, a PBL tutorial involves a group of 5 to 8 students discussing and analyzing a common patient problem in two meetings over a week, each meeting lasting 2-3 hours. In the first meeting, learners identify problems, generate hypotheses and explaining mechanisms. The days until the next meeting are time for independent self-study of learning issues identified. During the second meeting, students will discuss the learning issues and apply what they have learned to the problem. The best PBL tutor is an individual with broad subject matter expertise and good facilitation skills.

- 1. Role play<sup>1, 2, 3</sup>:** In a role play, learners play out different roles or parts-such as of a patient and provider-in a simulated situation. Role play addresses knowledge, skills and attitude objectives. Role plays promote learning through behavior modeling, observation, feedback, analysis and conceptualization. They are also often useful for exploring, discussing and influencing behaviors and attitudes of learners, as well as for helping learners develop skills such as history-taking, physical examination and counseling. It is also useful for teaching management and supervision skills.

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<sup>1</sup> Jhpiego Corporation. Training skills for healthcare providers: reference manual. 3<sup>rd</sup> edition. Baltimore: 2010.

<sup>2</sup> Jhpiego Corporation. In-service training techniques, timing, setting and media; findings from a systematic review of the literature. Maryland, 2012

<sup>3</sup> The Office for Domestic Preparedness. Training Strategy.

2. **Case study<sup>6, 8</sup>**: Case studies present realistic scenarios/situations that focus on a specific issue or problem, which may be related to diagnosis or treatment of patients, interpersonal skills or any of a wide range of managerial or organizational problems. Learners typically read, study and react to the case study individually or in small groups. Case studies are important to teach higher order knowledge objectives (application, analysis and synthesis) and critical thinking skills.
3. **Simulated practice (clinical skills lab)<sup>4</sup>**: Simulated practice is the use of simulated person, device or set of conditions for instructional purpose. The learner is required to respond to the situation as he or she would under natural circumstances. Simulation takes various forms. Simulation can be static (like using anatomical models that closely resemble the human body or parts of it) or automated using advanced computer technology. Some are individual, prompting solitary performance, or interactive, involving groups of people. In medical education, simulation complements patient-based education and is best employed to prepare learners for real patient contact. It allows them to practice and acquire patient care skills in a controlled, safe and forgiving environment. Simulations are used to develop psychomotor, procedural and clinical decision-making skills. Simulation also aids development of communication and teamwork skills as well as the ability to respond to medical emergencies systematically. Simulated teaching facilitates learning under the right conditions including, but not limited to, learners receiving feedback on their performance, learners having the opportunity for repetitive practice and simulation being an integral part of the curriculum. Clinical skills lab is suggested to be used in the whole years of the ECCN curriculum.
4. **Clinical practicum<sup>5</sup>**: Clinical practicum or clinical teaching is the use of direct patient or client experiences to develop and practice knowledge, skills and attitude required for healthcare delivery or patient care under the supervision of a skilled clinical instructor or preceptor. These skills include generic skills (communication skills, mental and physical examination skills and basic clinical testing and procedural skills), problem-based clinical skills (skills related to patient complaints or diagnoses), discipline-specific clinical skills (such ventilatory management) and continuum of care skills. Clinical learning opportunities include placements at a variety of clinical and community settings for outpatient emergency care, acute care (outpatient and inpatient), operation theatre, chronic care (outpatient and institutional), palliative and end of life care, wellness and preventive care, and populationbased healthcare

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<sup>4</sup> Issenberg, S. Barry MD, Mcgaghie, William C., Petrusa, Emil R., Gordon, David Lee and Scalese, Ross J. Features and uses of high-fidelity medical simulations that lead to effective learning: a BEME systematic review. *Medical Teacher*, 2005; 27(1):10- 28 <sup>5</sup> Association of American Medical Colleges. Recommendations for clinical skills curricula for undergraduate medical education. 2005.



(community, public health). Outpatient departments are appropriate to practice interviewing, interpersonal and counseling skills as well as clinical skills. Inpatient departments (PW) are good to teach patient management, practice healthcare delivery skills including documentation of care plan and treatment given and demonstrate management of rarely seen conditions. Clinical teaching and learning use a variety of techniques including observation, demonstration, role-modeling, practice, coaching, feedback, discussion and reflection. Clinical teaching starts after completion of the theoretical aspect of each professional module and runs throughout the comprehensive nursing curriculum increasing in complexity, level of involvement and responsibility.

- 5. Team training and community-based learning:** Community-based education refers to learning activities that take place outside academic hospital in the community setting<sup>5</sup>. These settings include, but are not limited to, family homes, primary health care networks (health post, health center, and primary hospital), clinics, outreach sites, schools and prison facilities. Uses of community-based education include increasing the willingness and ability of comprehensive nurse to work in rural and underserved communities thereby contributing to solution of inequity in health service delivery; enhancing learning (like PBL) by providing opportunities for students to learn in situations similar to those in later professional lives and opportunities to elaborate on previously acquired knowledge; equipping students with competencies that they would never learn adequately otherwise, e.g., leadership skills, ability to work in a team, the capability to interact with the community, the need for continuity of care, the effect illness has on a family and the early signs of disease and spectrum of health problems; offering an opportunity to learn and work with other health professionals; keeping the curriculum responsive to changing needs of the community; rendering opportunities for partnerships between the community, the college and the government. Hence, on the last semester, students will have a team training program for a blocked 8 weeks. During this attachment, depending on student number and logistics, students will be distributed among different community-learning sites.
- 6. Laboratory practice:** Students will have opportunities for demonstration, guided practice and coaching in labs to deepen their understanding and apply principles and methods of basic and clinical sciences.

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<sup>5</sup> MohiEldin M.A. Magzoub and Henk G. Schmidt. A Taxonomy of Community-based Medical Education. Acad. Med. 2000;75:699–707.

- 7. Portfolio-based learning:** Portfolio<sup>6,8,7</sup> is collection of products collected by the student that provides evidence of learning and achievements related to a learning plan. Portfolio develops self-directed learning and reflective ability. It provides personal and professional educational evidence for student learning, contextualizes learning, links experience with personal interpretation, enhances interactions between students and teachers, allows students to receive feedback, stimulates the use of reflective strategies and expands understanding of professional competence. The basic structure of the portfolio may include a title page (giving student's name, year of training and name of the mentor), contents page (listing what is in the portfolio with page references), a list of learning objectives (whose achievement the evidence in the portfolio claims to demonstrate), a short reflective overview (summarizing the learning that has taken place since the last portfolio review, and indicating which items of evidence relate to which learning objectives) and the evidence itself (probably grouped together into the areas contained in the learning objectives. Mentoring is crucial for portfolio-based learning, as it enhances the feedback process and stimulates students' reflections. Students will have individual mentors (preferably with same background) from first year and will stay with one mentor until the point of graduation. The aims of the mentoring are to provide feedback, stimulate reflection, support students in compiling portfolio, monitor students' competency development, support students in developing a better awareness and understanding of their strengths and weaknesses, support students in drawing up a learning plan for the coming period and motivate/inspire students, The Mentor will evaluate portfolio of the students at least two times a year and hold discussion to provide feedback.
- 8. Personal research and reflection exercise:** In this methodology the student selects content area from list of topics provided (e.g., examine the impact of culture on the delivery of health care) then use journals, self- reflection, community-based research, clinical experiences, discussions etc., and is expected to present the findings (in writing and /or orally). This will help the student apply literature review, self-reflection and critical thinking as a method of professional exploration and growth to enhance their research and communication skill and deepen and broaden their knowledge.

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<sup>6</sup> ACGME and ABMS. Toolbox of assessment methods. A product of the joint initiative of the ACGME Outcome Project of the Accreditation Council for Graduate Medical Education (ACGME), and the American Board of Medical Specialties (ABMS). Version 1.1, September 2000. <sup>8</sup>M. Friedman ben david, m.h. Davis, r.m. Harden, p.w. Howie , j. Ker &m.j. Pippard. Ameer medical education guide no. 24: portfolios as a method of student assessment. Medical teacher, vol. 23, no. 6, 2001

<sup>7</sup> hankedekker, erikdriessen, edithterbraak, feddescheele, jorisslaets, thys van der molen&jankecohen-schotanus. Mentoring portfolio use in undergraduate and postgraduate medical education. Medical teacher 2009; 31: 903–909

**9. Whole group session:** During years 1 to 4, all students and faculty will meet on Friday afternoon for whole group session. The purpose of the session is to consolidate and reflect on the different learning activities covered during the week. The session is student-centered discussion that will be facilitated by one or more faculty.

**10. Journal club:** A journal club<sup>8</sup> is a group of individuals who meet regularly to discuss the clinical applicability of articles in current nursing related journals. Journal club is an increasingly popular way to promote the uptake of research evidence into practice. To make it effective, evidence suggests mentoring and brief training of students on how to judge quality of research as well as the use of structured critical appraisal instrument. Journal club is suggested to be implemented during autonomous nursing practice after students have completed research methods module.

**11. Case based discussion (CBD)**

This type of performance assessment focuses on evaluating the clinical reasoning of trainees so as to understand the rationale behind decisions made in authentic clinical practice. As with other assessment methods described, each encounter is expected to last no more than 20 minutes, including 5 minutes of feedback. Trainees are expected to engage in multiple encounters with multiple different examiners during the training period.

## Quality Improvement, Monitoring and Evaluation

Higher institutions delivering this program have already established a health sciences education development center (HSEDC) to lead and coordinate quality assurance and program monitoring and evaluation. Quality assurance will be guided and monitored by program specific educational standards and benchmarks defined by the Higher Education Relevance and Quality Agency. The ongoing quality of the comprehensive nursing education will be monitored and ensured through:

- Engagement and capacity building of the curriculum committee under the HSEDC to oversee the implementation of the curriculum develop standard guidelines for teaching and assessment and make necessary adjustments along the way.
- Establishment of PBL coordinating committee under the HSEDC that will be tasked with designing, revising and storage of PBL cases

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<sup>8</sup> harris j, kearley k, heneghan c, meats e, katherinekearley-shiers, niaroberts, pererar. Are journal clubs effective in supporting evidence-based decision making? A systematic review. Beme report. November 2009.

- Gaining leadership buy-in to mobilize time and human resources and establish the infrastructure needed, such as syndicate rooms for PBL tutorials
- Self-review of the educational inputs, processes and outputs (including human resources physical infrastructure, teaching/learning in classroom, skills lab, clinical and community settings, student assessment, management and governance and student performance results) semi-annually and taking action. This will be coordinated by the quality assurance committee or team.
- Organizing regular faculty development and support programs on instructional methods, technical updates, research, leadership, etc. This will be coordinated by the faculty development committee or team.
- Establishment of an assessment committee or team under the HSEDC to develop and maintain exam banks and coordinate, review and administer student assessment practices
- Evaluation of teaching effectiveness by systematic collection of feedback from students and at the end of each module or attachment and use it for program improvement
- Peer and module/rotation evaluation by instructors at the end of module delivery
- Annual assessment of the program by the teaching staff
- Exit interviews at graduation and for all those who drop out for any reason
- Monitoring students' pass rate in national qualification (pre-licensure) exam and comparing it with other nursing schools
- Establishing alumni of graduates as a mechanism to assess their career choice and development
- Evaluation of graduates' performance including obtaining feedback from employers and society and use the information for program improvement
- Review and amendment of the curriculum implementation every year and overall evaluation of its effectiveness at some point in time (5-6 years after the launch of the program) to be led by the curriculum committee under the HSEDC.

### **Assessment Methods**

Assessment plays a central role in education process: it determines much of the work students undertake affects their approach to learning and is an indication of which aspects of the course are valued most highly. The purposes of assessment are to motivate students to learn, create learning opportunities, to give feedback to students and teachers, grading and quality assurance. There is a distinction between a formative assessment, which is mainly intended to help the student learn and a Summative assessment, which is intended to identify how much has been

learned. Formative assessment is most useful part way through the module and will involve giving students feedback which they can use to improve future performance. Faculty should conduct at least two formative assessments of each student during a given module or rotation. Summative assessment is used to make a pass/fail or, promotion decision; findings of formative assessment are not used to make pass/fail decisions, however<sup>9</sup>. That being said both formative and summative assessments are equally important; however, psychometric rigor is required more from summative assessment strategies. The following principles<sup>10,11</sup> are considered in selection of assessment strategies and faculty should keep in mind these principles in appraising and revising assessment methods during implementation. Validity and reliability are of utmost importance but it is also recommended to consider feasibility and cost.

**Reliability:** Reliability is the reproducibility or consistency or generalizes ability of assessment scores. An assessment result is said to be reliable if students will get the same score if they re-take the exam. Similarly, for essay type and performance assessment, assessment scores are reliable, if the same results are obtained with different raters. Reliability of assessments can be improved by increasing the number of questions (or cases in clinical performance examination), aiming for middle difficulty questions, writing clear and unambiguous questions and increasing the number of raters.

**Validity:** Validity is the ability of an assessment to measure what it is supposed to measure. Validity is not about the method refers to the evidence presented to support or refute the meaning or interpretation assigned to assessment results. Simply put, assessment results are valid if they accurately distinguish competent from incompetent students and if the student who gets “A” grade is actually an “A” student, a student who gets a “B” grade is actually a “B” student, a student who gets an “F” grade is actually an “F” student, etc. Examples of factors that affect validity in written assessment are too few written questions to sample the content adequately, preparing questions from some chapters, mismatch of assessment questions with content covered in the curriculum, poorly constructed questions, too difficult or too easy questions, rater subjectivity and cheating. For performance (clinical) assessment, too few cases or observations to generalize performance, unrepresentative cases, rater bias, flawed rating scales/checklists and indefensible pass/fail cut off points are threats to validity.

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<sup>9</sup> Chris Rust. Learning and Teaching Briefing Papers Series: Purposes and Principles of Assessment. Oxford Centre for Staff and learning Development. 2002

<sup>10</sup> Steven M Downing & Thomas M Haladyna. Validity threats: overcoming interference with proposed interpretations of assessment data.

Medical Education 2004; 38: 327–333

<sup>11</sup> Steven M Downing. Reliability: on the reproducibility of assessment data. Medical Education 2004; 38: 1006–1012

Note that reliability is a necessary but not sufficient condition for validity.

### Assessment blueprint

Developing assessment blueprint helps to improve validity of a test through creating a match between the curriculum and the assessment methods: Blueprinting means the identification of “what” has to be assessed in terms of the key topics of knowledge, essential skills and desirable attitudes, in relation to both the educational program objectives and the outcomes expected for those passing through it [Boulet, J. and Raymond, M. 2015]. In other words, any assessment methods must match with the competencies being learnt and all tests should be checked to ensure that they are appropriate for the objective being tested [Wass, 2001].

The Miller’s pyramid of competence depicted below (fig.2) provides an excellent framework within which validity of an assessment can be ensured. The use of multiple-choice questions (MCQ) to assess factual knowledge (the “knows”), application of knowledge (“knows how”), the use of OSCE to assess clinical skills (“shows how”) and the use of DOPs to assess performance at workplace (“does”) may provide initial evidence of validity [Norcini,J. and Troncon,L. 2015]. On the contrary, the use of essays to assess clinical competence would hardly be associated with the production of evidence of validity, as this method would cover only the cognitive aspects of clinical competence, such as clinical reasoning, but not the behavioral aspects usually involved in clinical encounters.

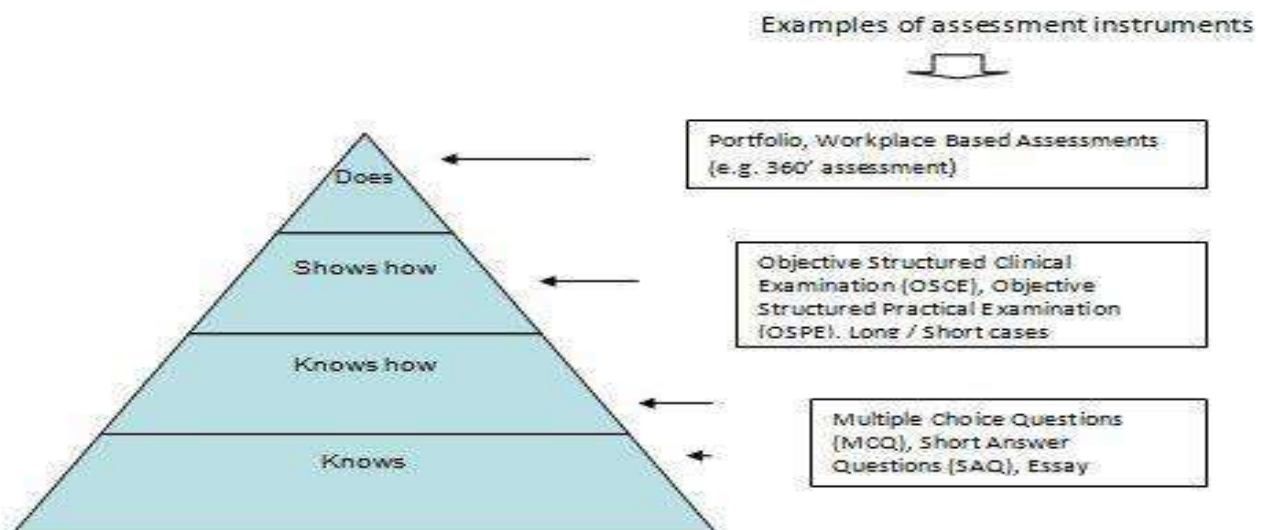


Fig.2: Miller’s pyramid of competence

Feasibility and acceptability of the assessment methods are also important aspect worth considering. No matter how valid and reliable the method is, it is the feasibility of that determine the method to be chosen [van der Vleuten, & Schuwirth, 2005]. Feasibility is the degree to which the assessment method

selected is affordable and efficient for the testing purpose; assessments need to have reasonable costs. Acceptability is the extent to which stakeholders in the process (e.g., medical students and faculty, practicing physicians, patients) endorse the measure and the associated interpretation of scores [Norcini and McKinley, 2007].

These are the descriptions of the major assessment methods including when and where they would be used in the curriculum.

### 1. Direct observation of clinical skills (DOCs)

The purpose of DOCs or mini-clinical evaluation exercise<sup>12</sup> is to assess clinical skills while a student interacts with patients in different settings. Typically, it takes 15-20 minutes and the assessor follows the student with a checklist and gives feedback at the end. The DOCs offer students immediate and ongoing feedback about their observed clinical skill and performance (interviewing skills, physical examination skills, and professionalism, clinical judgment, counseling skills, organization/efficiency and overall clinical competence). This method will be used in all years of the training and there will be at least **two DOCs** to be performed by a student in each module or clinical rotation. This assessment method enables one to follow the progress of the student and will be used for **formative assessment**.

### 2. Objective structured clinical examination (OSCE)

Objective structured clinical examination (OSCE) is a performance-based exam. During the exam, students are observed and evaluated as they go through a series of 8 or more stations. It allows assessment of multiple competencies. It is **Objective**, because examiners use a checklist for evaluating the trainees; **structured**, because every student sees the same problem and performs the same tasks in the same time frame; **Clinical**, because the tasks are representative of those faced in real clinical situations. These increase the reliability and validity of the assessment. OSCE<sup>13</sup> is a standardized means to assess history taking, physical examination skill, communication skills, ability to summarize and document findings, ability to make a differential diagnosis or plan treatment, clinical judgment based on patient 's note and procedural skills. OSCE may use manikins and simulators, standardized patients and real patients. Standardized patients are healthy persons trained to simulate a medical condition in a standardized way. Health science students, health facility staff and faculty may serve as

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<sup>12</sup> John J. Norcini; Linda L. Blank; F. Daniel Duffy; and Gregory S. Fortna. The Mini-CEX: A Method for Assessing Clinical Skills. *Ann Intern Med.* 2003;138:476-481.

<sup>13</sup> ACGME and ABMS. Toolbox of assessment methods. A product of the joint initiative of the ACGME Outcome Project of the Accreditation Council for Graduate Medical Education (ACGME), and the American Board of Medical Specialties (ABMS). Version 1.1, September 2000.

standardized patients. Objective structured practical exam (OSPE) is a variant of OSCE to assess students' knowledge and skill in a non-clinical setting. Both OSCE/OSPE will be part of the summative assessment and will be implemented from year 1-4 in the comprehensive nursing program.

### 3. Structured long cases

Structured long case assessment presents the student with a complete and realistic clinical challenge thereby enabling the evaluator to see the complete picture of the student's ability in addressing the challenges. The use of multiple cases improves reliability of the examination, which is a major weakness in the traditional long case. Additional improvements to the traditional long case that would improve reliability are observing the student-patient interaction and using checklist and increasing the number of examiners<sup>14</sup>. Because of feasibility considerations, structured long cases will be used only during year IV as part of the **summative assessment** of the student.

### 4. Standardized oral exam

The standardized oral examination<sup>15</sup> is a type of performance assessment using realistic patient cases for questioning the examinee. The examiner begins by presenting to the examinee a clinical problem in the form of a patient case scenario and asks the examinee to manage the case. Questions probe the reasoning for requesting clinical findings, interpretation of findings, and treatment plans. In efficiently designed exams each case scenario takes three to five minutes. One or two faculty serve as examiners and students can be tested on several different clinical cases. Oral exam will be part of the **summative assessment** in year IV.

### 5. Written exam

Written assessments may include different item formats such as multiple choice questions, matching, true-false, essay and short answer. Written assessment methods will help to evaluate knowledge and understanding of basic, clinical, public health and psychosocial sciences and professionalism and ethics. Important point to remember is to ensure written exams assess higher order knowledge in addition to recall and comprehension. Written assessments would be parts of both as **formative and summative assessment** in all years of the comprehensive nursing program.

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<sup>14</sup> John Norcini. The death of the long case? *BMJ* 2002;324:408-9

<sup>15</sup> ACGME and ABMS. Toolbox of assessment methods. A product of the joint initiative of the ACGME Outcome Project of the Accreditation Council for Graduate Medical Education (ACGME), and the American Board of Medical Specialties (ABMS). Version 1.1, September 2000.



## 6. Logbook

**Logbook** documentation serves as evidence of scope of patient care and community experience to meet requirements or specific learning outcomes. Maintaining logbook will encourage students to make use of all possible learning opportunities for clinical/procedural skills and community skills to fulfill minimum requirement. Regular review of logbook can be used to help the student track what procedures or experiences must be sought to meet requirements. The logbook document should be counter signed by faculty. The number reported in a logbook may not necessarily indicate competence. Logbook will be part of the **formative assessment** throughout the comprehensive nursing curriculum.

## 7. Portfolio

Portfolio<sup>16</sup> is collection of papers and other forms of evidence that learning has taken place. It provides evidence for learning and progress towards learning objectives. Reflecting upon what has been learned is an important part of constructing portfolio. In addition to products of learning, the portfolio can include statement about what has been learnt, its application, remaining learning need, how they can be met. Portfolio helps to assess learning outcomes including those that are not easy to assess with other methods like personal growth, selfdirected learning, reflective ability, self-assessment of personal growth and professionalism. Portfolio allows assessment of progress towards learning outcomes by using chronological work samples collected at different points in time. Portfolio will be part of the **formative** assessment throughout the duration of the ECCN training and can be used as a **summative assessment** during professional comprehensive nursing practice.

## 8. Global Rating

Global Rating<sup>17</sup> is assessment of general categories of ability (e.g. patient care skill, medical knowledge, interpersonal and communication skills, professionalism, etc.) retrospectively based on general impression over a period of time and derived from multiple source of information. The purpose is to evaluate knowledge, skill and attitude over a period of time at the end of a rotation thereby helping the evaluation of the student's effort across time. Global rating will be part of both formative and summative assessment of students throughout the duration of the comprehensive nursing curriculum.

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<sup>16</sup> M. Friedman ben david, m.h. Davis, r.m. Harden, p.w. Howie , j. Ker &m.j. Pippard. Amee medical education guide no. 24: portfolios as a method of student assessment. Medical teacher, vol. 23, no. 6, 2001

<sup>17</sup> Acgme and Abms. Toolbox of assessment methods. A product of the joint initiative of the acgme outcome project of the accreditation council for graduate medical education (acgme), and the american board of medical specialties (abms). Version 1.1, september 2000.

## 9. 360<sup>0</sup> Evaluation

3600 evaluations<sup>18</sup> consists of measurement tools completed by multiple people in a student's sphere of influence. Evaluators usually are faculty, other members of the health care team, peers, patients and others as needed. 360 evaluations can be used to assess interpersonal and communication skills, teamwork ability, management skills, decision-making professional behaviors and some aspects of patient care. It will be used as part of the **summative assessment** in team training program (TTP), and in some nursing modules as indicated.

## 10. PBL progressive assessment

PBL<sup>19</sup> progressive assessment is a continuous assessment of students' performance during PBL tutorials with regards to content, process and professionalism. To improve reliability of the score, this assessment strategy will be guided by a checklist. The checklist may assess competencies in four areas: knowledge of basic, clinical, public health and psychosocial sciences, information gathering skills, reasoning skills, participation and communication skills, and cooperation and team building skills. This assessment method will be part of both formative and summative assessment during year I to IV. PBL tutorial assessment at the end of each session and midway during a module will be used as a formative assessment method while end of module assessment of students' performance during PBL tutorials will be used as part of the summative assessment.

## 11. Clinical encounter cards (CEC)

The basic purpose of this formative assessment strategy is also to score trainee performance based on direct observation of a patient encounter. The encounter card system scores the following dimensions of observed clinical practice: history-taking, physical examination, professional behavior, technical skill, case presentation, problem formulation (diagnosis) and problem solving (therapy). Each dimension is scored using a 6-point rating scale describing performance as 1: unsatisfactory, 2: below the expected level of student performance, 3: at the expected level of student performance, 4: above the expected level of student performance, 5: outstanding student performance, and 6: performance at the level of a medical graduate.

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<sup>18</sup> Acgme and Abms. Toolbox of assessment methods. A product of the joint initiative of the acgme outcome project of the accreditation council for graduate medical education (acgme), and the american board of medical specialties (abms). Version 1.1, september 2000.

<sup>19</sup> Division of Educational Development & Research, Teacher & Educational Development, University of New Mexico School of Medicine. Faculty and student guide to PBL tutorials in phase I curriculum of the University of New Mexico School of Medicine. 2002.

## **12. Clinical work sampling (CWS)**

This formative assessment method is based on direct observation of clinical performance in the workplace. The method requires collection of data concerning specific patient encounters for a number of different domains either at the time of admission (admission rating form) or during the hospital stay (ward rating form). These forms are completed by faculty members directly observing trainee performance. The domains assessed by faculty include: communication skills, physical examination skills, nursing diagnostic acumen, consultation skills, management skills, interpersonal behavior, continued learning skills and health advocacy skills. Trainees are also assessed by ward nursing staff (using the multidisciplinary team rating form) and the patients (using the patient rating form) who are in the care of the trainees. These rating forms, also completed on the basis of directly observed behavior, require a global assessment and ratings of the following domains: therapeutic strategies, communications skills, consultation with other health care professionals, management of resources, discharge planning, interpersonal relations, collaboration skills, and health advocacy skills and professionalism.

## **13. Mini-clinical evaluation exercise (mini-CEX)**

Trainees perform clinical tasks, such as taking a focused history or performing relevant aspects of the physical examination, after which they provide a summary of the patient encounter along with next steps (e.g., a clinical diagnosis and a management plan). These encounters can take place in a variety of workplace settings including inpatient, outpatient, and emergency departments. Patients presenting for the first time as well as those returning for follow up visits are suitable encounters for the mini-CEX. Not surprisingly, the method lends itself to a wide range of clinical problems including: (1) presenting complaints such as chest pain, shortness of breath, abdominal pain, cough, dizziness, low back pain; or (2) clinical problems such as arthritis, chronic obstructive airways disease, angina, hypertension and diabetes mellitus. It can be used as a summative assessment during professional comprehensive nursing practice.

## **14. Blinded patient encounters**

Students, in groups of 4–5, participate in a bedside tutorial. It starts with a period of direct observation in which one of the students in the group is observed performing a focused interview or physical examination as instructed by the clinician educator conducting the teaching session. Thereafter the student is expected to provide a diagnosis, including a differential diagnosis, based on the clinical findings. The patient is unknown to the student, hence the term ‘blinded’ patient encounter. This type of patient encounter has the advantage of safely allowing the trainee to practice information gathering, hypothesis generation, and

problem-solving skills. This can be used as a summative assessment during professional comprehensive nursing practice.

N. B. Each course/modules have their own assessment methods along with test weight

## Grading system

Letter grades shall be given based on the points earned out of 100. The letter grading system has a fixed scale as described in the table below.

Raw mark interval [100%]	Corresponding fixed number grade	Corresponding letter grade	Status Description	Class description
[90, 100]	4.0	A+	Excellent	First class with great distinction
[85, 89]	4.0	A	Excellent	First class with great distinction
[80, 84]	3.75	A <sup>-</sup>	Excellent	First class with great distinction
[75, 79]	3.5	B+	Very good	First class with distinction
[70, 74]	3.0	B	Very good	First class with distinction
[65, 69]	2.75	B <sup>-</sup>	Good	First class
[60, 64]	2.5	C+	Good	Second class
[50, 59]	2.0	C	Satisfactory	Second class
[45, 54]	1.75	C <sup>-</sup>	Unsatisfactory	Lower class
[40, 44]	1.0	D	Very poor	Lower class
[<40]	0	F	Fail	Lowest class

## Promotion requirements

- Students are required to achieve a passing mark of C (50%) in knowledge based and C+ (60%) in performance assessments that will be conducted before their transition from one core modules to another core module and transition to internship program (pre-internship assessment) respectively.
- Any student scoring below 60% in core modules having hospital or community based clinical practice assessment should repeat the module.
- A student who scores C- or D in overall modular assessment of core modules will be allowed to take the next module/s while concurrently repeating the modules he/she scored C- or D.
- A failure (F) in the performance of the second attachment would suffice to delay the student by one year.
- Any student scoring below 50% in core modules in school-based assessment, including written exam, simulation-based assessment and PBL progressive assessment should take reexam in two weeks' period.
- Achieving at least 50% in overall school-based assessment is a requirement to join the modules' clinical practice.
- A student who scores C<sup>-</sup> in supportive and common courses could progress to take the next modules/semester/year given that his/her cumulative GPA is in acceptable range.
- A student who scores D in supportive course should take re-exam although he/she may have GPA of 2.0 or more. But for common courses, scoring D does not prohibit students to progress to the next level given that his/her GPA is unacceptable range (as specified for 1<sup>st</sup> and 2<sup>nd</sup> year in the table above).
- A student with F in any of the modules/ courses must repeat the course/module as long as his/her cumulative GPA is unacceptable range.
- A student should pass the pre-internship exam to attach the internships.
- A student should pass the comprehensive examination to take the national licensure examination.

## Probation and Dismissal

- As per harmonized senate legislation

## Graduation Requirement

- Students are required to achieve a passing mark of C (50%) in knowledge based and C+ (60%) in performance assessments in core/ major modules and comprehensive exit exams to qualify for graduation respectively.

- A student cannot graduate with a grade point average (GPA) of less than 2.0 out of the 4scale grading system. That being said however, he/she should at least score a minimum of C+ (>60%) and above for all major modules and C (≥50%) for supportive courses (SPH) to be eligible for graduation.

## Degree Nomenclature

Upon successful completion of the four years program, the graduate will be awarded the degree of ‘Bachelor of Science in Comprehensive Nursing’ and in Amharic ‘የሳይንስ ባችለር ዲግሪ በአጠቃላይ ነርስነት’

## Module syllabus

### Year I

### COURSE TITLE: Communicative English I Skills Course Syllabus

**Module Name:** Communicative English Skills Course Syllabus

**Program:** BSc Nursing

**Course Title:** Communicative English Skills

**Course Code:** EnLa1021

**Degree Program:** BSc in Nursing

**ECTS:** 5

**Target group:** First Year BSc. nursing Students

**Year:** I

**Pre-requisite:** None Course

**Duration:**

**Status of the Course:** General

**Course Description:** It is obvious that English is a medium of instruction in higher institutions of Ethiopia. Besides, it is also a widely used language around the world, and has become the language of communication at different levels and forms. Thus, this course is intended to develop and improve students' language competence. To this end, this course gives students a chance to improve the major language skills namely reading, speaking, listening and writing. It also enables them to develop their vocabulary and grammar awareness. Hence, this course is aimed at developing trainees' communicative abilities in English which will help students to develop their communicative skills and oral language competence in English. Generally, this course will cover the specific language aspects described below.

Developing basic functions of English language skills: reading (scanning, skimming, reading for details, summarizing, understanding the structure of a text); listening (listening for the gist, listening for details, recognizing discourse markers, noticing the structure of a lecture, understanding speaker intentions, recognizing signposting, attending and following skills); writing (summarizing a text, synthesizing choppy sentences, writing argumentative texts, writing research report, writing a project report); speaking (introducing oneself and others, interviewing, discussions, stating and supporting propositions, stating one's opinions, organizing and taking part in a debate, making a persuasive speech, questioning); vocabulary (working out meanings from context, synonyms, antonyms, collocations, definitions); grammar (relative clauses, modals, voice, conditionals, tense, reported speech).

### Course Objectives

- After the completion of this course, trainees will be able to:
- Express their ideas in various communicative contexts (in group/ pair discussion, in public speaking settings)
- Present oral reports
- Write short reports
- Read various materials and make their own notes
- Identify the structure of oral and written discourses
- Attend their academic work at ease and with clarity

### Course Details

- **Duration =14 weeks**
- **Total hrs./week = 7 hrs./week for 14 weeks**
- **Lecture and discussion=4hrs.**

□ **Self-study 3hrs/week**

<b>Weeks</b>	<b>Lecture hrs</b>	<b>study hrs</b>	<b>Main Topic/Sub topic/s/ Chapter</b>	<b>Reading material/assignments</b>	<b>Remarks</b>
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	<b>4hrs</b>	<b>10hrs</b>	<b>1.Introductory Unit</b> <b>1.1. Listening and Speaking</b> 1.1.1. Finding out about other people <b>1.2. Vocabulary</b> 1.2.1. Learning to learn vocabulary <b>1.3. Grammar</b> 1.3.1. Learning to use grammar for facilitating	Course outline College English VL.I PP 4-10  English Communicative Grammar pp 34-48  College English VL. I	
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	<b>3hrs</b>	3hrs 1hr	meaning <b>1.4. Reading</b> 1.4.1. What is involved in understanding text? <b>1.5. Speaking</b> 1.5.1. Introducing oneself and others <b>1.6. Writing</b> 1.6.1. A short Personal description or story	Communicative English Skills Unpublished  Writer's Choice	
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	2hrs	24 hrs	<b>2.AIDS</b> <b>2.1. Listening and Speaking</b>	College English- Teacher's Guide	
		4hrs	2.1.1. Understanding markers of addition and relating 2.1.2. Listening for gist 2.1.3. Responding to the speaker's purpose 2.1.4. Writing a brief summary of a talk	College Reading + McCarthy	
	2hrs	4hrs	<b>2.2. Vocabulary</b> 2.2.1. Using component parts of a word as clues to meaning 2.2.2. Using topic relationships in order to learn words 2.2.3. Being aware of how words collocate with each other 2.2.4. Working out word meanings from context	Advanced Grammar in Use + Grammar for English Language Teachers 350-79  College English VL. I	
	6hrs	3hrs	<b>2.3. Grammar</b> 2.3.1. Using relative clauses 2.3.2. Expressing warning and advice	College English VL. I College English VL. I + Public Speaking for College and Career	
	2hrs	3hrs	<b>2.4 Reading</b> 2.4.1. Identifying the intended audience of a text and other critical reading skills	College English VL.I	
		8hrs	2.4.2. Relating a diagram to a text		

			summary of a talk		
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	3hrs	25hrs	<b>3.Culture and Values</b>	
		3hrs	<b>3.1. Listening and Speaking</b> 3.1.1. Identifying the structure of a talk 3.1.2. Completing a note framework	College English-Teacher's Guide College English VL.I
	2hrs	3hrs	<b>3.2. Vocabulary</b> 3.2.1. Using topic relationships to learn new words 3.2.2. Words of Greek and Latin origin 3.2.3. Using a vocabulary network to learn words	Grammar for English Language Teachers p287
		3hrs	<b>3.3. Grammar</b> 3.3.1. Using active and passive constructions for descriptive writing 3.3.2. using time clauses for descriptive writing	College English VL. I Public Speaking for College and Career
	5hrs	3hrs	<b>3.4. Reading</b> 3.4.1. Critical reading 3.4.2. Reading for main ideas 3.4.3. Reading for detail	Writer's Choice + Essentials of Writing
		10hrs	<b>3.5. Speaking</b> 3.5.1. Understanding reference 3.5.2. Brainstorming 3.5.3. Organizing and taking part in a debate	
		3hrs	<b>3.6. Writing</b> 3.6.1. Writing a brief summary of key ideas from a text 3.6.2. Writing a descriptive essay about a marriage ceremony	
	2hrs	15hrs	<b>4.Improving Study Practices</b>	
		2hrs	<b>4.1. Listening and speaking</b>	College English-Teacher's Guide

			<p>4.1.1. Thinking about what you do when you listen to a lecture and take notes</p> <p>4.1.2. Understanding listing and sequencing markers</p> <p>4.1.3. Listening for a main sections of a talk</p> <p><b>4.2. Vocabulary</b></p> <p>4.2.1. Using a dictionary</p> <p>4.2.2. Working out word meanings from context</p> <p><b>4.3. Grammar</b></p> <p>4.3.1. Using Conditional I, II and III</p> <p><b>4.4. Reading</b></p> <p>4.4.1. Skimming for gist</p> <p>4.4.2. Critical reading and evaluating</p> <p>4.4.3. Using reference/textual markers</p> <p><b>4.5. Speaking</b></p> <p>4.5.1. Brainstorming and discussing on what makes a good learner</p> <p><b>Writing</b></p> <p>4.6.1. Summarizing a talk</p> <p>4.6.2. Summarizing an academic article</p> <p>4.6.3. Writing an essay on learning English</p>	<p>College Reading + Objective English</p> <p>Grammar for English Language Teachers p231 + College English</p> <p>College English VL. I</p> <p>College English VL. I</p> <p>Writer's Choice</p>	
	<p><b>2hrs</b></p> <p><b>3hrs</b></p>	<p>2hrs</p> <p>3hrs</p> <p>3hrs</p> <p>2hrs</p> <p>3hrs</p>			
	<p><b>3hrs</b></p> <p><b>2hrs</b></p> <p><b>4hrs</b></p> <p><b>3hrs</b></p>	<p><b>13hrs</b></p> <p>2hrs</p> <p>3hrs</p> <p>2hrs</p> <p>2hrs</p>	<p>5.</p> <p><b>5.1 Listening and Speaking</b></p> <p>5.1.1. Noticing the structure of lectures,</p> <p>5.1.2. responding to lectures</p> <p><b>5.2 Vocabulary</b></p> <p>5.2.1. Working out meanings of core words related to <b>Theme I</b> from context</p> <p><b>5.3. Grammar</b></p> <p>5.3.1. Reporting clauses</p> <p><b>5.4. Reading</b></p> <p>5.4.1. Interpreting tables and figure</p> <p><b>5.5. Speaking</b></p> <p>5.5.1. Discussions and interviews</p> <p><b>5.6. Writing</b></p>	<p>College English VL. II</p> <p>College Reading + McCarthy</p> <p>College English VL. II</p> <p>College English VL. II</p> <p>College English VL. II</p>	

		2hrs			
		2hrs	5.6.1 Assessing problems and proposing solutions Final Exam		

**Course delivery mode/Methodology:**

In delivering this course, a variety of teaching and learning methodologies (approaches) will be employed. There will be: Gapped lecture, students’ presentation, Pair/ group work, Questioning and answering, Dictation, personal interactions among students and instructors, involving students in public speaking in a role play form, debate, group discussions and other confidence building sessions are required. Thus, to the end of delivering this course, students will be given home study assignments, reading assignment, class works, writing assignments and group work assignments to prepare for contextual public speaking hoping to boast their oral/aural skills and to involve them in debates to enhance their persuading skill too. Therefore, to successfully deliver this course, it needs an organized arm both from students and instructors.

**Assessment Mechanisms:**

Students will be assessed out of 100% in this course. Of which 60% will be allotted for the Continuous Assessment (CA) that will be done throughout the semester. The remaining 40 % will be for the final examination. The CA includes varied types of activities that will allow the students to express themselves like real speaker or communicator. Thus, Students will be assessed continuously at least once in each of the six components. A final exam is administered to assess students. Breakdown of the assessment can be seen bellow:

**Continuous Assessment**

Debates	10%
Speech Delivery (2) (Impromptu & Prepared)	(5□2) 10%
Group Assignment	10%
Report (Oral & Written)	10%
Summary & Review	10%
Listening	10%
Final Examination	40%
100%	

**References**

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## **COURSE TITLE: COMMUNICATIVE ENGLISH IIWRITING ENGLISH SKILL**

### **COURSE CODE: FLEn 1012 Course Description**

This course is intended to develop and improve students' language competence. Generally, this course will cover the specific language aspects described below.

**Writing** (summarizing a text, writing descriptive texts)

**Vocabulary** (working out meanings from context, synonyms, antonyms, collocations, definitions);

**Grammar** (relative clauses, modals, voice, conditionals, tense, reported speech).

### **Course objectives**

Upon completing the course, students will be able to:

- Compose well organized paragraph of the different type
- Compose well organized essay
- Use various vocabulary learning strategies and techniques
- Write and present reports
- Read various materials and make their own notes
- Identify the structure of written discourses
- Attend their academic work at ease and with clarity.

Week	Main Topic/Sub topic/s/ Chapter	Student Activities
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1 <sup>st</sup> &2 <sup>nd</sup>	<p><b>Grammar:</b> Learning to use grammar for facilitating meaning Using relative clauses using active and passive constructions for descriptive writing using conditional sentences Writing: Writing a short text that narrates one aspect of cultural practices Definition of a paragraph Components of a paragraph Characteristics of a good paragraph Basic types of paragraphs Techniques of paragraph development Writing a paragraph Vocabulary Guessing contextual meanings of words</p>	-write a story on cultural practices
3 <sup>rd</sup> &4 <sup>th</sup>	<p>Writing Effective Essay Introduction The Body Summary</p>	-write descriptive texts -Write a short essay
5 <sup>th</sup> & 6 <sup>th</sup>	<p><b>Writing</b> Developing various texts about campus students health problems Describing products using passive and active voices</p>	-write a paragraph that shows cause-effect
7 <sup>th</sup>	<p><b>Writing</b> Write an expository and descriptive paragraph</p>	Write an expository and descriptive paragraph
8 <sup>th</sup> and 9 <sup>th</sup>	<p><b>Writing</b> Writing argumentative Paragraph <b>Grammar:</b> Reported speech</p>	-write argumentative paragraph Use reported speech in writing
10 <sup>th</sup> & 11 <sup>th</sup>	<p>Letter Writing</p> <ul style="list-style-type: none"> <li>• Introduction to Letter Writing</li> <li>• Planning a Letter</li> <li>• Types of Letters</li> <li>• Personal or Informal Letters</li> <li>• Business or Formal letters</li> <li>• Four Considerations of a Business Letter</li> <li>• Tutorial based on questions prepared on</li> <li>• Reflection/self-assessment checklist</li> </ul>	

12 <sup>th</sup> and 13 <sup>th</sup>	<b>Reading:</b> <ul style="list-style-type: none"> <li>❖ Understanding writer's style</li> <li>❖ Reacting to a text</li> <li>❖ Understanding meanings of words from context</li> <li>❖ <b>Writing:</b></li> <li>❖ Writing narrative paragraph</li> </ul>	-Practice understanding writers' style and reacting to a text -use contexts to understand meanings of words -Write narrative paragraphs
14 <sup>th</sup> & 15 <sup>th</sup> wk	<b>Writing</b> summarize, paraphrase or quote texts correctly;	summarize, paraphrase or quote texts correctly;
<b>Teaching methods</b>	Classroom contact/Lecture, group work, interactive tutorial sessions (group and pair work/discussions and individual work (independent learning)).	
Course policy	<p><b>Attendance:</b> It is compulsory to come to class on time and every time. If you are going to miss more than three classes during the term, you should not take this course.</p> <p><b>Assignments:</b> you must do your assignment on time. No late assignment will be accepted.</p> <p><b>Tests/Quizzes:</b> you will have short quizzes and tests almost every week. If you miss the class or, are late to class, you will miss the quiz or test. No makeup tests or quizzes will be given. You are expected to observe the rules and the regulations of the University as well.</p> <p><b>Cheating/plagiarism:</b> you must do your own work and not copy and get answers from someone else. The only way to learn English is to do the work yourself.</p> <p>Also, please do not chew gum, eat, listen to recorders or CD players, wear sunglasses, or talk about personal problems. Please be sure to turn off pagers and cell phones before class and exam sessions</p>	

**Assessment ❖ Continuous Assessment**

**50%**

❖ Reading and Vocabulary-test	10%
❖ Writing assignments	30%
❖ Grammar-test	10%
❖ Final Examination (50%)	

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## COURSE TITLE: MORAL AND CIVICS

Course Title	<b>Introduction to Civics and Ethics</b>					
Course Code	<b>CESt1012</b>					
Credit Hours	<b>2 Cr.Hrs (3 ECTS)</b>					
Status of Course	<b>Compulsory Common Course</b>					
Student Work Load	Lectures	Tutorial	Library and	Assign	Home	Total
	32 hr		Group Work	Report	Study	W. L.
<b>Course Description</b>	<p>This course is designed for undergraduate students with the aim of producing good citizens. It emphasizes on equipping learners with the necessary civic competence and active participation in public life. It will also help them to exercise their democratic rights and discharging their responsibilities effectively by familiarizing them with necessary civic knowledge and skills. In countries such as ours, where the process of cultivating modern constitutional and democratic values in the minds of citizens is experiencing serious challenges, largely because the country had no established civic culture and partly because these values and principles are not yet well institutionalized, civics and ethical education remains to be imperative. To this end, the course introduces learners to the basics of civics and ethics, citizenship, morality and the goals of studying civics and ethics. It exposes students to the meanings, foundations, approaches, values and principles of ethics and civic virtue that learners must be equipped with both as citizens and professionals in their encounter with real life situations both to be morally matured and responsible while making decisions and taking actions. The course also elucidate the nature, purpose and forms of state and government, constitution, democracy and human rights, the nature of democratic citizenship, modes of cultivating civic-virtues in our citizens mainly within the context of Ethiopia.</p>					



<p style="text-align: center;"><b>Course Purpose</b></p>	<p>Ethiopia is currently going through a twin process of hope and despair. On the one hand there are tremendous social, economic and political changes. On the other hand, significant challenges are affecting the process, the pace and magnitude of this change. For such changes to be successful however, it is imperative that citizens develop rational thinking, critical support and reasonable opposition to the growing culture of mob mentality. Moreover, citizens also need to go beyond their narrow individual interests and prioritize broad national interests. The prevalence of corruption, which has been spreading like a wild fire is also frustrating the productive capacities of citizens that could positively contribute to the development of the country. All the aforementioned national concerns have largely been overlooked by the common course syllabi currently under construction. Such glaring absence of citizenship and moral education from the curriculum could be considered as one of the gaps that need to be urgently addressed. In this regard, by encouraging civil discourse on contending national issues, prioritizing peace and inculcating honourable disposition, the course civic and ethical studies would prepare students to contribute to the overall peace, stability and prosperity of the nation at large, hence magnifying the relevance and urgency of this course.</p>
<p style="text-align: center;"><b>Course Objectives</b></p>	<p><b>Upon a successful completion of this course, students will be able to:</b></p> <ul style="list-style-type: none"> <li>Understand the subject matter of Civics and Ethics;</li> <li>Cultivate certain moral values and civic virtues that enable them to be morally matured and competent in their professional and citizenry lives by practically exposing them to moral and civic debates/discussions and engagements.</li> <li>Develop such values/ virtues as recognition, appreciation and tolerance towards diversity and also build culture of peace</li> <li>Gain knowledge about the theoretical discourses and practices of state, government and citizenship, and their mutual interplay especially in the context of Ethiopia;</li> <li>Develop individual and/or collective potential of becoming self-confident citizens who can effectively participate in their legal-political, socio-economic and cultural lives;</li> <li>Understand the essences of such values and principles as democracy and human rights, multiculturalism and constitution and constitutionalism with especial reference to Ethiopia;</li> <li>Develop analytical and reflective skill of identifying global or national level development, democracy/governance and peace related issues of civics and ethics and then be able to produce or evaluate policies and practices in a civically and ethically responsible manner.</li> </ul>
<p style="text-align: center;"><b>COURSE CONTENTS AND SCHEDULES</b></p>	

Content Hours	Chapters, Sections and Sub-sections
6 hours	<p><b>Chapter One: Understanding Civics and Ethics</b></p> <ul style="list-style-type: none"> <li>○ Defining Civics, Ethics, Morality and amorality</li> <li>○ The Origin and Development of Civics and ethical education</li> <li>○ The purpose of civics and ethical education</li> <li>○ Citizen: Rights and responsibilities</li> <li>○ Competences of good citizen</li> </ul>
12 hours	<p><b>Chapter Two: Approaches to Ethics</b></p> <p>Normative ethics</p> <p>Teleological Ethics (Consequentialist)</p> <p>Hedonism</p> <p>Ethical and psychological Egoism: Epicureanism and Cyrenaicism</p> <p>Social Hedonism: Utilitarianism</p> <p>Deontological Ethics (Non- Consequentialist)</p> <p>Performance of One’s own Duty</p> <p>Devine-based Morality</p>
	<p>Kant’s Categorical Imperative</p> <p>W.D. Ross’s Prima Facie duty</p> <p>Virtue Ethics and Civic Virtues</p> <p>Basic Principles of Civic Virtues</p> <p>How to be virtuous person?</p> <p>Non-Normative Ethics</p> <p>Meta Ethics</p> <p>Absolutism/Objectivism</p> <p>Relativism/Subjectivism and Conventionalism</p> <p>Naturalism and Non-naturalism</p> <p>Issues in Applied Ethics</p> <p>Development Ethics</p> <p>How should a society Develop?</p> <p>Who is morally responsible for Underdevelopment?</p> <p>A ‘Just’ Development</p> <p>Environmental Ethics</p> <p>Ecosystem and the environmental pollutions</p> <p>Principles of Environmental Ethics</p> <p>Professional Ethics</p> <p>Profession and Professionalism</p>

	<p>The scope of Professional Ethics</p> <p>Common Principles of Professional Ethics</p>
<p>06 hours</p>	<p><b>Chapter Three: Ethical Decision Making and Moral Judgments</b></p> <p>Ethical Principles and Values of Moral Judgments</p> <p>The principle of equal consideration of interest</p> <p>Conflicting goals and ethical Justifications</p> <p>Ethical values and Justifiable exceptions</p> <p>Why Should I act ethically?</p>
<p>12 hrs</p>	<p><b>Chapter Four: State, Government and Citizenship</b></p> <p>Understanding State What is a state?</p> <p>Attributes of State</p> <p>State Structures</p> <p>Understanding Government</p> <p>Major Function and Purpose of Government</p> <p>Types of Government: Limited and Unlimited</p> <p>Systems of Government</p> <p>Understanding Citizenship</p> <p>What is Citizenship</p> <p>Inclusion and exclusion in Citizenship</p> <p>Ways of Acquiring Citizenship</p> <p>Ways of Losing Citizenship</p> <p>Citizenship in Ethiopian Context: Past and Present</p> <p>State Formation and Nation-building in Ethiopian Context</p> <p>Human Rights</p> <p>Definitions and Nature of Human Rights</p> <p>Basic Characteristics of Human Rights</p> <p>Dimensions of Human Rights</p> <p>The Protection and Promotion of Human Rights</p> <p>Human Rights Instruments: Documents</p> <p>Oversight Mechanisms: Institutions</p>
<p><b>Teaching methodology :</b> Lectures, Group discussions, debates &amp; Reflections</p>	

<b>Recommended Mode of assessment</b>	Quiz (5%) Tests (15%) Assignments (15%) Mid-Exam (25%) Final Examination (40%) Total: 100%
<p><b>Instructor's Commitment:</b> The course instructor is expected to provide timely lectures, demonstrate students to understand and practice the issues pertaining to central theme of the course, suggest available reading materials, and evaluate students' performance regularly.</p>	
<p><b>Course Policy:</b> The policy, which administer this course, is in line with University's legislation (no? year?) available at (website). Meaningful participation during class, group work and presentation is</p>	

## Recommended Reading Materials

1. Alexander, Larry (eds.).(1998). *Constitutionalism: Philosophical Foundations*. Cambridge: Cambridge University Press.
2. AssefaFisseha. (2006). *Federalism and Accommodation of Ethnic Diversity in Ethiopia: Comparative Study*. Utrecht: Wolf Legal Publishers.
3. Charles F. Kettering Foundation. & Harwood Group.1991. *Citizens and politics: a view from Main Street America*. Dayton, Ohio: The Foundation.
4. S. Oderberg and Timothy Chapel. (2004). *Human values, new essays on ethics and natural law* palgravemacmillan, Great Britain.
5. Fasil Nahum. 1997. *Constitution for a Nation of Nations: The Ethiopian Prospect*. Lawrenceville,NJ: Red Sea Publishers.
6. FDRE. (1995). *The Constitution of the Federal Democratic of Ethiopia*. Federal NegarritGazeta: Addis Abeba
7. Francis Snare (1992). *The Nature of Moral Thinking*. Rutledge, U.S.A and Canada Frechette,S. (1981). *Environmental Ethics*. U.S.A.: The Boxwood Press.
8. Goodin, Robert E. 2005. *Reflective Democracy*. Oxford University Press: New York.
9. James Paul and Clapham .1972. *Ethiopian Constitutional Development: A source book*. Haile Selassie I university: Addis Ababa.
10. Jeavons, T. (1991). *Learning for the common good: liberal education, civic education, and teaching about philanthropy*. Washington, DC: Association of American Colleges.
11. John M.Rist *Real Ethics*. (2004). *Reconsidering the Foundations of Morality* Cambridge university press U.K and U.S.A
12. Macedo, S. (2000). *Diversity and distrust: civic education in a multicultural democracy*. Cambridge, Mass: Harvard University Press.
13. Melzer, A. M., Weinberger, J., &Zinman, M. R. (1998). *Multiculturalism and American Democracy*.Lawrence, Kansas: University Press of Kansas.
14. Munitz, Milton K., (ed.) (1961). *A Modern Introduction to Ethics*, The Freem Press of Clencoe Navia, Luis E. and Kelly, Eugene. (1980). *Ethics and the Search for Values*, Prometheus Books. Niemi, R. G., &Junn, J. (1998). *Civic education: what makes students learn*. New Haven: YaleUniversity Press.
15. Norman, Richard. (1985). *The Moral Photospheres: An introduction to Ethics*, Oxford, Clarendon Press. Nzongola, Ntalajia and Margaret C. 1998. *The State and Democracy in Africa*. Asmara: Africa World Press.
16. Oppenheim, A. N. (1977). *Civic education and participation in democracy: the German case*.London ; Beverly Hills: Sage.
17. Penrose, W. O. (1952). *Freedom is ourselves: Legal rights and duties of the citizen as a basis for civic education*. Newark: University of Delaware Pres

# **COURSE TITLE: INCLUSIVENESS**

**COURSE CODE: SNIE 1012**

**Credit Hour = 2 Cr. Hr / 3 ECTS**

## **1. Course information**

1.1.1. Course Title: Inclusion in Education and Health Service

1.1.2. Course code: SNIE\_1012

1.1.3. Credit hours: 2

1.1.4. Contact hours: 32 Hours

## **2. Introduction**

Development efforts of any organization need to include and benefit people with disabilities through providing education, creating employability, promoting prosperity, reducing poverty and enhancing stability. Unfortunately, this has not been the practice for the majority of people with disabilities due to unfavorable attitude, negligence and exclusion from all development endeavors. It is obvious that people with disabilities are the large stand most disadvantaged minority in the world. They are about 15 percent of the global population (about one billion people), and 17.6 million in Ethiopia, with most extended families including someone with a disability (World Health Organization and World Bank and 2011). Exclusion practices of this large number of persons with disabilities in Ethiopia seem undermines their potential/ability to contribute to poverty reduction and economic growth within their household, their community and the country. It is clear that it is not impairment, but, the exclusion practices that has contributed for poverty aggravation for persons with disabilities. Exclusion practices of persons with disabilities have a long history, affecting the life of people with disabilities and the society at large. In the past and even today people have been discriminated due to their disabilities.

Inclusions promote effective developments through full participation of all members of a population and people with disabilities, where both are agents of development and beneficiaries. Through identifying and removing barriers, people with disabilities participate and benefit from the developments. Genuine inclusion of people with disabilities allow them actively participate in development processes and eliminate dependence syndrome, leads to broader benefits for families and communities, reduces the impacts of poverty, and positively contributes to a country's economic growth. All stages of development processes of any organization should be inclusive through creating equal access to education, health care services, work and employment, social protection and all development center of human being.

### **Course Description**

Special needs education refers to people with divers' disabilities, gifted and talented, and divers' population being at risk of education and development. As per the institutional reform that is focusing on enhancing development for all population, the field of inclusive education is taking center stage in institutional planning and improvement. This course introduces the process of achieving inclusion with all appropriate accessibility and established support system at institutional level.

In this course, the higher education students will learn how to assess, understand and address the needs of persons with disabilities and provide relevant support or seek extra support form experts. He/she also learns how to adapt and implementing services for an inclusive environment that aimed to develop holistic development such as affective, cognitive and psychosocial skills of the population with disabilities. Identification and removal/management of environmental barriers would find a crucial place in the course. The students learn how to give more attention and support for students with; hearing impairments, visual impairment, deaf-Blind, autism, physical and health impairments, intellectually challenged, emotional and behavior disorders, learning difficulty, communication disorders, gifted and talented student, and those at risk due to different reason (population who are environmentally and culturally deprived, abused, torched, abandoned, and orphaned and vulnerableness). All University students will be given the chance to study the specific developmental characteristics of each group of students with disabilities and come up with appropriate intervention strategies in inclusive settings of their respective professional environment and any development settings where all citizens are equally benefited.

#### **Learning outcome of the course**

The goal of this course is to provide the tools and strategies that help to create a convenient environment that accommodates population with divers' disabilities and potential. This course encourages exploring the benefits of collaborating with colleagues to design and implement inclusion an all sphere of life. It also guides the discovery of ways to modify environment as well as services and practices to meet the needs of all persons with disabilities in inclusive environment.

As a result of reviewing various reading materials, completing the assignments, engaging in related discussions, and strongly workings on activities, towards the completion of the course, the University students of all fields in Ethiopia will be able to:

1. Aware the needs of people with special needs, their potential and include all aspects of developmental needs
2. Identify population with special needs, their potentials and the learning and working styles of all population with special needs in their environment.
3. Demonstrate desirable attitude towards all population with special needs in their learning, working and living environment
4. Apply various assessment strategies for evidence-based planning to meet their needs
5. Attempt to adapt environments they are working and living in according to the need and potential of the population with special needs

6. Develop an accommodative and inclusive attitude help to think for the wellbeing and development of population with special needs.
7. Identify and select appropriate support and services method that addresses the life needs of population with special needs individually and on group bases.
8. Collaborate with experts and relevant others for the life success of all persons with disabilities in all environments.
9. Create and maintain successful inclusive environment **Syllabus**

## **Unit 1. Understanding students with diverse needs/special needs**

Time allotted: 10 contact hours

### **1.1. Unit objectives**

At the end of completing this unit, the students will be able to:

- 1.2.** Brief historical trends of special needs population and their holistic development
- 1.3.** Describe the effect of negative attitude on educational and life success of people with special needs
- 1.4.** Describe the nature of difficulties, preventable causes, identification, and assessment, of students with various impairments that affect their daily learning.
- 1.5.** Identify students with special needs whose daily life and functioning is challenged and those students who are at risk.
- 1.6.** Describe the need and characteristics of gifted and talented population
- 1.7.** Depict the condition of student at risk because of different reasons (environmentally, culturally and linguistically deprived, abused, torched, abandoned, and orphaned and vulnerable student) who need special attention in educational setting.

## **Unit 2. Understanding Inclusion**

### **1.1.1. Unit Objectives**

Upon accomplishing this unit, the teacher candidates will be able to perform the following activities.

- 1.2. Organize and implement inclusion for people with varying special needs
- 1.3. Demonstrate understanding of the principles of an inclusive environment, the rationale for inclusion, and its effect on education, and development.
- 1.4. Define terms associated with inclusion and its practices
- 1.5. Recognize what an inclusive environment looks and sounds like
- 1.6. Respect rights of students with special needs along with the disability convention ratified by the Ethiopian Government
- 1.7. Identify the benefits and challenges of inclusion
- 1.8. Modify environment to meaningfully accommodate population with special needs in all environment
- 1.9. Unit Contents and sub contents**
  - 1.9.1 Definition of inclusive environment and the support system



- 1.9.2 Elements of Inclusive environment
- 1.9.3 Characteristics of inclusive environment
- 1.9.4 Special needs population's right in the inclusive environment
- 1.9.5 Benefits and Challenges of Inclusion
- 1.9.6 Strategies in addressing individual needs.
- 1.9.7 Policies, legislations, strategies, legal framework and other related documents.

### **Unit 3: Identification of population with special needs**

Time allotted: 5 hours

#### **1. Unit objectives**

- 2. Upon completing this unit, the students will be able to:
  - 2.1 Learn and engage in developing identification tools that would be applicable in the environment
  - 2.2 Identify different needs among population with special needs and use various strategies that support their developmental needs.
  - 2.3 Demonstrate the process of identifying students who need special support and the options available for serving these students' educational needs

#### **3. Unit Contents and sub contents**

- 3.1 Development of checklists for identification of various difficulties.
- 3.2 Procedure of identification
- 3.3 Identifying learners needs, potentials and difficulties in learning

### **Unit 4. Assessment in special needs**

Time allotted: 5 hours

#### **1.1. Unit objectives**

- 1.1.1.1. At the end of this unit, the students will be able to:
  - 1.1.1.2. Adapt assessments for students with special needs
  - 1.1.1.3. Understand potential challenges of using standard assessment tools to measure the progress of students with special needs
  - 1.1.1.4. Modify and create assessments that accurately evaluate the skills and progress of all students, including those with special needs
  - 1.1.1.5. Use ongoing as well as summative assessments
  - 1.1.1.6. Use portfolios to assess ethically and appropriately what each student knows and able to do in inclusive classroom.
  - 1.1.1.7. Design an assessment that addresses an equity issue
  - 1.1.1.8. Assess, design and decide the most appropriate educational programming for student/youth with sensory impairments, physical and health impairments, intellectually challenged,

emotional and behavior disorders, learning difficulty, communication disorders, and students at risk and gifted and talented students.

- 1.1.1.9. Assess and design on elimination of social and environmental barriers that would facilitate inclusive education

### **1.2. Unit Contents and sub contents**

- 1.2.1.1. Strategy and procedure to develop assessment instrument.
- 1.2.1.2. Relevant components of assessment instrument.
- 1.2.1.3. Progressive assessments
- 1.2.1.4. Portfolios
- 1.2.1.5. Implication of assessment

## **Unit 5: Differentiated services for populations of special needs**

Time allotted: 5 hours **1.1 Unit**

### **Objectives**

At the end of this unit, the students will be able to involve effectively in the following activities:

- 1.1 Demonstrate understanding of the individualized services plan for population with special needs as a means of ensuring that these population receive services opportunities tailored to their needs
- 1. Describe the purpose of an individualized services plan
- 2. Identify the components of an individualized services plan
- 3. Develop strategies for providing remediation to population with special needs
- 4. Identify applicable technologies and software that will be useful for persons with various
- 5. Use the internet and other technology tools to enhance services and developments for populations of persons with various special needs
- 6. Evaluate technology applications for population with special needs
- 7. Explain the need for interdisciplinary individualized services plan teams, and describe the role and responsibility of each team member
- 8. Develop group intervention and describe its approach **9. Unit Contents and sub contents**
- 10. Strategies of mediation to students with special needs
- 11. Content-specific resources for students
- 12. Instructional technology
- 13. Individualized service plan
- 14. Interdisciplinary individualized services plan teams
- 15. Curriculum enrichment
- 16. The role and responsibilities of a general education teacher in the
- 17. Implementation of the individualized services

18. Planning group intervention

### **Unit 6. Promoting Positive Behaviors Institution-wide**

Time allotted: 5 hours

#### **1.1 Unit objectives**

1. Upon the accomplishing this unit, the Higher education students will be able to perform the following activities.
2. Implement strategies for managing an inclusive environment effectively
3. Describe behavior management modifications in an inclusive environment
4. Use strategies to increase desirable behaviors while decreasing undesirable behaviors
5. Develop effective techniques for responding to inappropriate behavior both in and out of the classroom
6. Build positive social relationships between all populations with special needs.
7. Demonstrate understanding of the importance of collaboration in an inclusive environment
- 8. Unit Contents and sub contents**
9. Behavior management modifications
10. Classroom management for inclusive environment
11. Social relationships and collaboration in an inclusive environment

### **Unit 7: Resources for the Inclusive environment**

Time allotted: 5 hours

#### **1.2. Unit objectives**

12. At the end of this unit, the students will be able to accomplish the following tasks:
13. Apply constructivist techniques to create a conducive climate to diverse populations' success.
14. Find out existing resource that enhances success of inclusive environment.
15. Make adaptations based on the nature of the disabilities
16. Adapt communication for people with special needs education, such as, Braille, augmentative communication and Sign Language
- 17. Unit Contents and sub contents**
18. Modification of environment and materials
19. Adapting learning and working process according to the needs
20. Identifying human material and other resources that help inclusive environmental activities.
21. Accessing adapted technologies
22. Accessing communication through various means such as Sign Language

### **Unit 8: Collaborative Partnerships with stakeholders**

Time allotted: 5 hours

#### **1.1 Unit objectives**

At the end of this unit the students will be able to:

- 22.1.1. Identify key elements of successful collaboration
- 22.1.2. Describe the benefits and challenges of collaboration for various stockholders for the success of inclusive education
- 22.1.3. Explain the process of cop-planning, and develop strategies for effective co-planning and team learning and working
- 22.1.4. Identify characteristics of successful stockholders' partnerships,
- 22.1.5. Design and plan strategies for community involvement

### **1.2 Unit Contents and sub contents**

- 22.1.6. Collaboration to successfully move towards inclusion
- 22.1.7. Planning Inclusive development in all sectors
- 22.1.8. Implementing inclusive
- 22.1.9. Individualized support as per the law, policies and directive
- 22.1.10. Evaluation and monitoring

## **Unit 9. Responsibilities**

### **General Responsibilities of Instructors**

Profile of teacher educator teaching this course must be the right professional in Special needs education. In the past, it was observed that non-special needs educators used to teach similar course. In order to produce quality teachers, this course should be offered only by teacher educator, MEd/or MA or PhD in special needs education. To meet the learning outcome aforementioned and enhance teachers' quality, the special needs teacher educator will have the following major responsibilities.

- 1.1.1. Advise students on all the aspects of the course
- 1.1.2. Provide the students with the syllabus and other materials well ahead of the delivery of it
- 1.1.3. Conduct the interactive lectures as per the plan
- 1.1.4. Facilitate students' individual assignments, group assignments, field works, practicum, seminars, presentations, and collaborative learning
- 1.1.5. Periodically assess the students' work
- 1.1.6. Provide the students with timely feedbacks on their graded and ungraded academic works
- 1.1.7. Follow on students' progress and communicate to the students
- 1.1.8. Keep student records on the whole work of the students
- 1.1.9. Design and execute students' consultation program

### **General Responsibilities of Students**

This course is designed for would teachers after completion of Bachelor degree in various fields. For successful completion of this course the teacher candidates would have the following responsibilities

- 1..1. Students are expected to actively and fully attend and participate all the in class and outclass learning activities. Missing a single class will cost students 2 points.
- 1..2. Carry out individual assignments, group assignments, field works, and practicum as per the details and deadlines
- 1..3. Students are expected to read given materials before class
- 1..4. Students are expected to read selected books and ten articles
- 1..5. Actively participate in the planning, organizing and conducting of all the seminars and presentations
- 1..6. Reflect on feedbacks and initiate actions on them
- 1..7. Passing the exams successfully

### **Unit 10. General Course Assessment and Evaluation Methods learning**

Dear teacher candidates, for each content you will complete getting started activities, read selected materials complete course works and group assignments. Assessment of the students would be a continuous process. The following scheme of evaluation would be used:

- ❖ Individual assignments 20% (optional, depending on the class size and teacher educators teaching load)
- ❖ Group assignment: 20%
- ❖ Overall performance (punctuality, attendance, participation and collaboration): 10%. This is based on concrete records of punctuality, attendance and fruitful participation, that is measured by teacher educator
- ❖ Written examination (could be more than one time): 50 to 70%

## **References**

1. Alemayehu Teklemariam and Temsegen Fereja (2011). *Special Need Education in Ethiopia: Practice of Special Needs Education around the World*. Washington: Gallaudet University Press.
2. Alemayehu Teklemariam (2019). *Inclusive Education in Ethiopia*: WILEY and Blackwell: Singapore

3. A Teachers Guide (2001). UNESCO. Inclusive Education and Classroom Practice in Secondary Education (2004).
4. Berit H. Johanson and Alemayehu Teklemariam (2006). Towards Special Needs Education as a University Discipline: An Important step on the way to Education for All. In When All Means All. Hakapaino Oy: Helsinki
5. Tirussew Teferra and Alemayehu Teklemariam (2007). Including the Excluded: Integrating disability into EFA Fast Track Initiative Process and National Education Plans in Ethiopia. World Vision MOE (2007). School Improvement Program
6. MOE (2010). Special Needs Program strategies implementation guide.
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8. Understanding and responding to children's need in inclusive classroom (2010). [www.europeanagency.org](http://www.europeanagency.org)
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10. ዓለማየሁ ትክለማርያም (2011). አካቶ ትምህርት ለምን፣ ለምን፣ ለምን እንዴት፤ አዲስ አበባ፡- ፋርኢስት አታሚ

## **COURSE TITLE: ENTREPRENEURSHIP AND BUSINESS DEVELOPMENT**

**Course Code:** Entr 2061

**Course Status:** Common course

**Course is coordinated by:** Management Department and Guest lecture from Industry

**Credit: 3, 5 ECTS**

**Course Description:** This interdisciplinary course is designed to introduce students the meaning and concept of entrepreneurship, creativity, innovation and their manageable processes that can be applied across careers and work settings. It focuses on building entrepreneurial attitude and behavior that will lead to creative solution within community and organizational environments. The Course topics include the history of entrepreneurship, the role of entrepreneurs in the globalized economy and the identification of entrepreneurial opportunities. The development of a business ideas, products and services, marketing and developing new ventures , the examination of feasibility studies and the social and ethical implications of entrepreneurship are incorporated. Besides, issues related to starting and financing a new venture are included. Finally, managing growth, transition and sustainability of the venture are considered. And forms of business organizations, legal and regulatory frameworks of governing the whole system are also encompassed in the course syllabus.

**Pre-requisite:** None

### **Course Objectives**

Upon the completion of this course, students will be able to:

- ❖ Define entrepreneurship within the context of society
- ❖ Identify business opportunities
- ❖ Prepare business plan
- ❖ Distinguish forms of business ownership
- ❖ Comprehend intellectual property rights in business practices
- ❖ Define basic marketing concepts
- ❖ Formulate context-based marketing strategies
- ❖ Identify and evaluate sources of financing new ventures
- ❖ Manage business growth and transition
- ❖ Practice ethical business with all stakeholders

### **Expected Learning outcomes**

As the intention of the course entrepreneurship is preparing college students for self employment, the curriculum is designed focusing on changing the behavior of students. It is designed in such a way that graduates will be more of “job creators than job seekers”. Much should be done on the behavioral aspects

than the technical aspects of entrepreneurship. Students are expected to develop the basic competencies that successful entrepreneurs should process

### Schedule

Week	Topics and subtopics	Course Objectives and Competences to be Acquired
<b>Week 1 &amp; 2</b>	1.1. Definition and philosophy of Entrepreneurship Vs Entrepreneurs 1.1.1. Historical origin of entrepreneurship 1.2. Type of Entrepreneurs 1.3. Role within the economy 1.4. Entrepreneurial Competence and Environment 1.4.1. Entrepreneurial Mindset 1.4.2. Demographic Factors 1.4.3. Entrepreneurial Environment 1.5. Entrepreneurship, creativity and Innovation	After completing this chapter, students will be able to: Define the term entrepreneurship and entrepreneur Identify types of entrepreneur Recognize the role of entrepreneurship in the economy Analyze the entrepreneurial competencies Differentiate the term creativity and innovation
	<b>Activities</b>	
	<b>Teacher's Activity</b>	<b>Students' Activity</b>
	Introducing objectives to the students Asking brain storming questions Giving brief introduction to the sub topics Giving class room and home based works Checking, evaluating, and giving feedback to student's work Summarizing the chapter	Define the term entrepreneurship and entrepreneur Discuss the role of entrepreneurship within the economy Explain the entrepreneurial competences
	<b>Delivery Methods</b>	Interactive Lecture, group discussion and reflection
	<b>Assessment</b>	
	<b>Quiz</b>	<b>5%</b>



Week 3, 4&5	1 2. 3.	<b>Business Planning</b> Opportunity Identification and Evaluation Business Idea Development Business Idea Identification Sources of Business Ideas Methods for generating Business Ideas The Concept of Business Planning Business Feasibility The Business plan Developing a business plan	After completing this chapter, students will be able to: Identify opportunity in the environment Evaluate the opportunities in the environment Generate business idea Explain the concept of business planning Identify components of business plan Develop business plan
	<b>Activities</b>		
	<b>Teacher's Activity</b>		<b>Students' Activity</b>
	Introducing objectives to the students Asking brain storming questions Giving brief introduction to the sub topics Giving class room and home based works Checking, evaluating, and giving feedback to student's work Summarizing the chapter		Discuss business opportunities in the environment Generate business idea Synthesize the components of business plan Develop business plan
	<b>Delivery Methods</b>		Interactive Lecture, group discussion and reflection
	<b>Assessment</b>		
	Group Project/ Business Plan Development Presentation		<b>15%</b> <b>5%</b>
Week 6 & 7	<b>Business Formation</b> The Concept of Business development Forms of Business (a short formation) Definition and Importance of SMEs Setting up small scale business Roles of SMEs Business failure and success factors. Problems of small scale business in Ethiopia Organizational structure and entrepreneurial team formation	After completing this chapter, students will be able to: Explain the concept of business development Identify the forms of business ownership Define SMEs Analyze the importance of SMEs Set Up small scale business List role of SMEs Distinguish the failure and success factors of SMEs Identify the problem of small scale business in Ethiopia Develop organizational culture	
<b>Activities</b>			

	<b>Teacher's Activity</b>	<b>Students' Activity</b>
	Introducing objectives to the students	Discuss the concept of business
	Asking brain storming questions Giving brief introduction to the sub topics Giving class room and home based works Checking, evaluating, and giving feedback to student's work Summarizing the chapter	development Brainstorm the importance of SMEs Discuss the failure and success factors of SMEs
	<b>Delivery Methods</b>	Interactive Lecture, group discussion and reflection
	<b>Assessment</b>	
	Individual assessment	10%
<b>Week 8 &amp; 9</b>	<b>Product or Services Development</b> The Concept of product or service technology Product or service development Process Legal and regulatory frameworks Intellectual Property Protection/Product or service protection Patent Trademarks Copyrighting	After completing this chapter, students will be able to: Describe the concept of product and services List product or service development process Discuss the intellectual property protection
	<b>Activities</b>	
	<b>Teacher's Activity</b>	<b>Students' Activity</b>
	Introducing objectives to the students Asking brainstorming questions Giving brief introduction to the sub topics Giving class room and home based works Checking, evaluating, and giving feedback to student's work Summarizing the chapter	Describe the concept of product and services  Discuss the failure and success factors of SMEs Analyze Product or service process Recognize legal and regulatory frameworks Describe intellectual property protection
	<b>Delivery Methods</b>	Interactive Lecture, group discussion and reflection
	<b>Assessment</b>	

<b>Week11&amp;12</b>	<b>Marketing</b> The Concept and philosophy marketing Marketing Mix and Strategies Marketing Information System Marketing intelligence Marketing research Competitive analysis Selling and Customer Service	After completing this chapter, students will be able to: Define marketing Identify Marketing mix and strategies Analyze components of marketing information system Explain competitive environment Explain competitive environment
	<b>Activities</b>	
	<b>Teacher's Activity</b>	<b>Students' Activity</b>
	Introducing objectives to the students Asking brainstorming questions Giving brief introduction to the sub topics Giving class room and home based works Checking, evaluating, and giving feedback to student's work Summarizing the chapter	Define marketing concept Discuss marketing mix strategies Differentiate components of marketing information system Explain competitive environment
	<b>Delivery Methods</b>	Interactive Lecture, group discussion and reflection
	<b>Assessment</b>	
	<b>Test</b>	15%
<b>Week 13&amp;14</b>	<b>Financing the new venture</b> Overview of Business Financing Source of financing Equity financing Debt financing Trade credit Lease financing Traditional Financing (Equib/Edir, etc...)	After completing this chapter, students will be able to: Know business financing Identify the sources of finance Understand with traditional financing techniques Familiarize with crowd funding Know Ethiopian micro finance system
	<b>Activities</b>	
	<b>Teacher's Activity</b>	<b>Students' Activity</b>
	Introducing objectives to the students Asking brainstorming questions Giving brief introduction to the sub topics Giving class room and home based works Checking, evaluating, and giving feedback to student's work Summarizing the chapter	Discuss business financing Identify the sources of finance Explore traditional financing techniques Aware about crowd funding Examine Ethiopian micro finance system

	<b>Delivery Methods</b>	Interactive Lecture, group discussion and reflection
	<b>Assessment</b>	
<b>Week 15 and 16</b>	Managing Growth and Transition Managing business growth New venture expansion strategies Business Ethics and Social responsibility	After completing this chapter, students will be able to: Know how to manage business growth Understand business expansion strategies Know & Internalize business ethics & social responsibilities
	<b>Activity</b>	
	<b>Teacher's Activity</b>	<b>Students' Activity</b>
	Introducing objectives to the students Asking brainstorming questions Giving brief introduction to the sub topics Giving class room and home based works Checking, evaluating, and giving feedback to student's work Summarizing the chapter	Discuss business growth & its management Identify new venture expansion strategies Examine business ethics and social responsibility system
<b>Week 15 and 16</b>	Experience sharing and guest speaker Engagement from areas of Health Expertise and Private / Public Private Institutions	Life lesson
	<b>Delivery Methods</b>	Interactive Lecture, group discussion and reflection
<b>Course Teaching Learning Methods</b>	Listen to a lecture and take notes on the lesson treated, take part in reading assignment, Group Discussion, Individual reflection, Debate among groups, Case study discussion and analysis, Assignment presentation	
<b>Assessment Methods</b>	Quiz Test Individual Assignment Business Plan Preparation Presentation Final Exam	5% 15% 10% 25% 5% 40%

<p><b>Commitment of Instructors and Learners</b></p>	<p><b>Preparedness:</b> You must come to class prepared by bringing with you the appropriate Materials like handouts, worksheets and exercises given, text books and completed assignments. Complete the individual and group assignments and other activities on time. You must plan your own learning through reading various course related materials and chapters in books. You are expected to work much individually to meet the requirement of the course.</p> <p>You have to use your time for group work and home study effectively.</p> <p><b>Participation:</b> Make active participation during discussions (you must participate in class). You are not participating if you are simply talking to a friend, doing homework, daydreaming, or not doing what the rest of the class is doing. If you are working in a group or with a partner, you must talk to your group members or partner and be a part of the group. Always be ready and willing to give constructive feedback to partners'/group members and to listen to their comments on your work.</p> <p><b>Medium:</b> Use only English, which is the medium of instruction, especially in the class room</p>
<p><b>Policy of college</b></p>	<p><b>Attendance:</b> It is compulsory to come to class on time and every time. If learners are going to <b>85%</b> during the term, they should not take this course</p> <p><b>Assignments:</b> Learners must do their individual and group projects and submit on time. Any assignments will be submitted on and before the specified deadline.</p> <p><b>Tests/Quizzes:</b> Learners have short quizzes and tests almost every unit. If they miss the class or, are late for class, they will miss the quiz or test and no makeup test or quizzes will be given for late arrivals. Therefore, learners are expected to comply with the rules and the regulations of the college as well.</p>
	<p><b>Cheating:</b> Learners must do their own work and not copy and get answers from someone else. When learners are in class, there are strictly forbidden from chewing gum, consuming any addictive substances, listening to recorders or CD players, or being involved in acts that interrupt the normal teaching-learning process. Besides, learners are required to switch off their cell phones before class and exam sessions. Learners who attempt to disobey these rules and regulations will be subject to disciplinary measures accordingly to the Senate Legislations of the University.</p>
<p><b>Reference &amp; Texts</b></p>	<p><b>Recommended Text book</b></p> <ul style="list-style-type: none"> <li>❖ Hirsh Robert D. and D. and Peters Michael P. “Entrepreneurship” Fifth Edition, Tata McGraw Hill Edition, 2002.</li> <li>❖ <b>Further References</b></li> <li>❖ Justin G. Longenecker and Carlos W. Moore, Small Business Management 12<sup>th</sup> edition, College Division South Western Publishing Co. Dallas, 2003</li> <li>❖ Holt David H. “Entrepreneurship – New venture Creation “Eastern Economy Edition</li> <li>❖ Donald F. Kutatko and Richard M. Hodgetts, “Entrepreneurship: A Cotemporary Approach” Fourth Edition.</li> <li>❖ Hailay Gebretinsae, Entrepreneurship and Small Business Management, 2nd Edition. approach “. Fourth Edition, the Dryden Press, 1998</li> </ul>

## **COURSE TITLE: SOCIAL ANTHROPOLOGY**

**COURSE CODE: Anth 1012 Credit hour: 2 ECTS: 3**

### **Course Description:**

This module which contain Sociology and Anthropology is designed for nursing students to understand the subject matter of sociology by briefly covering some of the ideas of the founding fathers of sociology and the major sociological theories, cross-cultural survey of cultural diversity and similarity in the interpretation of health, illness and healing systems. It also discusses themes including unity and diversity; kinship, marriage and family; indigenous knowledge systems and local governance, identity, multiculturalism, conflict, conflict resolution and peacemaking system; intra and inter-ethnic relations of Ethiopian peoples. In addition, the course explores culture areas of Ethiopia such as plough culture, enset culture and pastoralism. The course further covers marginalized minority and vulnerable groups in terms of age, gender, occupation and ethnicity by taking ethnographic case studies into account and discuss ways of inclusive growth.

### **General Objective:**

At the end of the course students will be able to assess & recognize the basic social components of societies in relation to health.

### **Specific Objectives: At the end of the course the student will be able to**

- ❖ Describe the definition of sociology
- ❖ Discuss the importance of Anthropology in Medical Science
- ❖ Explain the relationship of Anthropology and sociology
- ❖ Discuss the concept of family as a social unit and the status of an Individual in a family
- ❖ Explain the dynamics of society and common social problems
- ❖ Identify the socio-cultural and economic aspects of the community
- ❖ Develop an understanding of the nature of anthropology and its broader scope in making sense of humanity in a global perspective;
- ❖ Understand the cultural and biological diversity of humanity and unity in diversity across the world and in Ethiopia;
- ❖ Analyze the problems of ethnocentrism against the backdrop of cultural relativism;
- ❖ Realize the socially constructed nature of identities & social categories such as gender, ethnicity, race and sexuality;

- ❖ Explore the various peoples and cultures of Ethiopia;
- ❖ Understand the social, cultural, political, religious & economic life of different ethno-linguistic & cultural groups of Ethiopia;
- ❖ Understand different forms marginalization and develop skills inclusiveness;
- ❖ Appreciate the customary systems of governance and conflict resolution institutions of the various peoples of Ethiopia;
- ❖ Know about values, norms and cultural practices that maintain society together;
- ❖ Recognize the culture area of peoples of Ethiopia and the forms of interaction developed over time among themselves; and
- ❖ Develop broader views and skills to deal with people from a wide variety of socio-economic and cultural background

## Schedule

Week	Topic	Activities/Tasks	
		Instructor	Students
1	<p><b><i>The Discipline of Sociology</i></b></p> <p>1.1. Definition and subject matter of sociology</p> <p>1.2. Sociological imagination</p> <p>1.3. Scope of sociology: Micro &amp; Macro Sociology</p> <p><i>Group assignment</i></p> <p>1.4. Sociology and Other Social Sciences</p> <p>1.5. The Significance of Learning Sociology</p> <p><b><i>The Development of Sociology: A Historical Review</i></b></p> <p>2.1. Early Origins and Development: Factors which contributed for the emergence and development of Sociology</p> <p>2.2. Founders of Sociology</p> <p>2.2.1 Auguste Comte</p> <p>2.2.2 Herbert Spencer</p>	<p>Present lecture</p> <p>✓ Raise questions that require critical thinking and encourage class room discussion</p> <p>✓ Briefly summarize the lecture towards the end of the session</p> <p>✓ Present lecture</p> <p>✓ Raise questions that require critical thinking and encourage class room discussion</p> <p>✓ Briefly summarize the lecture towards the end of the session</p> <p>✓ Present lecture</p> <p>✓ Raise questions that require critical thinking and</p>	<p>Actively listen to the lecture</p> <p>✓ Take note of important points</p> <p>✓ Actively participate in class discussion</p> <p>✓ Actively listen to the lecture</p> <p>✓ Take note of important points</p> <p>✓ Actively participate in class discussion</p> <p>✓ Actively listen to the lecture</p> <p>✓ Take note of important points</p> <p>✓ Actively participate in class discussion</p>

	2.2.3 Emile Durkheim 2.2.4 Karl Marx 2.2.5 Max Weber <i>Quiz 1</i>	encourage class room discussion ✓ Briefly summarize the lecture towards the end of the session	
2	<b><i>Theoretical Perspectives in Sociology</i></b> 3.1.Structural Functionalism 3.2.Conflict Perspective 3.3.Symbolic – Interactionism	Present lecture ✓ Raise questions that require critical thinking and encourage class room discussion ✓ Briefly summarize the lecture towards the end of the session	✓ Actively listen to the lecture ✓ Take note of important points ✓ Actively participate in class discussion
3	<b><i>Culture</i></b> 7.1.The Concept of Culture 7.2.Components of Culture 7.3.Definition of basic cultural concepts <i>Quiz 2</i>	Present lecture ✓ Raise questions that require critical thinking and encourage class room discussion ✓ Briefly summarize the lecture towards the end of the session	
4	<b><i>Socialization</i></b> 5.1. Socialization defined 5.2. Types of socialization 5.3. Agents of socialization	Present lecture ✓ Raise questions that require critical thinking and encourage class room discussion ✓ Briefly summarize the lecture towards the end of the session	-  -
5	<b><i>Social Organization and Interaction</i></b> 6.1. Social structure: status and role 6.2. Groups and Institutions 6.3. Types of social groups 6.4. Social Values, Norms and Social Control <i>Quiz 3</i>	Present lecture ✓ Raise questions that require critical thinking and encourage class room discussion ✓ Briefly summarize the lecture towards the end of the session	
6	<b><i>Social Inequality and social processes</i></b> 7.1.Social stratification 7.2.Forms of social stratification 7.3.Social mobility 7.4.Social change 7.5.Social movements	Present lecture ✓ Raise questions that require critical thinking and encourage class room discussion	



	<i>Submission of assignment paper</i>	✓ Briefly summarize the lecture towards the end of the session	
7	<b><i>Deviance and Crime</i></b> 7.1. Definition of deviance and crime 7.2. Major differences between deviance and crime 7.3. Types of crime 7.4. Theories of deviance <i>Quiz 4</i>	Present lecture ✓ Raise questions that require critical thinking and encourage class room discussion ✓ Briefly summarize the lecture towards the end of the session	-
8	<b>Paper Presentation</b>	Introduce presenters and moderate presentations ✓ Raise questions regarding the papers being presented ✓ Provide clarifications	-
9	<b>Introducing Anthropology and its Subjects</b> <b>Sub-fields of Anthropology:</b>	Medical Anthropology Cultural Anthropology	-
10	<b>Human Culture and Ties that Connect</b>	-	-
11	<b>Human Diversity, Culture Areas, and Contact in Ethiopia</b>	-	-
12	<b>Marginalized, Minorities, and Vulnerable Groups</b>	-	-
13	<b>Theories of inter-ethnic relations and multiculturalism in Ethiopia</b>	-	-

- ❖ **Teaching method-** lecture, and Group discussion
- ❖ **Teaching materials-**LCD, White Board, chalk and board, video show
- ❖ **Assessment and Evaluation Criteria:**

Based on the progressive understandings of the course, students will be evaluated continuously through both non-graded assignments/activities, like (reading assignments) and graded assignments/activities and assessments including class discussion & participation, Test, Term Paper & presentation, Home Taken Exam/case studies and Final Exam.

**Assessment:**

Continuous assessment (class participation, Group and Individual assignment, quizzes)...60%

Final written examination ---40% **Course**

**Requirements:**

(Classroom, resources, and other inputs required to deliver the course will be listed)

**Suggested readings:**

1. ZerihunDoda,( 2005), Introduction to sociology for health students , Dehub University
2. Diana Kendal, Rick Linden, J. Lothain Murry (2001), sociology in our times: the essentials , 2nd ed., Nelson Thomson learning
3. Macaronis John J. (2008). SOCIOLOGY, 12th ed. Pearson prentice hall
4. Schafer, Richard. (2003). Sociology, New York: McGraw Hill, Inc.
5. Asmarom Legesse (2006). Oromo Democracy: an Indigenous African Political System. The Red Sea Press, Inc.
6. Cameron, M. Smith and Evan T. Davies (2008). Anthropology for Dummies. Wiley Publishing, Inc., Indianapolis, Indiana.
7. Clifored Geertz . (1973). The Interpretation of Cultures. A division of Harper Collins Publishers
8. Donald Donham . (1986). Marxist Modern. The Ethnographic History of Marxist Ethiopia.
9. Donald N. Levine. (1974). Greater Ethiopia: The Evolution of A Multiethnic Society. Chicago & London., University of Chicago.
10. Dunif-Hattis and Howard C. (1992). Anthropology: Understanding Human Adaptation. New York: Harper Collins, Inc
11. Eriksen, T. H. (2001). Small Places, larger Issues: An introduction to social and cultural anthropology. London: Pluto Press.
12. Eriksen, T. H. (2004). What is anthropology? London: Pluto Press.
13. Eriksen, T. Hylland. (2002). Ethnicity and Nationalism. London; Pluto Press.
14. Eriksen, T.H. and Nielsen, F.S. (2001). A History of Anthropology. London: Pluto Press.
15. Hallpike, Christopher R. (1972). The Konso of Ethiopia: A Study of the Value of a Cushitic People. Oxford: Clarendon Press.
16. Hamer, John. (1970). The Sidama Generational Class Cycles: A Political Geronotocracy. Africa 40,I (Jan,1970): 50-70.
17. Haviland, WA, (1999).Cultural Anthropology (9<sup>th</sup> ed.). Fort Worth: Harcourt and Brace College Pub.
18. Kottak, C. P. (2004) – Anthropology: the Exploration of Human Diversity (10<sup>th</sup> ed.). McGraw Hill, New York.
19. Lavenda, R. and Emily S. (2015). Anthropology. What Does It Mean to Be Human?. (3<sup>rd</sup>ed.). Oxford. Oxford University Press.
20. Pankhurst. R.(2001). Historic Images of Ethiopia. Shamans Books. Addis Ababa, Ethiopia.
21. Richard Jenkins. (2006). Rethinking Ethnicity. London Sage Publication.
22. Rosman, A., Rubel, P.G. and Weisgrau, M. (2009). The Tapestry of Culture: an Introduction to Social Anthropology. Lanham: Rowman and Little field.
23. Scupin and DeCorse (1988). Anthropology: A Global Perspective (2<sup>nd</sup> ed.). New Jersey: Prentice Hall.
24. Shack, William S. (1966). The Gurage: A People of the *Enset* Culture. London: Oxford University Press.
25. Triulzi et al. (2002). Remapping Ethiopia Easer African Studies:. Addis Ababa

# **COURSE TITLE: EMERGING TECHNOLOGIES AND ICT IN NURSING**

**COURSECODE: EmTe-1051**

## **Course Description:**

This module is intended to develop basic awareness of information and communication technology, computer system, computer network and data communication, computer security and ethics. And also to develop student's knowledge and skill on techniques and applications pertinent to and create a fundamental understanding of how the application of these technologies to medicine and human health contribute to health service quality by making informed decision. It is offered in premedicine

## **Course Objectives**

At the end of this module, learners will be able to apply knowledge and skills of basic computer technologies in improving the health service delivery, education and research by making informed decision.

## **Supporting Objective:**

At the end of the course students will be able to:-

- Describe some of the basic computer terminologies in medicine
- Explain the application of computer in medicine
- Identify computer system
- Describe computer Arithmetic & data representation in computer
- Describe the concept of Health Information Organizations and how they fit into the Nationwide Health Information Network
- Explain Integrating Healthcare Enterprise (IHE), Hospital Information System (HIS) and Electronic Medical Card (EMR)
- Explain health Information Technology Interoperability (HL7 and DICOM)
- Explain the importance of networks in the field of medicine
- Describe the evidence pyramid and levels of evidence
- apply the process of using evidence-based medicine to answer a medical question
- identify and use the most important online evidence based medicine resources
- State the difference between telehealth and telemedicine
- List the various types of telemedicine such as tele radiology, tele neurology
- explain the potential benefits of telemedicine to patients and clinicians

- Describe the importance of data security and privacy in medicine

**Prerequisites: None**

**Teaching and learning methods**

- Interactive lecture
- Discussion
- Demonstration
- Video show
- Computer lab practice

**Teaching-Learning Materials**

- AV aids (LCD and computer or writing board and marker or chalk)
- Computers with appropriate software □ Hand-outs of lecture materials

**Assessment methods**

**Formative Assessments**

- Assignment
- Practice Exercise in computer laboratory
- Student presentation

**Summative Assessment:**

- Class activity and presentation (5%)
- Group assignment (5 %)
- Individual assignment (5 %)
- Quiz (10 %)
- Mid-term test (30%)
- Final Exam (40 %)

**References**

2. Dida Midekos, Introduction to Computer Science, Ethiopia, AAU, 1994.
3. S.Rai & R.Ghosh, Computer Awareness (Introduction to Computers), News A.S.Offset, 2007.
4. A.K. Mishra, a Text Book of Information Technology, S.K. Kataria& Sons, 2007.
5. Computer science: An overview: international edition, (19th ed.) Pearson higher education, 2007
6. Robert E Hoyt, Nora Bailey, Ann Yoshihashi.Health Informatics: Practical Guide for Healthcare and Information Technology Professionals. Fifth Edition. 2012

7. Robert E. Hoyt, Melanie Sutton, Ann Yoshihashi. Medical Informatics: Practical Guide for the Healthcare Professional. Third Edition. 2009
8. Edward H. Shortliffe Leslie E. Perreault. Medical Informatics: Computer Applications in Health Care and Biomedicine. Second Edition. 2001
9. Sharon E Straus, W. scott Richardson, Paul Glasziou, R. Brain Haynes. Evidence-Based Medicine: How to Practice and Teach It. fourth edition. 2011

### Schedule

Schedule Date	Learning Activity	Required Assignment	Reading/
<b>Week 1 -2</b>	<b>Interactive lecture</b> Introduction to Information and Communication Technology INTRODUCTION TO COMPUTER Definition of Computer and Computer Science Types of computers Characteristics of computers Drawbacks of Computers Parts of Computer System Logical organization of a computer system Computer Hardware Computer Software EMERGING TECHNOLOGIES Human to Machine Interaction Future trends in emerging technologies AI in Health		
<b>Computer skills lab</b> Computer simulations/video showing the different computer hardware Practice: identification and Examination of computer hardware			
<b>Week 3 - 4</b>	<b>Interactive lecture</b> Data Representation and Number System Number System Data representation inside computers Computer arithmetic Computer coding system		
<b>Computer skills lab</b> Computer simulations showing the data representation			

<b>Week 5 – 6</b>	<b>Interactive lecture</b> Communications and its component Computer networks Importance network for medical field Network topology Introduction to Internet Search engines Internet of things	
<b>Computer skills lab</b> Computer simulation: showing the different network topology Practical work: using different search engines		
<b>Week 7</b>	<b>Interactive lecture and discussion</b> in <ul style="list-style-type: none"> <li>• Application of computer</li> <li>• Benefits of using system computer medicine</li> <li>• Augmented reality</li> <li>• Other emerging technologies</li> <li>• Nanotechnology</li> <li>• Biotechnology</li> <li>• Blockchain technology</li> <li>• Cloud and quantum computing</li> <li>• Autonomic computing</li> <li>• Computer vision</li> <li>• Embed systems</li> <li>• Cyber security</li> <li>• Additive manufacturing (3D Printing)</li> </ul>	
<b>Computer Skill Lab</b> Computer simulation: showing different videos usage of computer in Medicine, e-granary and Terasim.		
<b>Week 8 and 9</b>	<b>Interactive lecture and discussion</b> Introduction to HMIS ( Health Management Information System) Health information organization and flow Integrating Healthcare Enterprise (IHE) Hospital Information System (HIS) Electronic Medical Record (EMR) Health Information Technology Interoperability	
<b>Computer skills lab</b> Practical work: using different EMR especially Smart-Care.		

<b>Week 10 – 11</b>	<b>Interactive lecture and discussion</b> Introduction to Evidence Based Medicine Evidence pyramid and level Process of Evidence Based Medicine Common online/on-the-shelf evidence based resources	
<b>Computer skills lab</b> Practical work: using online Evidence Based Medicine resources		
<b>Week 12 -13</b>	<b>Interactive presentation and discussion</b> Introduction to data security and privacy in medicine definition of computer ethics & security Health Information Portability and Accountability Act (HIPAA) Backup Encryption Viruses & worms protection	
<b>Week 14- 15</b>	Interactive lecture and discussion Introduction to telemedicine and teleeducation Types of telemedicine Importance of telemedicine and teleeducation	
<b>Computer skills lab</b> Demonstration: demonstration how telemedicine and tele-education work		
<b>Week 16</b>	Review of the Computer Application to Medicine Discussion Computer skills lab <b>Study break for exam</b> <b>Written exam</b>	

## **COURSE TITLE: INTRODUCTION TO ECONOMICS**

**Course Code= Econ 1081 CRhr 3, 5 ECTS Course description**

This course provides a general introduction to economics combining elements of micro and macro fundamentals. The first part of the course focuses on theories of consumers' and producers' behavior. Besides the course will also cover the neoclassical theory of product and/or service pricing for perfectly competitive market and provide brief introduction to monopoly, monopolistic competition, and oligopoly market structures. The second major part of the course will discuss elements of macroeconomics such as macroeconomic goals, national income account and its measurement, macroeconomic problems and policy instruments. In offering the course, the real contexts Ethiopia will be thoroughly considered.

### **General objective**

The course will introduce students to the fundamental economic concepts and principles.

### **Specific objectives of the course** This

course is aimed at:

- ❖ Describing the major economic agents and their respective roles and objectives, ❖ Introducing the concepts of demand and supply and their interactions.
- ❖ Introducing students to the neoclassical theory of consumer preferences and utility maximization approaches,
- ❖ Discuss short- run behaviour of production and the related cost structure,
- ❖ Introduce the different market structures and their real world applications, and
- ❖ Equipping students with macroeconomic goals, national income accounting, economic problems and policy instruments in light Ethiopian context.

### **Expected learning outcomes**

After completing introduction to economics, students will be able to:

- ❖ Describe the major economic agents and their corresponding roles and objectives;
- ❖ Understand the concepts of demand and supply and their interactions;
- ❖ Explain the objective functions of consumers and producers' behavior in the short run.
- ❖ Differentiate the various types of market structures
- ❖ Understand the fundamental macroeconomic concepts, problems and policy instruments in the context of Ethiopia.



## Units and contents

Lecture	Topic & Sub Topics of the Course
	Chapter One: Introduction Chapter Two: Theory of Demand and Supply Chapter Three: Theory of Consumers' Behavior Chapter Four : The Theory of Production and Costs Chapter Five: Market structure Chapter Six: Fundamentals of macroeconomics (with stylized facts from Ethiopia)

### VIII. Course teaching methodology

The course will involve deploying different teaching methods that attempt to make the teaching-learning process as effective as possible. For most part of the course, delivery method will be arranged as to make the process student-centered. There shall be full and active participation from students and they are strongly encouraged to ask questions, to reflect on brain-storming queries, and be involved actively and attentively in take-home assignments and peer discussions that appear during the semester both within and outside class-room sessions.

While there is no limit to the imagination and flexibility of the instructor, the course delivery techniques will generally involve the following items:

- ❖ Lecture and Brain-storming sessions
- ❖ Group discussions and Individual and group assignments

### IX. Assessment Methodology

Students will be evaluated using different mechanisms and their weights as indicated in the table below.

**Table1. General assessment profile**

Assessment method	Weight
Assignment (individual and/or group)	20%
Tests/ quizzes	40%
Final Exam	40 %
<b>Total</b>	<b>100%</b>

### X. Course policy

- **Attendance:** it is compulsory to come to class on time and every time. If students are going to miss **85% of the class** during the term, they shall not be allowed to sit the final exam,

- **Assignments:** students must do their individual and group assignments and submit on time. Assignments shall be submitted on or before the due date as specified by the instructor,
- **Tests/Quizzes:** instructors should give short quizzes and tests as appropriate.
- **Cheating:** students must do their own work and should not copy answers from someone else.
- **Acts and mannerisms:** When students are in class, they are strictly forbidden from chewing gum, consuming any addictive substances, listening to recorders or CD players, or being involved in acts that interrupt the normal teaching-learning process. Besides, students are required to switch off their cell phones before class and exam sessions. Students who attempt to disobey these rules and regulations will be subject to disciplinary measures accordingly to the Senate Legislations of the University.

#### **XI. Commitments of instructor & students**

- ❖ **Preparedness:** students must come to class prepared by bringing the appropriate materials like handouts, worksheets, exercises given, text books and assignments. Students must plan their own learning through reading various course related materials and chapters in books. They are expected to work a lot individually to meet the requirement of the course. They have to use their time for group work and home study effectively.
- ❖ **Participation:** students are expected make active participation during class sessions.
- ❖ **Coordination:** instructors shall play a pivotal role in facilitating the teaching and learning processes both in the class room and outside the class rooms.

#### ❖ **XII. Readings and texts**

1. Koutsoyiannis, Modern Microeconomics
2. D.N.Dwivedi, 1997, Micro Economic Theory, 3<sup>rd</sup> edition., Vikas Publishing
3. R.S. Pindyck & D.L. Rubinfeld, Microeconomics.
4. Hal R. Varian, Intermediate Microeconomics: A Modern Approach, 6<sup>th</sup> edition.
5. C.L.Cole, Micro Economics: A Contemporary Approach.
6. Ferguson & Gould's, 1989, Microeconomic Theory, 6<sup>th</sup> edition.
7. N. Gregory Mankiw, 2007, Macroeconomics, 4<sup>th</sup> edition.
8. P. Aghion and P. Howitt, 2009, The Economics of Growth, The MIT Press.  
A. B. Abel and B.S. Bernanke, 2017, Macroeconomics, 9<sup>th</sup> edition, Pearson.
9. Ayele Kuris, Introduction to Economics, 2001.
10. Begg, Fisher & Dornbusch, 2005, Macroeconomics, 8<sup>th</sup> Ed
11. Liberman, Marc and Hill, Robert E, 2005, Introduction to Economics 2<sup>nd</sup> Ed.
12. Richard E. Carmichael, 2006, Economics for Everyone: An introduction to Economics.

## COURSE TITLE: GLOBAL TRENDS

**Course Code:** GLOT 1012

**Credit Hour= 2 Cr. Hr / 3 ECTS**

Instructor's Information	Contact	Name					
		Academic Position					
		Cell Phone					
		Email					
		Office No					
Course Title		Global Trends					
Course Code		GLTR 1041					
Credit Hours		03 Cr.H (5 ECTS)					
Status of Course		Compulsory Common Course					
Student Work Load		Lectures		Library and Group Work	Assign Report	Home Study	Total W. L.
		32hrs.	06	16hrs.	13hrs.	30	97hr

<b>Course description</b>	<p>The course is designed to familiarize learners on the nature and development of international relations and global issues. It deals with nations, states, national interest, cooperation and conflict among states, and the role of state and non-state actors in the international system. Additionally, it explains the nature of international law, global political economy and the nexus between regionalism and globalization. It also critically examines the contemporary global issues and how the international community is trying to address them. It is organized to systematically examine international issues by employing different theories and providing concrete examples from different parts of the world. Last but not least, after providing rigorous understanding of how the international system functions, it will equip learners to consciously observe and critically understand the Ethiopia's Relations with the outside world. As the saying goes "Think globally acts locally!"</p>
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<b>Course Purpose</b>	<p>We live in an exciting yet challenging period in history. The world seems to dominantly progress in constantly opposing directions. On the one hand, because of globalization, the world is getting closer and becoming interconnected in ways never experienced before generating more wealth, scientific innovation, and cross-national cooperation. On the other hand, the challenges of war, terror, arms trade, money laundering, disease, poverty, environmental problems, human and drug trafficking still generate an aura of uncertainty for the present and future generations. As such, decisions made by states, multinational corporations, non-governmental organizations, and terrorists have a direct impact on our life. Thanks to global flow of information, there may be a multitude of individuals who know the events that are occurring in the world. But some still do not understand why events happened the way they have happened; and what consequences they may bring. In light of this, this course is designed to equip students with a necessary knowledge and skill which enable them to understand the political, economic and social dynamics of the global system, how it works, its actors, its influence and ways to cope up global issues from theoretical and practical point of view.</p>
<b>Course objectives and expected learning outcomes</b>	<p>At the end of the course, students will be able to:</p> <ul style="list-style-type: none"> <li>Understand nations, nationalism and states</li> <li>Explain the nature and historical development of international relations</li> <li>Gain basic knowledge of the major theories in the discipline of International relations and develop the ability to critically evaluate and apply such theories</li> <li>Elucidate national interest, foreign policy and diplomacy</li> <li>Explicate the nature and elements of international political economy and international law</li> <li>Examine the extent and degree of influence of state and non-state actors in the international system</li> <li>Examine the roles major international and regional institutions play in world Politics</li> <li>Critically evaluate the major contemporary global issues</li> <li>Assess the overriding foreign policy guidelines of Ethiopia in the past and present Explore Ethiopia's role in regional, continental and global institutions and affairs</li> </ul>
<b>Couse Contents and Schedule</b>	
<b>Contac Hours</b>	<b>Chapters, Sections and Sub-Sections</b>
6 hours	<p>Chapter one: Understanding International relations Conceptualizing Nations, Nationalism and States</p> <p>The Nature and Evolution of International Relations</p> <p>Actors of International Relations</p> <p>State Actors</p> <p>Non-State Actors</p> <p>Levels of Analysis in the International Relations</p> <p>Power, Anarchy and Sovereignty in the International System</p> <p>The Structure of International System</p>

<b>6 Hours</b>	<p>Chapter Two: Contending Theories of International Relations</p> <ul style="list-style-type: none"> <li>Realism and Neo-Realism</li> <li>Liberalism and Neo-Liberalism</li> <li>Marxism and Neo-Marxism</li> <li>Critical Theory</li> <li>Constructivism</li> <li>Modernism and Post-Modernism</li> </ul>
<b>8 Hours</b>	<p>Chapter Three: Foreign Policy and Diplomacy</p> <ul style="list-style-type: none"> <li>Conceptualizing National Interest, Foreign Policy and Diplomacy</li> <li>National Interest and Foreign Policy</li> <li>Determinants of National Interest and Foreign Policy</li> <li>Objectives of Foreign Policy</li> <li>Foreign Policy Orientations</li> <li>Instruments of Foreign Policy</li> <li>A Survey of Foreign Policy and Diplomacy of Ethiopia</li> <li>Foreign Policy of Ethiopia during the Reign of Emperor Menilik II</li> <li>Foreign Policy of Ethiopia during the Reign of Emperor Hailesillassie</li> <li>Foreign Policy of Ethiopia during the Derg Regime</li> <li>Foreign Policy of Ethiopia during the EPRDF</li> </ul>
<b>8 Hours</b>	<p>Chapter Four: The International Political Economy (IPE)</p> <ul style="list-style-type: none"> <li>Meaning and Nature of IPE</li> <li>The Nexus between Politics (State) and Economics (Market)</li> <li>Theoretical Perspectives on IPE</li> <li>Classical Mercantilism and Economic Nationalism</li> <li>Classical Liberalism and Adam Smith</li> <li>Comparative Advantage and David Ricardo</li> <li>Neoliberalism and Keynesianism</li> <li>Marxism and Dependency Theory</li> <li>Hegemonic Stability Theory</li> <li>Developmental State Model</li> <li>The Political Economy of North-South, South-South: Conflict and Cooperation</li> </ul>
<b>8 Hours</b>	<p>Chapter Five: International Law</p> <ul style="list-style-type: none"> <li>Meaning, Nature and Areas of International Law</li> <li>Sources and Subjects of International Law</li> <li>Law Making and Enforcement process at International and Domestic level</li> <li>Formation, Recognition and Responsibility of State under International Law</li> </ul>
	<p>Chapter Six: Regionalism and Globalization</p> <ul style="list-style-type: none"> <li>The Concept, Nature and Development of Regionalism and Regional Integration</li> <li>The Old and New Regionalism</li> <li>Major Theories of the Regional Integrations</li> <li>Functionalism</li> <li>Neo-functionalism</li> <li>Inter- governmentalism</li> </ul>

<b>6 Hours</b>	<p>Supra-nationalism  Selected Cases of Regional Integration (EU, AU...)  Definition and Evolution of Globalization  Aspects of Globalization  Actors of Globalization  Pros and Cons of Globalization  Ethiopia in a globalized World  Regionalization versus Globalization and State  The Convergence, Divergence and Overlapping relations of Regionalization and Globalization  The Hypocrisy of Sovereignty</p>
<b>6 Hours</b>	<p>Chapter Seven: Major Contemporary Global Issues  Conceptualizing Global Issues  Survey of Global Issues  Security Issues  Terrorism, Religious Fundamentalism and political Extremism  Weapons of Mass Destruction and The Nuclear Power paradox  Illicit Human Trafficking, Drug Trafficking, Firearms Trafficking  Environmental Issues  Climate Change and Global warming  Technology Related Issues  Cyber Crime and Cyber Security  Other Social, Economic and Political Issues  Human Rights  Migration and Refugee  Trade War  Aid, Debt Relief</p>
Teaching methodology: Lectures, Group discussions, debates & Reflections	
<b>Recommended Mode of Assessment</b>	<p>Tests (20%)  Assignment and Presentation (15%)  Mid-Exam (25%)  Final Examination (40%)</p>
<p><b>Instructor's Commitments:</b> The course instructor is expected to provide timely lectures, demonstrate students to understand and analyze the issues pertaining to central theme of the course, suggest available reading materials, and evaluate students' performance regularly.</p>	
<p><b>Course Policy:</b> Meaningful participation during class, group work and presentation is important for the success of this course. Since each class builds on the one before it, attendance is mandatory.  <b>Academic Integrity:</b> The department expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work. If you cheat on an exam you will receive a failing grade, and most likely will be dropped from the class. Academic dishonesty of any type by a student provides grounds for disciplinary action by the instructor or department. In written work, no material may be copied from another. The work that you submit must be your own, for both moral and legal reasons.</p>	
<b>Recommended Reading Materials</b>	

Altinay, Hakan (2011) *Global Civics: Responsibilities and Rights in an Interdependent World*. The Brookings institution: Washington

Armstrong, David (ed.)(2009). *Routledge Handbook of International Law*. London: Routledge

Baylis, J. and Smith, S. (eds.) (1997). *The Globalization of World Politics*. Oxford: Oxford University Press.

Browlie, Ian (2003). *Principles of Public International Law*. (6th ed.). New York: Oxford University

Copson, Raymond w.(2007)*The United States in Africa: Bush policy and beyond in association with International African Institute Royal African Society of Social Science Research Council*, Zed Books: London Crane, George T. and Abal Amawi (1997). *The Theoretical evolution of International Political Economy: A Reader* (2nd Edition). Oxford University Press: New York.

Crawford, Robert (2000) *Idealism and Realism in International Relations: Beyond the Discipline*. Routledge:USA

DeLombaerde, Philippe (ed.) (2008) *Governing Regional Integration for Development: Monitoring Experiences, Methods and Prospects*. Ashgate Publishing Company: England

Demelo, Jaime and Arvind Panagariy (eds.) (1993) *A New Dimensions in Regional Integration* ,Centre for Economic Policy Research 1993, Cambridge University Press: USA

Demelo, Jaime and Arvind Panagariy (eds.) (1993) *A New Dimensions in Regional Integration*, Centre For Economic Policy Research 1993, Cambridge University, Press: USA

Der, James D. (2009) *Critical Practices in International Theory: Selected Essays*,Routledg, Abingdon, Oxon

Farrell, Mary (ed.) (2005) *Global Politics of Regionalism: Theory and Practice*. Pluto Press: London

Genest, Mark A. (1996). *Conflict and Cooperation: Evolving Theories of International Relations*. Fourth Worth: Harcourt Brace and Co.

Goldestein, Joshua S. and John C. Pevhouse (2006). *International Relations brief 3rd ed*. Prisscilla Mc Greehon.

Goldstein J. S. (2003) *International Relations*. 5th edition. Washington, D.C. Pearson Education Press, Inc

Griffiths, Martin (Ed.) (2007). *International Relations Theory for the Twenty-First Century:An introduction*. New York: Routledge

Griffiths, Martin and Terry O'Callaghan (2002) *International Relations: The Key Concepts*. Routledge: London

Griffiths, Martin, et al. (2008). *International Relations: The Key Concepts (Second Edition)*. New York: Routledge

Griffiths, Martin, Steven C. and M. Scott (2009), *Fifty Key Thinkers in International Relations* (2nd edition)

Hancock, Kathleen J. (2009) *Regional Integration; Choosing Plutocracy*, Palgrave Macmillan: United States

Henderson, Conway W.(1998) *International Relations: Conflict and Cooperation at the Turn of the 21 st Century*. Guilford: McGraw-Hall.

Hollis, Martin and Steve Smith (1990) *Explaining and Understanding International Relations*. United States: Oxford University Press.

Holsti, K.J. (1995) *International Politics: A Framework for Analysis*. 7th ed. New Jersey: Prentice Hall.

J.M. Biswaro. (2012) *The Quest for Regional Integration in the Twenty First Century: Rhetoric versus Reality - A Comparative Study*, Mkukina Nyota Publishers Ltd, Dares Salaam: Tanzania

Macdonald, David B.et.al (ed.)(2007)*The Ethics of Foreign Policy*. Ashgate Publishing Limited: England

Malm, Endreas and Shora Esmailian (2007). *Iran on the Brink Rising Workers and Threats of War*. Pluto Press

Mintz, Alex and Karl De Rouen (2010) *Understanding Foreign Policy Decision Making*, Cambridge University Pres: Cambridge

Rengger, N.J.(2000) *International Relations, Political Theory and the Problem of Order: Beyond International Relations theory?* Routledge: London

Rourke, John T. and Mark A. Boyer (1998). *World Politics: International Politics on the world Stag.*, brief. 2nd ed. Guilford: Dushkin/McGraw-Hall.

Salmon, Trevor C. (Ed.) (2005). *Issues in International Relations*. New York: Routledge

Steans, Jill &Lloyd Pettiford (2005). *Introduction to International relations: Perspectives &Themes*. 2nd ed. Harlow: Pearson Prentice Hall.

Sutch, Peter & Juanita Elias (2007) *International Relations, the basics*. Taylor & Francis.

. Todaro, Michael P. and Stephen Smith (2003). *Economic Development* (8thed).

- . Trevor S. Salmon and Mark F. Imber (ed) (2008). Issues in International Relations. Routledge Publishing, 2nd Edition
- . Vinay Bhargava (2006). Introduction to Global Issues.
- . Waltz, Kenneth N. (2003) Progress in International Relations Theory. Belfer Center for Science and International Affairs John F. Kennedy School of Government, Harvard University Cambridge, Massachusetts
- . Weber, Cynthia (2001) International Relations Theory: A Critical Introduction(2nd edition) Routledge: London



## BIOMEDICAL SCIENCE I

Module Name: Biomedical science I

Module Code: Biom-M 1022

Module ECTS: 10 ECTS

Credit hours: 6 Credit

### Module summary

	Weeks	Total hours	ECTS
Total module duration	16	156	
<input type="checkbox"/> Class room-based teaching (lecture)		73	
<input type="checkbox"/> SDL (clinical and biomedical lab) teaching		83	
<input type="checkbox"/> Exam period	1wk		
<b>Contents contributed to the module</b>	Total hrs.	Grade %	
<input type="checkbox"/> Human Anatomy	39	25 %	3
<input type="checkbox"/> Human Physiology	42.12	27 %	3.5
<input type="checkbox"/> Medical Biochemistry	14	9 %	1.5
<input type="checkbox"/> Pharmacology	17.2	11 %	1.5
<input type="checkbox"/> Medical Microbiology	17.2	11 %	1.5
<input type="checkbox"/> Clinical laboratory methods	9.4	6 %	1
<input type="checkbox"/> Parasitology	8	5 %	1
<input type="checkbox"/> Basic science lab	9.4	6 %	1
<b>Total</b>	<b>156</b>	<b>100%</b>	<b>13</b>

### Module Description:

This module is designed for BSc nursing students to provide with the opportunity to develop their knowledge and understanding of basics of biomedical sciences, introduction to human anatomy and physiology, microbiology, the musculoskeletal system, respiratory and circulatory system. More over this module provide opportunity for students to identify the principles of basic clinical laboratory methods relevant to provision of basic nursing care.

The basic science labs are related to Musculoskeletal, Respiratory, Circulatory, HEENT and nervous system.

**Module Outcomes: By the end of this module, the students will be able to**

- Identify the normal structure of Musculoskeletal, Respiratory, Circulatory, and HEENT systems
- Comprehend basic functions of Musculoskeletal, Respiratory, Circulatory, and HEENT systems
- Outline the transmission & expression of genetic information and correlate the biochemical processes with health & disease.
- Explain the biochemical aspects of human life
- Recognize Pharmacodynamics and Pharmacokinetics of drugs.
- Explain mechanism of action, interaction, classification, adverse effect of drugs acting on Musculoskeletal, Respiratory, Circulatory, And HEENT systems
- Differentiate the normal and abnormal laboratory values related to the mentioned system systems and interpret the results.
- Describe the most common disease causing agents and cellular response to the agents.

**Teaching-Learning Methods**

- Interactive lecture and discussion
- Small group discussion
- Role play
- Case study
- Clinical simulation
- Video show
- Demonstration
- Side lab

**Teaching-Learning Materials**

- Learning guides and checklists
- Text books
- Reference manual
- Flip chart
- Writing board
- Posters
- Anatomic models & simulators
- LCD Projector
- White board, marker

- Laptop
- Audiotape
- Videotapes

### **Methods of Assessment ❖ Formative (60%)**

- ✓ Tests
- ✓ Quizzes
- ✓ Simulation based practical tests

### **❖ Summative assessment of the overall module (40%)**

- ✓ Written test =25%
- ✓ OSCE=15%

### **References**

1. Tortora, G.J. & Bryan D. 11<sup>th</sup> edition. Principles of Anatomy & Physiology
2. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy
3. Langman J & Woerdeman M.W (1978). Atlas of medical Anatomy
4. W.Henry Hollinshead 4<sup>th</sup> ed. Text Book of Anatomy
5. Frederic H.Martini,7<sup>th</sup> edition. Fundamentals of human anatomy & physiology
6. Joanna R. Fuller: Surgical Technology, Principles and Practice 2nd edition, W.B. Saunders Company Philadelphia 1986.
7. Guyton A C. Textbook of Medical physiology. Guyton &Hall 11<sup>th</sup> ed, 2006
8. Ganongy WF. Review of Medical physiology. Mc Graw Hill 22<sup>nd</sup> ed, 2006.
9. John Bullock, Joseph Boyle and Michael B. Wang. Physiology, National Medical Series (NMS) for Independent Study. Williams & Wilkins. 3<sup>rd</sup> edition 1992
10. Berne R.M. and Levy M.N. Physiology. 3<sup>rd</sup> edition.
11. Mackenna B.R and Callander R. 1991. Illustrated Physiology 5<sup>th</sup> edition.
12. Parth C.M. 1990. Pathophysiology. 3<sup>rd</sup> edition.
13. Hawker R.W. Notebooks of medical physiology.
14. Findlag A.L.R. Physiological principles of Reproduction and the foetus.
15. Salah Abu-sitta. Handouts containing different chapters (eight separate handouts)
16. Barbara M. Soule: Infections and Nursing Practice, Prevention and control, Mosby, 1995.
17. Verolyn Roe Bolander (1994), Sorensen and Luckman's basic nursing-a psycho physiologic approach
18. Markell, Voge, Jhon. Medical Parasitology. 6<sup>th</sup> ed. 1986. W.b. Saunders company.

19. Paul Chester Beaver, Rodney Clifton jung, Eddie Wayne Cupp. Clinical Parasitology. 9<sup>th</sup> ed. 1984.  
K.M. Varghese company
20. Herbert M. Gilles. Protozoal Diseases. 1999. Arnold
21. Monica Cheesbrough. District Laboratory Practice in Tropical countries. Part I -2<sup>nd</sup>ed updated. 1998.  
Tropical Health Technology. Cambridge
22. Judith S. Heelan, Frances W. Ingersoll. Essentials of Human Parasitology. 2002. Delmar Thomson  
Learning VigarZaman. Atlas of Medical Parasitology. 1979 Harold W. Brown, Franklin A. Neva.  
Basic Clinical Parasitology. 5<sup>th</sup> ed. 1983
23. Mohammed AwolAdem and WaqtolaCheneke. Medical Parasitology: Lecture note for medical  
laboratory technology students: upgraded lecture note serious. 2006
24. Modern Parasitology A text book of Parasitology ( Cox 2<sup>nd</sup>edn)
25. Clinical parasitology (Beaver et. al 9<sup>th</sup>ed.)
26. Atlas of Medical Helminthology and Protozoology (Jaffee and Leach 2<sup>nd</sup> edition)
27. District laboratory practice in tropical counties (Monica CheesbroughVol I)
28. Essentials of Parasitology (Murray D. Dailey 6<sup>th</sup> ed. 1996)
29. Essentials of parasitology (Gerald D. Schmidt 4<sup>th</sup> ed. 1994)
30. Parasitology for medical Laboratory Technology students – Lecture note series (GirmaM. and  
Mohammed A. 2003)
31. Craig ad Faust’s clinical parasitology (Ernest C. Faust 8<sup>th</sup> ed. 1977) Web materials – DPDx
32. Pamela C.C, and Richard A.H., Lippincott's Illustrated Reviews: Biochemistry 3rd edition, J.B.  
Lippincott Company Philaderphia, 1998.
33. Stryer L. Biochemistry, CBS publishers and distributors, 1986 or recent edition.
34. Lehninger A.L, Principles of Biochemistry, CBS publishers and distributors, 1987 or recent edition.
35. Murray R.K et. al. Harper's Biochemistry 24<sup>th</sup> edition a Large Medical Book, 1996  
Zubay, Parson, Vance, Principles of Biochemistry, WM.C. Brown Publishers USA, 1995.

<b>Biomedical Science I module</b>			
<b>Date/Week</b>	<b>Learning Activity</b>	<b>Required Reading (Assignment)</b>	

<p><b>Week 1</b></p>	<p><b>Lecture And Discussion: 8 Hrs.</b>  <b>Overview of the module (30 min)</b>  ✓ Structure and design  ✓ Education strategies  ✓ Core competencies  ✓ Teaching and learning methods  ✓ Assessment methods  <b>Introduction to human Anatomy --- 2.5 hrs.</b>  ✓ History, Definition and divisions of Anatomy  ✓ Anatomical terminologies  ✓ Body Parts, Planes and Body Movement  <b>Medical Biochemistry ----- (2 hrs.)</b>  <b>INTRODUCTION TO BIOCHEMISTRY</b>  ✓ Definitions  ✓ Role of biochemistry in medical education  <b>Physiology ----- (2hrs.)</b>  ✓ Introduction to Human Physiology  ✓ Cellular organization of the body  ✓ Ultra-structure of generalized animal cell  ✓ The cytoplasm, cytoplasmic organelles  cytoplasmic inclusions  <b>Clinical laboratory methods (1 hr.)</b>  • Introduction to laboratory methods  • Lab selection and interpretation of results and</p>	<p><b>8 hrs./wk</b></p>	
<p><b>Week 2</b></p>	<p><b>Lecture And Discussion: 14 Hrs.</b>  <b>Anatomy ----- 4 hrs.</b>  ✓ Naming of skeletal muscles  ✓ Orientation of fibers  ✓ Relative position  ✓ Antagonistic Muscles  ✓ Synergistic Muscles  ✓ Major skeletal muscles  ✓ Origin</p>	<p><b>14 hrs./wk</b></p>	

	<ul style="list-style-type: none"> <li>✓ Insertion</li> <li>✓ Action</li> <li>✓ Innervations</li> <li>✓ Blood supply</li> </ul> <p><b>Body cavities and membranes</b></p> <p><b>Physiology (3 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ The plasma membrane</li> <li>✓ Cell nucleus</li> <li>✓ Cell cycle</li> <li>✓ Cell extensions and connection</li> <li>✓ Flagella</li> <li>✓ Cytoskeleton</li> </ul> <p><b>Microbiology [2 Hrs.]</b></p> <ul style="list-style-type: none"> <li>✓ Introduction to Microbiology</li> <li>✓ General Bacteriology and Immunology</li> <li>✓ Scopes of Microbiology, History of Microbiology</li> <li>✓ Germ theory of disease, Classification of microorganisms (Eukaryotic and prokaryotic cells)</li> <li>✓ Structure and classification of bacteria</li> <li>✓ Identification and nomenclature of bacteria</li> <li>✓ Bacterial growth and genetics</li> </ul> <p><b>Pharmacology ----- (2 hrs.)</b></p> <p><b>Introduction to general pharmacology</b></p> <ul style="list-style-type: none"> <li>✓ Introduction (definitions, History, subdivision of pharmacology)</li> <li>✓ Pharmacokinetics:</li> <li>✓ Pharmacodynamics</li> </ul> <p><b>Clinical laboratory method (3 hrs.)</b></p> <ul style="list-style-type: none"> <li>• Basic hematological tests</li> <li>• Malignant and nonmalignant blood tests</li> </ul>		
<b>Week 3</b>	<p><b>Lecture and Discussion: 9 hrs.</b></p> <p><b>Anatomy:</b></p> <p><b>Body regions and cavities (4 hrs.)</b></p> <p><b>Body regions</b></p> <ul style="list-style-type: none"> <li>✓ Abdominopelvic regions and quadrants ✓</li> <li>Regional names and structures</li> </ul> <p><b>Physiology _____ 3 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Autonomic nerves system</li> </ul> <p><b>Microbiology (3 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Growth, nutrition &amp; multiplication of Bacteria</li> <li>✓ Bacteriological techniques of Sterilization disinfection</li> </ul>	<b>9 hrs. /wk</b>	&

<p><b>Week 4</b></p>	<p><b>Lecture And Discussion: 10 Hrs.</b>  <b>Anatomy</b>  <b>Levels of structural organization (4 hrs.)</b>  ✓ Chemical level of organization</p>	<p><b>10 hrs./wk</b></p>	
	<p>✓ The cellular levels of structural organization  ✓ The tissue levels of organization ✓ The organ levels of organization ✓ The system levels <b>Biochemistry 4 hrs.</b>  <b>MOLECULAR BIOLOGY</b>  ✓ Nucleotide structure  ✓ Biosynthesis &amp; Degradation of nucleotides  ✓ DNA structure and Replication ✓ RNA structures and Transcription ✓ Protein Synthesis:  ✓ The Genetic Code  ✓ Translation  ✓ Mutation  ✓ Regulation of gene expression in Prokaryotes ✓ Eukaryotes  <b>Microbiology -----2 hrs.</b>  ✓ Innate and adaptive immunity  ✓ Immunization  ✓ Hypersensitivity reactions</p>		
<p><b>Week 5</b></p>	<p><b>Lecture And Discussion: 10 hrs.</b>  <b>Pharmacology----- (3 hrs.)</b>  <b>Pharmacodynamics</b>  ✓ Site &amp; mechanisms of drug action  ✓ Character of receptors and drugs  ✓ Drug – receptor interactions  ✓ Dose – response – relationship (ED50, LD50, therapeutic index, potency, maximum efficacy)  <b>Anatomy of Musculoskeletal SYSTEM (3 hrs.)</b>  ✓ The Structure of a Typical Bone ✓ Compact bone  ✓ The Histological Features of compact bone:  ✓ Osteon (Haversian System)  ✓ Central (Haversian) canal  ✓ Perforating (Volkmann’s) canal Spongy bone  ✓ The Histological Features of Spongy Bone  ✓ Classification of Bones  <b>Physiology ----- 4 hours</b> Physiology of the skeletal system</p>	<p><b>10 hrs./wk</b></p>	

<b>Week 6</b>	<b>Lecture And Discussion: 8 hrs.</b> <b>Physiology ----- 4 hours</b> ✓ Physiology of the nerve ✓ Physiology of the Muscle <b>Introduction to Medical Parasitology (2 hrs.)</b>	<b>8 hrs./wk.</b>	
	✓ Features of parasites ✓ Source of infection ✓ Mode of transmission ✓ Direct mode of transmission  ✓ Indirect mode of transmission ✓ Routes of transmission ✓ General life cycle of parasites ✧ Direct life cycle ✧ Indirect life cycle		
	<b>Anatomy (2 hrs.)</b> <b>Basic science lab</b> ✓ Body Regions ---- Anatomic chart		
<b>Week 7</b>	<b>Lecture And Discussion: 10 hrs.</b> <b>Physiology</b> <b>Body fluid and electrolytes ----- 2 hrs.</b> ✓ Blood ✓ Fluid compartments: ECF, ICF ✓ Composition of body fluid ✓ Water and electrolyte homeostasis <b>Microbiology ----- [2 hrs.]</b> ✓ Gram negative bacteria ✓ Gram positive bacteria <b>Biochemistry</b> <b>ENZYMES &amp; COENZYMES -----2 hrs.</b> ✓ Definition and Classification ✓ General properties ✓ Kinetics of enzymes ✓ Clinical applications of enzymes <b>Parasitology -----4 hrs.</b>  ✓ Nematode helminthes /Round worms/ ✓ General characteristics ✓ Classification (Intestinal & tissue) ✓ Ascaris lumbricoides ✓ Trichuris trichura ✓ Enterobius vermicularis	<b>10 hrs./wk</b>	



<p><b>Week 8</b></p>	<p><b>Lecture Hour 12 hrs.</b>  <b>Microbiology----- [2 hrs.]</b>          ✓ Antimicrobial agents: principles, mechanisms of action          ✓ drug resistance,          ✓ Basic principles of immunology ✓ Defense Mechanisms:          ✓ Hypersensitivity Reactions and autoimmunity  <b>Anatomy:</b>  <b>RESPIRATORY SYSTEM -----2 hrs.</b></p>	<p><b>12 hrs./wk.</b></p>	
	<p>✓ Respiratory pathways          ✓ Anatomical divisions of Respiratory system:              ✧ Upper respiratory zone              ✧ Lower respiratory zone  <b>Physiology – -----2 hrs.</b>  <b>Physiology of the Respiratory System</b>          ✓ Functions of respiratory system          ✓ Mechanism of breathing          ✓ Diffusion and gas transport (O<sub>2</sub> and CO<sub>2</sub>)          ✓ Regulation of breathing  <b>Biochemistry ----- 2 hrs.</b>  <b>WATER &amp; pH</b>          ✓ Role of water in biological system          ✓ Acid base theories          ✓ Definition of pH, pK<sub>a</sub> and pK<sub>b</sub>          ✓ Buffers &amp; Acid-base balance  <b>Pharmacology of respiratory system ----- (3 hrs.)</b>          ✓ Classifications          ✓ Sites &amp; mechanisms of drug action          ✓ Drugs mechanism of action and indication,          contraindication and side effect ✓          Therapeutic approaches          Biomedical Lab -----1 hrs.          ✓ Respiratory volume and capacity measurement</p>		

<p><b>Week 9</b></p>	<p><b>Lecture Hour 12 hrs.</b></p> <p><b>Anatomy</b></p> <p><b>CIRCULATORY SYSTEM ----- 4 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Cardiovascular system</li> <li>✓ Heart- structure</li> <li>✓ Circulatory roots</li> <li>✓ Lymphatic system</li> </ul> <p><b>Physiology of the cardiovascular system</b></p> <p><b>Physiology of circulatory system ----- [4 hrs.]</b></p> <ul style="list-style-type: none"> <li>✓ Physiology of the heart</li> <li>✓ Electrophysiology of the heart muscle</li> <li>✓ The cardiac cycle</li> <li>✓ The heart rate and its regulation</li> <li>✓ The arterial blood pressure and its regulation</li> </ul> <p><b>Cardiovascular Pharmacology----- (4 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Drugs acting in cardiac system</li> <li>✓ Sites &amp; mechanisms of drug action</li> <li>✓ Individual drugs mechanism of action and indication, contraindication and side effect</li> </ul> <p>Therapeutic approaches (nitrites –beta blockers, calcium antagonists)</p> <ul style="list-style-type: none"> <li>✓ Principles of therapy (positive inotropics – digoxin, diuretics, vasodilators)</li> </ul>	<p><b>12 hrs.</b></p>	
<p><b>Week 10</b></p>	<p><b>Lecture Hour 6 hours.</b></p> <p><b>Anatomy</b></p> <ul style="list-style-type: none"> <li>✓ Accessory organs ----- (2 hrs.)</li> </ul> <p><b>Physiology of Blood -----2 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ functions and composition of blood</li> <li>✓ Plasma and plasma proteins</li> </ul> <p><b>Clinical laboratory method ----- (2 hrs.)</b></p> <p>Urinalysis and renal function Test</p> <p><b>Hematology</b></p> <ul style="list-style-type: none"> <li>✓ PT/PTT, Serology tests</li> </ul>	<p><b>6 hrs./wk</b></p>	

<p><b>Week 11</b></p>	<p><b>Lecture Hour 6 hours. Clinical laboratory methods Immune hematology 2 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Principle of Immunohematology</li> <li>✓ Blood group antigens and antibodies</li> <li>✓ Immunohematology reaction</li> <li>✓ Test to discover etiology of infections</li> <li>✓ Blood transfusion</li> </ul> <p><b>Body fluid collection and Analysis 2 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ CSF</li> <li>✓ Synovial fluid</li> <li>✓ Serous Fluid analysis</li> </ul>	<p><b>6 hrs./wk</b></p>	
<p><b>SDL: Clinical lab method , Sample collection (2 hrs.)</b></p>			
<p><b>Week 12</b></p>	<p><b>Lecture Hour 8 hours.</b></p> <p><b>ANATOMY OF THE EYE -- (2 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Anatomy of the Visual System</li> <li>✓ Organization of the visual cortex</li> <li>✓ Visual cortex</li> </ul> <p><b>Physiology of the eye----- (2 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Color Vision , visual cortex</li> <li>✓ Perception of Motion, Depth and Form</li> <li>✓ Optics of Vision</li> <li>✓ Photochemistry of Vision</li> <li>✓ The Neurophysiology of vision ✓ Central Visual Pathways</li> </ul> <p><b>Biochemistry -----2 hrs.</b></p> <p><b>CARBOHYDRATES</b></p> <ul style="list-style-type: none"> <li>✓ Structure &amp; classification of carbohydrates ✓</li> <li>Digestion &amp; absorption of carbohydrate</li> </ul> <p><b>Clinical laboratory method ----- 2 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ DM laboratory management</li> <li>✓ Principle of Immunohematology</li> </ul>	<p><b>8 hrs./wk</b></p>	

<p><b>Week 13</b></p>	<p><b>Lecture Hour 6 hrs.</b>  <b>Anatomy of the Ear and Face----- (2 hrs.)</b>  ✓ Functional Anatomy of the Ear and face  ✓ Anatomy &amp; excitation of central pathways  <b>Physiology</b>  <b>Physiology of the ear and face----- (2 hrs.)</b>  ✓ The Auditory physiology  ✓ Conducting Mechanism of the Ear  ✓ Physiology of Chemical sense  ✓ Characterization of chemical senses  <b>The sense of taste and Smell----- (2hrs)</b>  ✓ The sense of taste and Gustatory ability  ✓ Abnormalities ('Taste Blindness')  Olfactory Thresholds</p>	<p><b>6 hrs./wk</b></p>	
<p><b>14 week</b></p>	<p><b>Interactive lecture and discussion – 14hrs.</b>  <b>Anatomy of the nerve system ----- 2 hrs.</b>  <b>Spinal cord:</b>  ✓ Types and structures of the cells of the nervous system  ✓ Structure and function  ✓ Protection and coverings  ✓ Spinal nerves <b>The Brain:</b>  ✓ General structures, coverings, Brain ventricles  ✓ Principal parts and their functions  ✓ Formation and circulation of CSF  <b>Physiology of the nerve</b>  <b>Physiology of Central Nervous System ..... 2hrs</b>  ✓ Functional structure of neurons  ✓ Classification of neurons and neuroglia cells'  ✓ Synapses  ✓ Synaptic transmission at neuronal synapses  ✓ General organization of the NS  ✓ General tissue; neurons and neuralgia  ✓ Somatic sensation and their pathways  <b>Pharmacology of Central Nervous system..... 4hrs</b>  ✓ Sedative – hypnotic (anxiolytics )drugs  ✓ Pharmacotherapy of epilepsy  ✓ Psychotropic and anti-Parkinson drugs  <b>Biomedical skill lab ( 4hr )</b>  ✓ Blood film preparation  ✓ Hemoglobin determination  ✓ Hematocrit determination  ✓ Immunoematology Body fluid analysis</p>	<p><b>14hrs/wk</b></p>	

<b>15 week</b>	<p><b>Interactive lecture and discussion---11hrs</b></p> <p><b>Anatomy of the peripheral nervous system (PNS)-----2hrs</b></p> <ul style="list-style-type: none"> <li>✓ Neural pathways</li> <li>✓ Autonomic nervous system (ANS)</li> <li>✓ Divisions and structures</li> <li>✓ Cranial nerves(I-XII)</li> <li>✓ nerve plexus</li> <li>✓ Spinal nerves</li> </ul> <p><b>Physiology of the nerve system ----- 3hrs</b></p> <ul style="list-style-type: none"> <li>✓ Motor function of the NS</li> <li>✓ Reflexes; arcs, examples</li> <li>✓ Higher motor centers</li> <li>✓ Cerebral cortex</li> <li>✓ Basal ganglia function</li> <li>✓ Hypothalamus function</li> <li>✓ Thalamus function</li> <li>✓ Cerebellum function</li> <li>✓ The brain stem; reticular formation</li> <li>✓ Pyramidal and extra pyramidal tracts, lesion</li> <li>✓ The limbic system function</li> <li>✓ Sleep, memory</li> </ul> <p><b>Pharmacology of Autonomic Nervous System ---- 4hrs</b></p> <ul style="list-style-type: none"> <li>✓ Drugs acting on the cholinergic system</li> <li>✓ Cholinomimetics</li> <li>✓ Cholinergic receptor blockers</li> <li>✓ Antimuscarinics</li> <li>✓ Neuromuscular blockers</li> <li>✓ Drugs acting on the adrenergic system</li> <li>✓ Sympathomimetics</li> <li>✓ Adrnergic blockers</li> </ul> <p><b>Pharmacotherapy of pain --- 1hrs</b></p> <ul style="list-style-type: none"> <li>✓ Classification of analgesics</li> <li>✓ Treatment of pain with narcotic</li> <li>✓ Treatment of pain with non-narcotic</li> <li>✓ Pharmacotherapy of rheumatic arthritis</li> <li>✓ Treatment of acute &amp; chronic gout</li> <li>✓ General &amp; local anesthetics</li> </ul> <p><b>Parasitology _____ 2hrs</b></p> <ul style="list-style-type: none"> <li>✓ Plathyhelminthes</li> <li>✓ Cestodes /The tape worms/</li> </ul>	<b>11hr/wk</b>	
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	<ul style="list-style-type: none"> <li>✓ General characteristics</li> <li>✓ Taeniasaginata</li> <li>✓ Taeniasolium</li> <li>✓ Hymenolepis nana</li> <li>✓ Echinococcus granulosus</li> </ul>		
<b>16 Week</b>	<b>Exam and OSCE</b>		

## FOUNDATION OF NURSING I

Module Name: Foundation of Nursing I

Module Code: NursM-1033

Module ECTS: 8

Credit hours: 5

### Module summary

	<b>Weeks</b>	<b>Total hours</b>	<b>ECTS</b>
Total module duration	20	270	
<input type="checkbox"/> Class room based teaching (lecture)	14	196	
<input type="checkbox"/> SDL (clinical and demonstration )	13	74	
<input type="checkbox"/> Exam period	1		
<b>Course to Contents contributed to the module</b>	<b>Total hrs</b>	<b>Grade %</b>	
<input type="checkbox"/> Ethics	16.2	6	5
<input type="checkbox"/> Fundamental of Nursing	32.4	12	
<input type="checkbox"/> First Aid	27	10	
<input type="checkbox"/> Skill lab + Demonstration	30	11	0.9
<input type="checkbox"/> Hospital Practice	162	60%	2.5
<b>Total</b>	267	100%	

### Module Description:

This module is designed for BSc in nursing students to provide with the opportunity to develop their knowledge and understanding of foundations of nursing relevant to provision of basic nursing care to clients. The module will help students to introduce the different nursing process frameworks, patient safety device and comfort, body mechanics and mobility, essential assessment components and medication and fluid therapies will be discussed. The practice component of the module will provide the students with the opportunity to apply this knowledge into practice while providing nursing care for patients with Musculoskeletal, Respiratory, Circulatory, HEENT and neurologic problems.

### Module Objectives:

By the end of this module, students will be able to provide basic nursing care by applying knowledge of fundamentals of nursing. The student will be able to apply basic ethical principles

in nursing, identify appropriate equipment's for the patient care, assess the patients 'condition, diagnose the patients 'problems provide appropriate nursing intervention for the patient and provide first aid with recommended infection prevention and patient safety practices.

**Learning Outcomes: By the end of this module, the students will be able to ❖**

Apply nursing process as a framework to conduct basic nursing skill.

- ❖ Apply basic first aid and accident prevention measures.
- ❖ Apply the principles of aseptic and sterile technique when practicing patient care
- ❖ Demonstrate standard precautions
- ❖ Apply patient safety and comforting devices
- ❖ Perform dressing and bandaging
- ❖ Demonstrate safe medication administration to clients
- ❖ Utilize proper body mechanics
- ❖ Describe nursing measures that promote defense mechanisms for infection.
- ❖ Monitor and evaluate all procedures
- ❖ Perform vital signs measurement
- ❖ Mention indication for advanced nursing procedures (catheterization, Enema, Colostomy irrigation, Tracheotomy care, Oxygen administration, Liver biopsy Lumbar puncture, cast application& removal, Bone marrow puncture, paracentesis abdominous, thoracentesis etc)

**Teaching-Learning Methods** ○ Interactive

lecture and discussion ○ Small

group discussion ○ Role play ○

Case study ○ Clinical simulation ○

Video show

○ Demonstration ○

Side lab

**Teaching-Learning Materials** ○ Learning

guides and checklists ○ Text books

○ Reference manual ○ Flip chart ○

Writing board ○ Posters ○



- Anatomic models & simulators ○
- LCD Projector ○ White board,
- marker ○ Laptop ○ Audiotape ○
- Videotapes

**Methods of Assessment ❖ Formative (60%)**

- ✓ Tests
- ✓ Quizzes
- ✓ Simulation based practical tests

**❖ Summative assessment of the overall module (40%)**

- ✓ Written test =25%
- ✓ OSCE=15%

<b>Foundation I module</b>		
<b>Date/Week</b>	<b>Learning Activity</b>	<b>Required Reading (Assignment)</b>
<b>Week 1</b>	<b>Lecture And Discussion: 8 Hrs.</b> Fundamental of nursing Overview of the module (1 min) ✓ Structure and design ✓ Education strategies ✓ Core competencies ✓ Teaching and learning methods ✓ Assessment methods	<b>8 hrs./wk</b>

	<p><b>Nursing Ethics ----- (3 hrs.)</b></p> <p><b>Foundation of modern nursing</b></p> <ul style="list-style-type: none"> <li>✓ Definition of nursing</li> <li>✓ Historical background of nursing</li> <li>✓ Religious and civilization influence on nursing</li> <li>✓ The history of Nursing in Ethiopia</li> <li>✓ Nursing as a profession rather than occupation</li> </ul> <p><b>Philosophy of nursing</b></p> <ul style="list-style-type: none"> <li>✓ Over review of theory</li> <li>✓ Definition of terms related to theory</li> <li>✓ Relationship of theory to practice and research</li> <li>✓ Major nursing theories used for nursing practice</li> <li>✓ Non-nursing theories used for nursing practice</li> </ul> <p><b>Fundamental of Nursing:</b></p> <p><b>Infection prevention and patient safety ----- (2 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Hand hygiene</li> <li>✓ Hand washing</li> <li>✓ Hand antiseptics</li> <li>✓ Antiseptic hand rub</li> <li>✓ Surgical scrub</li> <li>✓ Personal protective equipment</li> <li>✓ Donning and removing PPE</li> <li>✓ Donning and Removing Gowns</li> <li>✓ Donning and removing a Cap and Mask</li> <li>✓ Donning and removing glove(Sterile &amp; Clean)</li> <li>✓ Eye protection</li> <li>✓ Creating and maintaining sterile field</li> </ul> <p><b>First aid and emergency nursing -----( 2 hr)</b></p> <p><b>Introduction of first aid and emergency nursing</b></p> <ul style="list-style-type: none"> <li>✓ Define first aid and accident prevention</li> <li>✓ Identify reasons for First Aid</li> <li>✓ Explain principles of first aid</li> <li>✓ List value of First Aid Training</li> <li>✓ Adopt general directions for given first aid</li> </ul>	
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<p><b>Week 2</b></p>	<p><b>Lecture And Discussion: 5 hrs.</b>  <b>Professional Ethics</b>  <b>Ethical and legal aspects to nursing (1 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Ethics issue in nursing</li> <li>✓ Ethical principles</li> <li>✓ Legal issue in nursing</li> <li>✓ Standardized of care</li> <li>✓ Patient bill of right</li> <li>✓ Informed consent</li> <li>✓ Holistic view of health <b>Fundamental of Nursing</b></li> </ul>	<p><b>5 hrs./wk</b></p>
	<p><b>Recording and reporting (2 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Admission and discharge documentation</li> <li>✓ Client progress notes</li> <li>✓ Critical incident reporting to senior staff</li> <li>❖ Recording and Reporting</li> <li>❖ Analysis of Ethical Dilemma</li> </ul> <p><b>First aid-----2 hrs.</b>  Triage</p> <ul style="list-style-type: none"> <li>✓ Emergency triage</li> <li>✓ Triage color code</li> </ul>	
<p><b>Week 3</b></p>	<p><b>Lecture And Discussion: 3 Hrs.</b>  <b>Fundamental of nursing ----- (3 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Historical development of nursing process</li> <li>✓ Component of nursing process</li> <li>✓ Assessments <ul style="list-style-type: none"> <li>✧ Different approaches of nursing assessment <ul style="list-style-type: none"> <li>➤ Gordon’s approach</li> <li>➤ Systemic approach</li> <li>➤ Human response pattern</li> </ul> </li> </ul> </li> <li>✓ Nursing Diagnosis</li> <li>✓ Planning</li> <li>✓ Outcome identification</li> <li>✓ Implementation</li> <li>✓ Evaluation</li> </ul>	<p><b>3 hrs./wk</b></p>

<b>Week 4</b>	<b>Lecture And Discussion: 4 hrs.</b> <b>Fundamental of nursing -----2 hours</b> <ul style="list-style-type: none"> <li>✓ Instrument processing <ul style="list-style-type: none"> <li>✧ Decontamination</li> <li>✧ Cleaning</li> <li>✧ Drying and packing</li> <li>✧ High level disinfection</li> <li>✧ Sterilization</li> <li>✧ Storing</li> <li>✧ Distribution of sterile items</li> <li>✧ Cleaning the operating room</li> </ul> </li> <li>✓ Waste segregation</li> <li>✓ Sharp waste disposal</li> <li>❖ Patient unit care</li> <li>✓ Linen processing</li> </ul>	<b>4 hrs. /wk</b>
<b>SDL: Infection Prevention PS (2 hrs.)</b>		
<b>Week 5</b>	<b>Lecture And Discussion: 9 Hrs.</b> <b>Nursing Ethics</b> <b>Communication process (3 hrs.)</b> <ul style="list-style-type: none"> <li>✓ Definition of communication</li> <li>✓ Purpose and levels of communication</li> <li>✓ Types of communication</li> <li>✓ Component of communication</li> <li>✓ The basic characteristics of communication</li> <li>✓ Techniques of effective communication</li> <li>✓ Therapeutic communication</li> </ul> <b>Fundamental of nursing</b> <b>Managing patient safety device and comfort (2hrs)</b> <ul style="list-style-type: none"> <li>✓ Applying cotton rings</li> <li>✓ Applying foot-board</li> <li>✓ Applying pillows</li> <li>✓ Applying air rings</li> <li>✓ Applying bed-cradle</li> <li>✓ Adjusting side rails of beds</li> <li>✓ Applying sand bag</li> <li>✓ Applying Splint</li> <li>✓ Applying fracture board</li> <li>✓ Applying back rest</li> <li>✓</li> </ul>	<b>9 hrs./wk</b>

	<p><b>First aid and emergency nursing</b></p> <p><b>Dressing and Bandages—2 hrs</b></p> <ul style="list-style-type: none"> <li>✓ Definition of dressings</li> <li>✓ Principles of dressing</li> <li>✓ Bandaging</li> <li>✓ Types of commercially available bandages</li> <li>✓ Application of bandages</li> <li>✓ First Aid kits and supplies</li> </ul>	
	<p><b>SDL Practice Areas (2 hr.)</b></p> <ul style="list-style-type: none"> <li>✓ Patient comfort and safety device</li> </ul>	
<b>Week 6</b>	<p><b>Lecture And Discussion: 8 hrs.</b></p> <p><b>First aid and emergency</b></p> <p><b>Bone and joint injuries -----1 hr.</b></p> <ul style="list-style-type: none"> <li>✓ Definition, cause, S/S first aid management of: <ul style="list-style-type: none"> <li>◇ Fractures</li> <li>◇ Dislocation</li> <li>◇ Sprains</li> <li>◇ Strain</li> </ul> </li> <li>✓ Prevention of Accidents resulting in skeleton &amp; muscular injuries</li> </ul> <p>Prepare nursing care plan for client with fractures</p> <p><b>Fundamental of nursing ----- 3 hrs.</b></p> <p><b>Body mechanics and mobility</b></p> <ul style="list-style-type: none"> <li>✓ Positioning and moving a patient</li> <li>✓ Patient ambulation</li> <li>✓ Assisting patient with assistive devices <ul style="list-style-type: none"> <li>◇ Gait belt</li> <li>◇ Prosthetics assistance</li> <li>◇ Cane</li> <li>◇ Walker</li> <li>◇ Crutch</li> <li>◇ Gaits used with crutches <ul style="list-style-type: none"> <li>➤ Four-point gait</li> <li>➤ Two-point gait</li> <li>➤ Three-point gait</li> <li>➤ Swing-through gait</li> <li>➤ Swing to gait</li> <li>➤ Up &amp; down stair</li> </ul> </li> </ul> </li> <li>◇</li> </ul>	<b>8 hrs./wk</b>

	<ul style="list-style-type: none"> <li>✓ Lifting the patient</li> <li>✓ Dangling</li> <li>✓ Logrolling</li> <li>✓ Shoulder lift</li> <li>✓ Moving patient up on the bed</li> <li>✓ Patient transfer</li> <li>✓ Applying ROM exercises</li> <li>✓ Prepare nursing care plan for client with assistive devices</li> </ul> <p><b>Bed making - -----1 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Stripping bed</li> <li>✓ Unoccupied bed</li> <li>✓ Closed bed</li> <li>✓ Open bed</li> <li>✓ Occupied bed</li> <li>✓ Fracture bed</li> <li>✓ Anesthetic bed</li> <li>✓ Cardiac bed</li> <li>✓ Amputation bed</li> <li>✓ Baby crib</li> </ul>	
	<p><b>SDL Practice Areas (3 hr.)</b></p> <ul style="list-style-type: none"> <li>✓ Bed making</li> <li>✓ Body Mechanics</li> </ul>	
<b>Week 7</b>	<p><b>Lecture And Discussion: 5 hrs.</b></p> <p><b>Fundamental of Nursing ----- (2 hrs.)</b></p> <p><b>Essential assessment components</b></p> <ul style="list-style-type: none"> <li>✓ Measuring Vital signs</li> <li>✓ Pulse rate</li> <li>✓ Respiratory rate</li> <li>✓ Body Temperature (Oral, Axillary, Rectal, Tympanic)</li> <li>✓ Blood pressure</li> <li>✓ Measuring patient's body weight</li> <li>✓ Taking patient's height</li> <li>✓ Pain assessment</li> </ul>	<b>5 hrs./wk</b>
	<p><b>SDL: -----3 hrs.</b></p>	
	<ul style="list-style-type: none"> <li>✓ Vital sign</li> </ul>	

<p>Week 8</p>	<p><b>Lecture And Discussion: 6 hrs.</b>  <b>Nursing Ethics</b>  <b>Standards of nursing practice----- 2 hrs.</b>          ✓ Health illness and health care system          ✓ Bill of right  <b>Fundamental of Nursing</b>  <b>Oxygenation: Respiratory function -----2 hrs.</b>          ✓ Normal respiratory function          ✓ Altered respiratory function <b>First aid and emergency nursing</b>  <b>Poisoning -----2 hrs.</b>          ✓ Definition          ✓ Causes          ✓ Sign and Symptoms          ✓ Objective in treatment of first aid          ✓ Contact poisons          ✓ Carbon mono oxide poisoning          ✓ Prevention of Accidental poisoning          ✓ Anaphylactic reaction</p>	<p><b>6 hrs./wk</b></p>
<p><b>Week 9</b></p>	<p><b>Lecture And Discussion: 6 hrs.</b>  <b>First aid</b>  <b>Oxygenation and ventilation ----- (3hrs.)</b>          ✓ Measuring oxygen saturation          ✓ Methods of oxygen Administration          ✓ Air way suctioning          ✓ Nasopharyngeal          ✓ Oropharyngeal          ✓ Endotracheal          ✓ Tracheostomy care          ✓ Postural drainage and water seal drainage          ✓ Thoracentesis          ✓ Prepare nursing care plan for client with problem oxygenation</p>	<p><b>6 hrs.</b></p>
	<p><b>SDL: 3 hrs.</b>          ✓ Oxygen administration,          ✓ Suctioning          ✓ Tracheostomy care,          ✓ Chest physiotherapy          ✓ Chest tube care          ✓ Thoracentesis          ✓ Postural draining</p>	

<b>Week 10</b>	<b>Lecture Hour 8 hrs.</b> <b>First aid and emergency nursing – 4 hrs.</b> Artificial respiration, ✓ Respiratory and Cardiac Emergencies	<b>8 hrs./wk</b>
	<ul style="list-style-type: none"> <li>✓ Respiratory Emergency</li> <li>✓ Definition respiratory failure</li> <li>✓ Classification of respiratory failure</li> <li>✓ Cause of respiratory failure</li> <li>✓ Artificial respiration</li> <li>✓ Cardiac arrest</li> <li>✓ Shock ✓ CPR</li> </ul> <b>Bleeding control -----2 hrs.</b> <ul style="list-style-type: none"> <li>✓ First aid for bleeding</li> <li>✓ First Aid for wounds</li> <li>✓ Prevention of contamination and infection of Wounds</li> <li>✓ Prepare nursing care plan for client with shock</li> </ul>	
	<b>SDL: First aid ----- 2 hrs.</b> <ul style="list-style-type: none"> <li>• Bleeding control</li> <li>• Emergency wound management</li> <li>• CPR</li> </ul>	
<b>Week 11</b>	<b>Lecture Hour 11 hours.</b> <b>Fundamental of Nursing</b> <ul style="list-style-type: none"> <li>✓ Medication and fluid therapy ----- (4 hrs.)</li> <li>✓ Medication preparation <ul style="list-style-type: none"> <li>✧ Withdrawing Medication from a Vial</li> <li>✧ Withdrawing Medication from an Ampoule</li> <li>✧ Mixing Medications from Two Vials into One Syringe</li> <li>✧ Preparing an IV Solution</li> <li>✧ Medication calculation</li> </ul> </li> </ul> <b>Medication administration</b> <ul style="list-style-type: none"> <li>✓ Administering Oral, Sublingual, and Buccal Medications</li> <li>✓ Administering Eye and Ear Medications</li> <li>✓ Administering Skin/Topical Medications</li> <li>✓ Administering Nasal Medications</li> <li>✓ Administering Rectal Medications</li> <li>✓ Administering Vaginal Medications</li> </ul> <b>First aid and emergency -----3 hrs.</b> <ul style="list-style-type: none"> <li>✓ Disaster prevention and management</li> <li>✓ Mass causality triage</li> </ul>	<b>11 hrs./wk</b>



	<b>SDL: -----4 hrs.</b> ✓ Medication administration ✓ Carbon mono oxide poisoning management	
<b>Week 12</b>	<b>Lecture Hour 6 hours.</b> <b>Fundamental of Nursing</b> <b>Medication and fluid therapy (4 hrs.)</b> ✓ Administering Nebulized Medications	<b>6 hrs./wk</b>
	✓ Parenteral Medications administration ✓ Fluid therapy ✓ Setting an IV line ✓ IV fluid therapy ✓ Blood transfusion <b>First aid -----2 hrs.</b> ✓ Foreign body removal ✓ Foreign body on the eye ✓ Foreign body on the ear ✓ Foreign body on the nose	
	<b>SLD: Fluid Administration and Calculation 2 hrs.</b>	
<b>Week 13</b>	<b>Lecture Hour 6 hrs.</b> <b>First aid and emergency nursing</b> <b>Specific injures----- 2hrs.</b> ✓ Eye injuries ✓ Neck injuries ✓ Open Wounds of the chest ✓ Abdominal injures ✓ Prepare nursing care plan for client with head injury <b>Animal bite and sting -----1 hr.</b> ✓ Definition, cause, S/S first aid management and prevention of: ✓ Human bite ✓ Dog bite ✓ Snake bite ✓ Scorpion bite ✓ Insects sting <b>First aid ----- 1hr.</b> Shock, sudden illness and unconsciousness	<b>6 hrs./wk</b>
	<b>SDL Practice Areas (2 hrs.)</b> ✓ <b>First aid:</b> Wound & bleeding control (1 hr.) ✓ <b>Fundamental:</b> Blood Transfusion (1 hr.)	

<b>14 week</b>	<b>Interactive lecture and discussion</b> <b>Fundamentals Nursing ..... 3 hrs.</b> <b>Loss &amp; grieving</b> ✓ Breaking bad ✓ Normal grieve function ✓ Altered grieve function <b>First aid</b> ✓ Dressing and Bandages ----- 1hr.	<b>4 hrs./wk</b>
<b>15 week</b>	<b>Interactive lecture and discussion---7 hrs. Firs</b> <b>aid and emergency nursing 4 hrs.</b>	<b>7 hrs./wk</b>
	✓ Head injury ✓ Spinal cord injuring ✓ Approach to patients with trauma	
	SDL: 3 hrs. ✓ First aid kit preparation ✓ Moving and lifting of patients with cervical injury ✓ Neck collar application ✓ BLS (ABC of life)	
<b>Week 16- 19</b>	<b>Hospital Practice</b>	
<b>Week 20</b>	<b>Exam and OSCE</b>	

## References

1. Fente Ambaw: Lecture note on Health assessment for health science students
2. American Red Cross standard first Aid and Personal Safety, 2<sup>nd</sup> ed. New York 1979.
3. Alemaya University, lecture notes, Alemayehu Galmessa, First Aid and Accident Prevention for Nurses
4. Warner. C. Germanie. Emergency cares Assessment and intervention 3<sup>rd</sup> Ed. The C.V Mosey Comp. London 1983
5. Brunner and Suddarth's Text Book of Medical Surgical Nursing, 21 th Edition

## Fundamental of nursing practicum I (Week 16-19)

- ❖ By the end of this module, the students will be able to do basic nursing care by applying knowledge, attitude and skills of fundamental nursing, first aid, biomedical sciences and pharmacology in the nursing practice.
- ❖ To meet the above module objective, the students are expected to:
  - ❖ Perform nasogastric tube insertion
  - ❖ Discuss nutrition and metabolism patterns of patients under nursing care
  - ❖ Administer enema for patient with altered bowel function
  - ❖ Document information's according to principles of proper recording and documentation
  - ❖ Provide colostomy or ileostomy care
  - ❖ Perform urinary catheter for patient with altered urinary function
  - ❖ Apply nursing process using Gordon approach
  - ❖ Provide nursing care of patients with altered skin integrity
  - ❖ Apply nursing process for altered sexual functions
  - ❖ Explain the purpose of nursing process using Gordon approach procedure (Gastrointestinal system (GIS), genitourinary system (GIS), Reproductive system (RS), Integumentary system (IS), Endocrine system (ES) and Nervous system (NS))

### List of activities/procedures

S.N	List of activities/procedures
1.	General observation of the clinical environments
2.	<b>Infection prevention and patient safety practices</b>
3.	<b>Body mechanics and mobility</b>
4.	Assisting patient with assistive devices
	Participating in crutch walking teaching
5.	<b>Bed making</b>
6.	<b>Medication administration and fluid therapy</b>
7.	<b>Dose calculation</b>
8.	<b>Medication administration</b>

9.	<b>Fluid therapy</b>
10.	<b>Collection and care of specimen</b>
11.	<b>Taking vital signs ( all )</b>
12.	<b>Instrument processing</b>
13.	<b>Applying patient safety device and comfort</b>
14.	<b>Wound care</b>
15.	Burn care
16.	Bleeding management
17.	Bone and joint injuries
18.	Emergency care
19.	ABC of life
20.	Managing drowning
21.	Managing client in choking
22.	Heimlich maneuver
23.	<b>Oxygenation &amp; Ventilation</b>
24.	Care of patients with chest water seal drainage system
Assessment methods	<ul style="list-style-type: none"> <li>• Direct Observation of Procedural Skills (DOPS) --- 20% □ Mini-clinical evaluation exercise (mini-CEX) -----20%</li> <li>• Clinical encounter cards (CEC)-----20%</li> <li>• Review of logbook -----10 %</li> <li>• OSCE/Oral exam----- 20%</li> <li>• Seminar presentation ----- 10%</li> </ul>
Working units	<ul style="list-style-type: none"> <li>• Emergency OPD</li> <li>• OPD and Specialty Clinics</li> <li>• Wards and Procedure rooms</li> <li>• Follow-up Units</li> <li>• Others</li> </ul>

## DETERMINANTS OF HEALTH MODULE

<b>Module Name</b>	<b>Determinants of Health</b>
<b>Module code</b>	❖ SPHM-2022
<b>Module ECTS.</b>	❖ 3 crh 2
<b>Duration</b>	❖ 16 week
<b>Lecture Hours</b>	❖ 29hrs
<b>Community practice hours</b>	❖ 24 (8 hr./ week for 3 weeks along with Clinical practice)
<b>Module description</b>	❖ This module is designed to equip comprehensive nurses with the knowledge, attitude and skills on determinants of health at community and health facility level. It also equips them with general concepts related to environmental control activities relevant to health promotion and disease prevention with focus on the control of water supply, waste management, control of insects and rodents, food hygiene & housing.
<b>Module competency</b>	After completion of this module, comprehensive nursing students will be competent <ul style="list-style-type: none"> <li>❖ Identify psycho-social, environmental and behavioral determinants of health.</li> <li>❖ Participate on prevention and control rodents and vector born illness</li> <li>❖ Implement principles of safe waste management</li> </ul>
<b>Module Objective</b>	❖ At the end of this module, the comprehensive nursing student will be able to acquire knowledge and skills needed to identify and intervene psycho-social, environmental and behavioral determinants of health.

<b>Instructional Objectives</b>	<p>By the end of the module, students will be able to:</p> <ul style="list-style-type: none"> <li>❖ Analyze socio-cultural determinants of health and disease at individual, family and community level</li> <li>❖ Analyze socio-economic determinants of health and disease at individual, family and community level</li> <li>❖ Analyze psychological and behavioral determinants of health and disease at individual, family and community level</li> <li>❖ Analyze environmental determinants of health and disease at individual, family and community level</li> <li>❖ Describe the relationship of human beings to their environment in relation to health.</li> <li>❖ Apply the basic principles of environmental control</li> <li>❖ Instruct individuals, groups, and communities on proper human excreta and refuse disposal, water source protection &amp; storage</li> </ul>
<b>Teaching Methods</b>	<ul style="list-style-type: none"> <li>❖ Interactive lecture and discussion</li> <li>❖ Small group learning activities: assignment, exercise, case study</li> <li>❖ Individual reading</li> <li>❖ Student presentation</li> <li>❖ Personal research and reflection exercise (PRRE)</li> <li>❖ Reflective portfolio and mentoring</li> </ul>
<b>Teaching-Learning Materials</b>	<ul style="list-style-type: none"> <li>❖ (LCD and computer and, writing board and marker/chalk)</li> <li>❖ Handouts of lecture materials</li> <li>❖ Logbooks for entry of community experience</li> </ul>
<b>Assessment Methods</b>	<ul style="list-style-type: none"> <li>❖ Exercise and assignment</li> <li>❖ Logbook and portfolio</li> <li>❖ 360-degree evaluation</li> <li>❖ Student presentation</li> <li>❖ Global rating of community experience midway during the module</li> </ul>
<b>Assessment</b>	<ul style="list-style-type: none"> <li>❖ Class room-based teaching (theory) = 60% (Written exam)</li> <li>❖ Community attachment (40 %) along with clinical practice</li> <li>❖ Review of Reflective portfolio (10%) (Review of works/activities/tasks /projects/assignments etc...completed by students.</li> <li>❖ Direct observation of performance (individual/group) = 20 %</li> <li>❖ Other performance (seminar etc.) =10%</li> </ul>

<b>Module policy</b>	<ul style="list-style-type: none"> <li>❖ Lecture and tutorial attendance is mandatory.</li> <li>❖ Student should submit assignment reports on due date</li> <li>❖ Student should take all continuous assessments as scheduled. If he/she misses quiz or assignment, will be treated according to college legislation.</li> <li>❖ Student should do his/her own work. If he/she is caught red-handed while cheating, he/she will be treated according to college legislation</li> </ul>
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**Module Schedule**

Weeks	Units to be covered	Contents	Time
1 -4	Introduction to determinants of health (Social, psychological and behavioral determinants)	<p><b>Interactive Lecture</b></p> <p>Understanding health, illness and disease and healing: sociological, psychological and anthropological perspective</p> <p><b>Social and cultural determinants of health</b> (community and social context, neighborhood and physical environment, educational status, economic stability (unemployment, poverty, income inequality, neighborhood deprivation, assets, economic growth, globalization)</p> <p>Health care system (health coverage, health care cost, provider availability, quality of care)</p> <p>Urbanization, culture, religion, ethnicity, gender views and roles, status of women, demography, social structures (mobility and migration) and organizations (social cohesion, support and network), laws, human rights</p> <p>Alternative and complementary medicine</p> <p><b>Psychological determinants of health and illness</b> Motivation, Stress, Pain, Personality</p>	

	<p><b>Conflict and health</b></p> <p><b>Behavioral determinants</b></p> <p>The role of behavior in health</p> <p>Smoking</p> <p>Physical activity</p> <p>Eating behavior</p> <p>Alcohol and drug use</p> <p>Sexual health and behavior</p>	3 hrs. /Wk
Environmental determinant of health	<p><b>Introduction to environmental health</b></p> <p>Definitions of terms and scope of Environmental health</p> <p>Global aspects, issues and history of environmental health</p> <p><b>Introduction to safe water supply</b></p> <p>Definitions</p> <p>Source of water</p> <p>Importance</p> <p>Water and water related diseases</p>	
	<p>Protection and treatment of water sources</p> <p>Water pollution and its effects</p>	



5-7	Food Hygiene	<b>Principles and methods of food processing and preservation</b> Definitions Food And Disease Prevention of food borne diseases Sanitation of Food and Beverages Inspection of food and drink service establishment	3hrs./wk
	Waste management	<b>West management</b> Definitions Classification and types of solid waste Options of solid waste management Effects of solid waste mismanagement Managing excreta and sewage disposal Methods of excreta and sewage disposal Faecal borne diseases Gaseous waste management	
8-10	Housing and institutional Health	<b>Introduction to Housing and institutional health</b> Housing Definition of terms Basic housing principles Public health importance Criteria for an adequate village house Certain basic elements of housing standards <b>Institutional health or sanitation</b> <b>School health</b> <b>Prison Health, Hospital, Health center, etc</b>	2 hrs./wk

11		<p>Vector borne diseases</p> <p>Prevention and control of vectors</p> <p>Rodent control</p> <p>Identification</p> <p>Investigation of rodent infestation</p> <p>Diseases transmitted by rodents</p> <p>Prevention and control of rodents</p> <p>Ways of transmission of vector borne diseases</p>	2 hrs./wk
12	Occupational Health and Safety	<p>Introduction</p> <p>Definition of terms</p> <p>The scope of occupational health, and safety</p> <p>Elements of the work environment</p> <p>Classification of occupational health hazards</p> <p>Occupational health hazard control</p>	2 hrs./wk
13	Exam week	Module Completion and Examination	
Week 14-16		<p><b>Community practice along with Clinical practice</b></p> <p>Objective</p> <p>To analyze social, psychological, behavioral and environmental determinants of health and disease at individual, family and community level To analyze social, psychological, behavioral and environmental determinants of health and disease at health facility level</p> <p>Identify and interpret these determinants of health Design strategies to promote health and prevent disease</p>	8 hrs./wk

## Reference Books

1. Yemane Berhane, Damen Hailemariam and Helmu Kloos. Epidemiology and ecology of Health and Disease in Ethiopia. 2006
2. EPHTI. Ecology. Lecture note series for health science students. 2007
3. White, P. Biopsychosocial medicine: An integrated approach to understanding illness. 2005 Oxford University Press.
4. Frankel, R. M., Quill, T. E., & McDaniel, S. H. Biopsychosocial approach: Past, present, future. 2003. University of Rochester Press.
5. Singer, M. & Baer, H. A. Introducing medical anthropology: A discipline in action (2nd ed.) 2011. Rowman Littlefield
6. Bernice A. Pescosolido, Jack K. Martin, Jane D. McLeod, Anne Rogers (Editors). Handbook of the Sociology of Health, Illness, and Healing. A Blueprint for the 21st Century. 2011
7. Bird, C. E., Conrad, P., Fremont, A. M., & Timmermans, S. Handbook of medical sociology (6th ed.) 2010. Vanderbilt University.
8. Sobo, E. J. & Loustanaun, M. Cultural context of health, illness, and medicine (2nd ed.) 2010. Greenwood
9. David French et al. Health psychology (2nd ed.) 2010. Blackwell Publishing
10. By Susan Ayers, Richard de Visser. Psychology of medicine. 2011
11. WHO. Closing the gap in a generation: health equity through action on the social determinants of health: final report of the commission on social determinants of health. 2008.
12. Robert H Friis. Essentials of environmental health (2nd edition). The essential public health series. 2012.
13. Kathryn Hilgenkamp. Environmental Health: Ecological Perspectives. 2006
14. Herman Koren and Michael Bisesi. Handbook of environmental health. 200

## BIOMEDICAL SCIENCE II

Module Name: Biomedical science II

Module Code: BioM-2032

ETCTS: 10

Credit hour: 6

<b>Module summary</b>	<b>Weeks</b>	<b>Total hours</b>	<b>ECTS</b>
Total module duration	15	127	
Class room based teaching (lecture)	15	107	
SDL (clinical and biomedical lab ) teaching	2	19	
Exam period	1		
<b>Course Contents contributed to the module</b>	<b>Hour Load</b>	<b>% Emphasis</b>	<b>ECTS</b>
Human Anatomy	26	23 %	2.5
Human Physiology	19	23 %	1.5
Medical Parasitology	13	11%	1
Pharmacology	20	15%	2
Medical Microbiology	8	4 %	0.5
Medical Biochemistry	9	6 %	0.5
Pathophysiology	11	13 %	1
Biomedical skill lab	19	5 %	1
<b>Total</b>	<b>126</b>	<b>100%</b>	<b>10 ECTS</b>

### **Module Description:**

This module is designed for BSc Nursing students to foster opportunity to learn the theoretical background of human Anatomy, physiology and pharmacology of Gastrointestinal system (GIS), Genitourinary system (GIS), Reproductive system (RS), Integumentary system (IS), Endocrine system (ES) and parasitology and biochemistry for nursing practice.

### **Module Outcome**

- By the end of this module, the students will be able to provide basic nursing care related to Gastrointestinal system (GIS), Genitourinary system (GIS), Reproductive system (RS), Integumentary

system (IS), and Endocrine system (ES) by applying knowledge, attitude and skills of fundamental nursing, biomedical sciences, pathophysiology and pharmacology in the nursing practice.

### **Supporting Objectives**

To meet the above module objective, the students are expected to:

- Identify the anatomical structure of Gastrointestinal system (GIS), Genitourinary system (GIS), Reproductive system (RS), Integumentary system (IS), and Endocrine system (ES)
- Explain/recognize the functions of Gastrointestinal system (GIS), Genitourinary system (GIS), Reproductive system (RS), Integumentary system (IS), and Endocrine system (ES)
- Discuss the pharmacotherapeutics of drugs (PD and PK) classification, mechanism of action, used in the management of Gastrointestinal system (GIS), Genitourinary system (GIS), Reproductive system (RS), Integumentary system (IS), and Endocrine system (ES)
- Describe the structure and classification of macro and micro molecules (carbohydrates, fat and protein, vitamins and minerals)
- Describe the functions and metabolism of macro and micro molecules (carbohydrates, fat and protein, vitamins and minerals)
- Discuss the life cycle of parasitic infections
- Describe some important arthropods responsible for the transmission of disease causing parasites
- Describe the transmission and pathogenesis of helminthes, parasites and protozoan infections and how to control
- Describe the etiology, pathogenesis and presenting symptoms and sign of common health problems in humans.
- Discuss normal and abnormal compensatory mechanisms of the body that occur in response to disease processes.
- Analyze rationale for treatment modalities based on etiology, pathogenesis, and clinical manifestations of common health problems.
- Determine the abnormal cell and tissue reactions

### **Teaching and learning methods**

- Interactive lecture
- PBL
- Small group discussion
- Role play
- Case study

- Clinical simulation
- Video show
- Demonstration

### **Assessment methods Formative**

**(60%)**

- Quiz
- Written test
- OSCE
- PBL progressive assessment

Summative assessment of the overall module (40%)

- Written test =25%
- PBL=5%
- OSCE =10%
- Total = 40%

### **REFERENCES**

1. Human anatomy and physiology, Tortora (11edition 11edition) pp.1-107)
2. Tortora, G.J. & Bryan D. 11<sup>th</sup> edition. Principles of Anatomy & Physiology
3. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy
4. Langman J & Woerdeman M.W (1978). Atlas of medical Anatomy
5. W.Henry Hollinshead 4<sup>th</sup> ed. Text Book of Anatomy
6. Frederic H.Martini,7<sup>th</sup> edition. Fundamentals of human anatomy & physiology
7. Monica Cheesbrough. District Laboratory Practice in Tropical countries. Part I -2nded updated. 1998. Tropical Health Technology. Cambridge Judith S. Heelan, Frances W. Ingersoll. Essentials of Human Parasitology. 2002. Delmar Thomson Learning
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13. Medical microbiology (Brooks GF, Butel JS, Morse S.A. Jawetz: 21st edition)
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15. Monica Cheesbrough, Medical Laboratory Manual for tropical countries Volume I
16. Monica Cheesbrough, Medical Laboratory Manual for tropical countries Volume II
17. Medical Microbiology and Immunology for health science students (Gebresilassie S. et. al. Lecture note series, 2005)
18. Medical Microbiology and Immunology; Levinson W, Jawetz E.6th Ed edition. 2000
19. Abul K. Abbas Andrew H. Lichtman, Cellular and Molecular Immunology, 5th edition
20. Goldsby et al, CUBEY Immunology, 5th edition
21. Bauer,D.John, Clinical Laboratory Method 9th ed,1982.
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23. Thompson R.B.S.I. Proctor, A short test book of Hematology 6th ed. 1985.
24. District laboratory practicein tropical countries. 2nd ed. Part I. Monica Cheesbrough, 2005
25. Text book of urinalysis and body fluids. Doris LR, Ann EN, 1983
26. Norbert L W. Tietz, Fundamental of clinic Chemistry, 2nd ed, 1984
27. Text book of urinalysis and body fluids. Doris LR, Ann EN, 1983
28. Urinalysis and body fluids: A color text and atlas. Karen MR, Jean JL. 1995
29. Clinicalchemistry: Principles, procedures, correlation. 3rd ed. Michael L. Bishop et al. 1996

### **Module schedule**

- Lecture and discussion = 14hr/week for 15 weeks
- PBL=4hr/week for 6 weeks
- SDL (clinical and Biomedical) =8hr/week for 12 weeks
- Self-study

Date/Week	Learning Activity	Required Reading (Assignment)
Week 1	<p><b>Interactive lecture and discussion...9 hrs.</b>            Anatomy of digestive system ----- 2 hrs.            Physiology of digestive system ----- 3 hrs.  <b>Biochemistry ----- 2 Hrs.</b>            ✓ Tricarboxylic acid (Krebs') cycle            ✓ Bioenergetics (thermodynamics)            ✓ Related to nutrition and obesity            ✓ The Electron transport system            ✓ Oxidative phosphorylation  <b>Pathophysiology ----- (1 hrs.)</b>            ✓ Introduction to inflammation            ✓ Cellular response to injury</p> <p><b>Biomedical lab.</b> Anatomic charts ----- (1 hrs.)</p>	9 hrs./wk
Week 2	<p><b>Interactive lecture and discussion... 6 hrs.</b>  <b>Pathophysiology ----- (2 hrs.)</b>            ✓ Immunopathology            ✓ Hemodynamic Disorders  <b>Microbiology -----4 hrs.</b>            ✓ Bacteriology            ✓ Virology</p>	6 hrs./wk
Week 3	<p><b>Interactive lecture and discussion... 6 hrs. Biochemistry</b>  <b>LIPID -----2 hrs.</b>  <b>Pharmacology----- (2 hrs.)</b>            ✓ Pharmacotherapy of peptic &amp; duodenal ulcer            ✓ Pharmacotherapy of emesis            ✓ Symptomatic treatment of constipation <b>Microbiology</b>  <b>-----2 hrs. ✓ Host parasite relationship</b>            ✓ Antimicrobial chemotherapy</p>	6 hrs./wk
Week 4	<p><b>Interactive lecture and discussion... 11 hrs.</b>  <b>Anatomy ----- 4 ✓</b>            Cellular organization of the body</p>	11 hrs./wk



	<ul style="list-style-type: none"> <li>✓ Basic histology</li> <li>✓ Connective tissue</li> </ul> <p><b>Microbiology ----- 2 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Acquired infections</li> <li>✓ Mycology</li> </ul> <p><b>Pathophysiology -----1 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Immunopathology</li> <li>✓ Hypersensitivity Disorders</li> </ul>	
	<p><b>Biomedical lab -----4 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ media and inoculation technique</li> <li>✓ staining</li> <li>✓ Reading growth of bacteria</li> <li>✓ Biochemical and antimicrobial susceptibility testing</li> </ul>	
<b>Week 5</b>	<p><b>Interactive lecture and discussion.....9 hrs.</b></p> <p><b>Anatomy -----4 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ General embryology</li> </ul> <p><b>Physiology</b></p> <p>Energy and Metabolism ----- 1 hrs.</p> <p><b>GIT Pharmacology----- (2 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Antimicrobial drugs of GIT</li> <li>✓ Anti-helminthic drugs of GIT ✓ Anti-protozoal drugs of GIT</li> </ul> <p><b>Pathophysiology -----2 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Alterations in Fluids, Electrolytes, and Acid Base Balance</li> <li>✓ Hemodynamic Disorders</li> </ul>	<b>9 hrs./wk</b>
<b>Week 6</b>	<p><b>Interactive lecture and discussion- cont....-- 10 hrs.</b></p> <p><b>Anatomy of reproductive organs ----- (4 hr.)</b></p> <ul style="list-style-type: none"> <li>✓ Male reproductive System</li> <li>✓ Female reproductive system</li> </ul> <p><b>Physiology reproductive system-----4 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Female reproductive organs</li> <li>✓ Male reproductive organs</li> </ul> <p><b>Pathophysiology -----2 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Hemodynamic of body system</li> </ul>	<b>10 hrs. /wk</b>

<b>Week 7</b>	<b>Interactive lecture and discussion ... 9 hrs.</b> <b>Parasitology ..... 4 hrs.</b> ✓ Tematodes /The flukes/ ✓ General characteristics ✓ Classification (blood, liver & intestinal flukes) ✓ Blood flukes ✓ Schistosoma mansoni ✓ Schistosoma haematobium <b>Pharmacology----- (4 hrs.)</b>	<b>9 hrs./wk</b>
	✓ Pharmacology of reproductive system ✓ Sexual hormones (hormonal contraceptives) ✓ Oxytocic drugs (ergometrine, oxytocin) ✓ Contraceptive drugs <b>Biochemistry ----- PROTEINS ..... 1 hrs.</b> ✓ Structure and classification of amino acids ✓ Physico-chemical properties of amino acids ✓ Structure & functions of proteins ✓ Mechanism of oxygen binding to myoglobin and hemoglobin.	
<b>Week 8</b>	<b>Interactive lecture and discussion ...7 hrs.</b> <b>Anatomy of integumentary system ----2 hrs.</b> <b>Parasitology -----4 hrs.</b> <b>Protozoa</b> ✓ General Morphology ✓ Life Cycle ✓ Classification <b>The Amoeba:</b> ✓ Alimentary canal ✓ General characteristics ✓ Entamoeba histolytica/ dispar  <b>Biomedical lab -----1 hr. ✓</b> Anatomic charts	<b>7 hrs./wk</b>
<b>Week 9</b>	<b>Interactive lecture and discussion cont. .... 9 hrs.</b> Anatomy of Urinary System ----- 2 hrs. Urinary System physiology -----4 hrs. ✓ Acid base balance ✓ Concentration and dilution of urine <b>Pharmacology of urinary system ----- 2 hrs.</b> ✓ Drugs acting in urinary system ✓ Chemotherapy of microbial infections	<b>9 hrs./wk</b>

	<b>Biomedical lab. ----- (1 hrs.)</b> ✓ Anatomical charts and atlas ✓ Computer assisted simulations and video shows	
<b>Week 10</b>	<b>Interactive lecture and discussion .....8 hrs.</b> Anatomy of brain ----- 1 hr. Anatomy of spinal cord -----1 hr. Physiology of brain -----2 hrs. Pathophysiology-----1 hrs. ✓ Hemodynamic Alterations of body system ✓ Heart failure & Hypertensive disorders in pregnancy ✓ Endocrine alteration in pregnancy and gestational diabetes mellitus <b>Parasitology</b> ✓ Protozoa: --- 1 hrs. Biomedical Lab-----Anatomic Charts (1 hrs.)	<b>8 hrs./wk</b>
<b>Week 11</b>	<b>Interactive lecture and discussion .... 9 hrs.</b> <b>Anatomy</b> <b>Joint and articulation -----2 hrs.</b> <b>Biochemistry ..... 2 hrs.</b> ✓ Fat soluble vitamins ✓ Insoluble vitamins <b>Pathophysiology of connective tissue ----- 1 hr.</b> <b>Parasitology .....</b> ✓ The Leishmania ----- 2 hrs.	<b>9 hrs./wk</b>
	<b>Basic science lab</b> ✓ General microbiology lab----- 2 hrs.	
<b>Week 12</b>	<b>Interactive lecture and discussion .... 9 hrs.</b> ✓ Anatomy of endocrine system -----2 hrs.) ✓ Physiology of Endocrine system ----- 3 hrs. ✓ Pharmacology of Endocrine system .....2 hrs.	<b>9 hrs./wk</b>
	<b>Biomedical lab</b> ✓ Anatomy Lab. -----1 hrs. ✓ Physiology lab -----1 hrs.	

<b>Week 13</b>	<b>Interactive lecture and discussion .... 9 hrs.</b> Anatomy <ul style="list-style-type: none"> <li>• Anatomy of the integumentary system -----2 hrs.</li> <li>• Physiology of integumentary system -----3 hrs.</li> </ul> Biochemistry .....2 hrs. <ul style="list-style-type: none"> <li>✓ Minerals</li> <li>✓ Water</li> <li>✓ Acid base theories</li> </ul> <b>Pathophysiology</b> <ul style="list-style-type: none"> <li>✓ Connective tissue pathologies -----1 hr.</li> </ul>	<b>9 hrs./wk</b>
	<b>biomedical lab.</b> Physiology <ul style="list-style-type: none"> <li>✓ Body fluid PH analysis -----1 hrs.</li> </ul>	
<b>Week 14</b>	<b>Interactive lecture and discussion .... 9 hrs.</b> <b>Pathophysiology -----3 hrs. ✓</b> Skin malfunctioning <ul style="list-style-type: none"> <li>✓ Central nervous system alterations</li> <li>✓ Endocrine Pathology</li> </ul> <b>Pharmacology Chemotherapy -----6 hrs.</b> <ul style="list-style-type: none"> <li>✓ Chemotherapy of microbial infections</li> <li>✓ Chemotherapy of protozoa infections</li> <li>✓ Chemotherapy of fungal infections</li> <li>✓ Chemotherapy of Virus</li> </ul>	<b>9 hrs./wk</b>
<b>Week 15</b>	<b>Interactive lecture and discussion ....10 hrs.</b> <b>Parasitology ..... 2 hrs.</b> <ul style="list-style-type: none"> <li>✓ Protozoa</li> </ul> <b>Pharmacology</b> <ul style="list-style-type: none"> <li>✓ Antidote Pharmacology -----2 hrs.</li> </ul> <b>Biomedical Lab -----6</b> <b>Anatomic chart summary</b> <b>Parasitology Summary lab</b> <b>Microbiology summary lab</b>	<b>10 hrs./wk</b>
<b>Week 16</b>	<b>Final Exam</b>	

## FOUNDATION OF NURSING II

Module Name: Foundation of Nursing II

Module Code: NursM-2043

ETCTS: 13

Credit hour: 8

Module summary

	<b>Weeks</b>	<b>Total hours</b>	<b>ECTS</b>
Total module duration	16	320	
Class room based teaching (lecture)	15	118	
PBL	9	22	
SDL (clinical and biomedical lab ) teaching	7	20	
Exam period	<b>1 week</b>		
<b>Course Contents contributed to the module</b>	<b>Hour Load</b>	<b>% Emphasis</b>	
Fundamental of Nursing	45	14	4
ORT	42	13	3.5
PBL	22	7	2.5
SDL (Skill lab and demonstration )	20	6 %	1
Hospital Practicum	191	60%	2.6
Total	<b>320</b>	<b>100%</b>	<b>13 ECTS</b>

### **Module Description:**

This module is designed for BSc Nursing students to foster opportunity to learn the core fundamental concepts nursing by applying the basic and advanced nursing care of clients. The module describes the core nursing care of clients with the functional health patterns specifically sleep and rest, nutrition and metabolism, activity and exercise, cognitive and perceptual, sexuality and reproductive and elimination pattern. The module also enables learners with adequate knowledge, skill and attitude required to apply fundamental nursing care for patients using nursing process as a framework.

## **Module Objective**

By the end of this module, the students will be able to provide basic nursing care related to by applying knowledge, attitude and skills of fundamental nursing

## **Supporting Objectives**

To meet the above module objective, the students are expected to:

- Discuss sleep and rest patterns of patients under nursing care
- Demonstrate nasogastric tube insertion
- Discuss nutrition and metabolism patterns of patients under nursing care
- Demonstrate therapeutic and diagnostic procedure, and tests (Gastrointestinal system (GIS), Genitourinary system (GIS), Reproductive system (RS), Integumentary system (IS), and Endocrine system (ES))
- Demonstrate cast application and removal
- Assisting patients with advanced procedures
- Discuss elimination patterns of patients under nursing care
- Demonstrate administration of enema
- Demonstrate colostomy care
- Demonstrate urinary catheterization
- Discuss human sexuality
- Interpret the normal and the abnormal organized (liver function tests, renal function tests, blood glucose and DM tests, and urine sediments)
- Identify the different types of surgical instruments
- Demonstrate receiving and positioning of surgical patients
- Describe the roles of nurses in the pre, intra and postoperative phases of patient care.
- Distinguish the difference between general and local anesthesia
- Demonstrate how to pass instrument/sharps to the surgeon or his/her assistant □ Demonstrate care of terminally ill patients

## **Teaching and learning methods**

- Interactive lecture
- PBL
- Small group discussion
- Role play

- Case study
- Clinical simulation
- Video show
- Demonstration

### **Assessment methods Formative**

**(60%)**

- Quiz
- Written test
- OSCE
- PBL progressive assessment

Summative assessment of the overall module (40%)

- Written test =25%
- PBL=5%
- OSCE =10%
- Total = 40%

### **REFERENCES**

1. Brunner and Suddarth's Text Book of Medical Surgical Nursing, 16<sup>th</sup> Edition
2. Ruth F. Craven, Constance J. Hirnle Fundamentals of nursing: human health and function Julia M. Leahy, Patricia E. KiZilay. Foundations of nursing practice
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5. Gloria Grippanda (1986) Nursing perspective & issues
6. OZANIC I (1961) Nursing in Ethiopia by the Ethiopian nurse association Addis Ababa
7. Fredrickson K. (1977) opportunity in nursing, a decision of National textbook company U.S.A
8. Joanna R. Fuller: Surgical Technology, Principles and Practice 2nd edition, W.B. Saunders Company Philadelphia 1986.
9. Prevention Guidelines for Healthcare Facilities in Ethiopia, February 2005.

10. Carol Tayler, Carol Lillis, Prescilla LeMone: Fundamentals of Nursing, The Art and Science of Nursing Care, third edition, Lippincott, 1997.
11. C. Barrie Williams: Basic Practical Surgery, Bristol Johnwright and Saunders 1971
12. Lichtiger Monte: Introduction to the Practice of Anesthesia, Hagerstown, Harper and Row 1974.
13. Hlsted, The Laboratory in clinical medicine interpretation and application, 2<sup>nd</sup> ed, 1989

### Module schedule

- Lecture and discussion = 14hr/week for 15 weeks
- PBL=4hr/week for 6 weeks
- SDL (clinical and Biomedical) =8hr/week for 12 weeks
- Self-study

Date/Week	Learning Activity	Required Reading (Assignment)
Week 1	<p><b>Interactive lecture and discussion... .....10 hrs</b></p> <p><b>Fundamentals Nursing ----- (4 hr)</b></p> <ul style="list-style-type: none"> <li>✓ Sleep and rest pattern</li> <li>✓ Thermoregulation</li> <li>✓ Cognitive processes</li> </ul> <p><b>Operating room technique</b></p> <ul style="list-style-type: none"> <li>✓ Operating theatre design and administration ---2</li> <li>✓ Introduction to operating room technique. -----2 hrs</li> </ul> <p><b>Surgical conscience -----( 2 hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Surgical conscience</li> <li>✓ Consent</li> <li>✓ Areas affected by surgical conscience</li> <li>✓ Protection of the patient</li> <li>✓ Situations that undermine surgical conscience</li> <li>✓ Legal aspects of surgery</li> <li>✓ Criminal responsibilities</li> </ul>	10 hrs./wk
	<ul style="list-style-type: none"> <li>✓ Common areas of negligence</li> <li>✓ Nursing responsibility</li> </ul>	



<b>Week 2</b>	<b>Interactive lecture and discussion...8 hr</b> <b>Operation theater nursing ----- 3 hrs</b> <ul style="list-style-type: none"> <li>✓ Surgical Asepsis</li> <li>✓ General surgical instrumentation</li> <li>✓ Receiving and positioning of surgical patients</li> </ul> <b>Fundamental of nursing</b> <b>Peri-operative patient care ----- 4 hrs</b> <ul style="list-style-type: none"> <li>✓ Pre-operative</li> <li>✓ Intra operative</li> <li>✓ Post-operative</li> <li>✓ Ongoing postoperative patient care</li> </ul>	<b>8 hrs./wk</b>
	<b>Clinical skills lab (1 hrs.)</b> ✓ Identification of surgical instruments	
<b>Week 3</b>	<b>Interactive lecture and discussion 12hr</b> <b>Fundamental of nursing -----2hrs</b> <ul style="list-style-type: none"> <li>✓ Safety security and emergency preparedness</li> </ul> <b>Oppression Room Theatre -----( 6hrs)</b> <ul style="list-style-type: none"> <li>✓ Hazards in the OR</li> <li>✓ Precautionary Measures</li> <li>✓ Teams in OR</li> </ul>	<b>12 hrs./wk</b>
	<b>PBL (4 hrs.):</b> Chronic pain	
<b>Week 4</b>	<b>Interactive lecture and discussion...8hr</b> <b>Oppression Room Theatre -----( 2hrs)</b> <ul style="list-style-type: none"> <li>✓ Central Sterile Services Department (CSSD)</li> </ul> <b>Fundamental of nursing -----(2 hrs)</b> <ul style="list-style-type: none"> <li>✓ Gastrostomy feeding</li> <li>✓ Parenteral feeding</li> <li>✓ Nasogastric Tube Insertion <ul style="list-style-type: none"> <li>◇ Gastric Lavage</li> <li>◇ Gastric Aspiration ◇ Gastric Gavage</li> <li>◇ Gastric Lavage</li> <li>◇ Nasogastric tube Removal</li> </ul> </li> <li>✓ Prepare nursing care plan for patient with problem of feeding</li> </ul>	<b>8 hrs./wk</b>
	SDL NG tube insertion and removal -----2 hrs PBL (4 hrs.) Organophosphate poisoning	

<p><b>Week 5</b></p>	<p><b>Interactive lecture and discussion----- 13</b>  <b>Oppression Room Theatre ----- (2 hrs.)</b>  ✓ Monitoring and Recording the Physiological Status  <b>Fundamental of nursing -----3 hrs.</b>  ✓ Cast application and removal of casts  ✓ traction application  ✓ fixation application  <b>Oppression Room Theatre</b>  ✓ <b>Principles of anesthesia----- (4 hrs.)</b>  ✓ Introduction  ✓ Types of anesthesia  ✓ Methods of administering  ✓ Stages of general anesthesia  ✓ Choices of anesthesia  ✓ Pre-medication</p>	<p><b>13 hrs./wk</b></p>
	<p><b>SDL, gowning and gloving 2hrs. PBL</b>  Epigastria pain----- (4 hrs.)</p>	
<p><b>Week 6</b></p>	<p><b>Interactive lecture and discussion- cont.... 14 hrs.</b>  <b>Fundamental of Nursing.....2 hrs.</b>  ✓ Bowel Elimination  ✓ Enema administrations  ✓ Colostomy irrigation and care  ✓ Prepare nursing care plan for patient with problem of bowel elimination  <b>Oppression Room Theatre -----2 hrs.</b>  ✓ Staff conduct and practice  ✓ Oppression theatre attire</p>	<p><b>14 hrs./wk</b></p>
	<p><b>Clinical skills lab ----- (4 hrs.)</b>  ✓ Enema administration  ✓ Rectal tube insertion and removal  ✓ Surgical attire , surgical scrub</p>	
	<p><b>PBL: - Constipation ----- (4 hrs.)</b></p>	

<p><b>Week 7</b></p>	<p><b>Interactive lecture and discussion ...10 hrs. Oppression Room Theatre-----4 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ <b>Micro surgical instruments</b></li> <li>✓ Suture Materials</li> <li>✓ Administering anesthesia to a patient</li> </ul> <p><b>Fundamental of nursing -----2 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Pain perception &amp; comfort</li> <li>✓ Sensory perception</li> <li>✓ Altered sensory function</li> <li>✓ Prepare nursing care plan for patient with problem of sensory perception</li> </ul>	<p><b>10 hrs. /wk.</b></p>
<p><b>PBL (4hrs): Abdominal pain</b></p>		
<p><b>Week 8</b></p>	<p>Interactive lecture and discussion ...12 hrs.</p>	<p>12 hrs./wk</p>
<p><b>Oppression Room Theatre -----6 hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Infection prevention in OR</li> <li>✓ Maintaining anesthesia during an operation</li> <li>✓ Hazards in anesthesia</li> </ul> <p>Fundamental of nursing -----1 hrs. ✓</p> <ul style="list-style-type: none"> <li>Palliative care</li> <li>✓ Geriatrics nursing care</li> </ul>		
<p><b>SDL Material processing ----- (2 hrs.)</b></p> <p><b>PBL Sexual Dysfunction ----- (4 hrs.)</b></p>		
<p><b>Week 9</b></p>	<p><b>Interactive lecture and discussion cont..... 10 hrs.</b></p> <p><b>Operation theatre nursing ----- 4hrs.</b></p> <ul style="list-style-type: none"> <li>✓ Introduction to ventilation</li> <li>✓ Cardiopulmonary resuscitation</li> <li>✓ Emergency drugs – protocols for use</li> <li>✓ Defibrillation</li> <li>✓ Fluid replacement therapy</li> <li>✓ Homeostasis – mechanisms for maintenance</li> <li>✓ Patients presenting with multiple pathology</li> <li>✓ Stress management</li> </ul> <p><b>Fundamental of nursing</b></p> <p>Therapeutic and diagnostic procedures -----2 hrs.</p> <p><b>Skill lab 4 hrs. Assisting with advanced procedures</b></p> <ul style="list-style-type: none"> <li>✓ Paracentesis</li> <li>✓ Thoracentesis</li> <li>✓ Liver Biopsy</li> <li>✓ Lumbar puncture procedure</li> <li>✓ Bone marrow aspiration</li> </ul>	<p><b>10 hrs./wk</b></p>

<b>Week 10</b>	<b>Interactive lecture and discussion .....10 hrs.</b> <b>Fundamental Nursing</b> <b>Urinary Elimination _____ 2hr</b> <ul style="list-style-type: none"> <li>✓ Female &amp; Male catheterization</li> <li>✓ Prepare nursing care plan for patient with problem of urinary elimination</li> <li>✓ Caring of patients with Neurologic disorder</li> <li>✓ super pubic catheter</li> </ul>	<b>10 hrs./wk</b>
	<b>Clinical skills lab ( 4hrs)</b> <ul style="list-style-type: none"> <li>✓ Catheterization (Male &amp; female )</li> <li>✓ Catheter removal</li> <li>✓ Bladder irrigation</li> </ul>	
	<b>PBL (4 hrs.): Dysuria</b>	

<b>Week 11</b>	<b>Interactive lecture and discussion ....6 hrs. Fundamental of nursing</b> Self-concept -----2 hrs. Sexuality -----1 hrs. Spirituality -----1 hrs.	<b>6 hrs./wk</b>
	<b>Clinical skills lab ----- (2hrs.)</b> <ul style="list-style-type: none"> <li>✓ Female catheterization</li> <li>✓ Perennial care</li> </ul>	

<b>Week 12</b>	<b>Interactive lecture and discussion .... 8 hrs.</b> <b>Fundamental of nursing (2 hrs.)</b> <ul style="list-style-type: none"> <li>✓ Blood glucose controlling</li> <li>✓ Prepare nursing care plan for patients with DM</li> </ul> <b>Fundamental of nursing -----2 hrs.</b> <ul style="list-style-type: none"> <li>✓ Sensory functioning</li> </ul> <b>Operation room theatre -----2hrs</b> <ul style="list-style-type: none"> <li>✓ WHO's 10 objectives for surgery</li> <li>✓ Instrument handling</li> <li>✓ Suture Materials and Needles</li> <li>✓ Positioning and operation</li> </ul>	<b>8 hrs./wk</b>
	<b>SDL: Clinical skills lab (2 hrs.)</b> <ul style="list-style-type: none"> <li>✓ Glucose monitoring</li> <li>✓ Diabetic care</li> </ul>	

<b>Week 13</b>	<b>Interactive lecture and discussion .... 10 hrs.</b> <b>Operation room theatre -----2 hrs.</b> <ul style="list-style-type: none"> <li>✓ Hazards in the operating theatre</li> <li>✓ Principles of Anesthesia</li> </ul>	<b>10 hrs./wk</b>
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	<b>Fundamental of nursing -----4 hrs.</b> <b>Fundamental of Nursing -----1 hrs.</b> <ul style="list-style-type: none"> <li>✓ Care of terminally ill patients</li> <li>✓ Organ donation</li> </ul> Major procedures <ul style="list-style-type: none"> <li>✓ Paracentesis</li> <li>✓ Thoracentesis</li> <li>✓ Liver Biopsy</li> <li>✓ Lumbar puncture procedure</li> </ul>	
	<b>Skill Lab – Major therapeutic procedures----- 4 hrs.</b>	
<b>Week 14</b>	<b>Interactive lecture and discussion .... 10 hrs.</b> <b>Fundamentals of nursing</b> <b>Economic use of resource -----1 hrs. Care of persons personal property ---- 1hr Coping and stress management 4 hrs. ✓ Breaking bad news</b> <ul style="list-style-type: none"> <li>✓ Patient education and sympathy</li> <li>✓ Normal coping &amp; adaptation to stress</li> <li>✓ Altered coping &amp; adaptation to stress</li> </ul>	10 hrs./wk
	<ul style="list-style-type: none"> <li>✓ Therapeutic counseling</li> </ul>	
	<b>SDL: (4 hrs.)</b> <ul style="list-style-type: none"> <li>✓ Wound care</li> <li>✓ Suturing</li> <li>✓ Suture removal</li> </ul>	
<b>Week 15</b>	<b>Interactive lecture and discussion .... 9 hrs.</b> Fundamental of nursing -----2 hrs. <ul style="list-style-type: none"> <li>✓ Bad sore</li> <li>✓ Care Of The Terminally Ill,</li> <li>✓ Unconscious Patient</li> <li>✓ Post Mortem Care</li> <li>✓ Research findings regarding nursing art ---- 3</li> </ul>	<b>9 hrs./wk</b>
	<b>Skill lab -----4 hrs.</b> Bad sore determination skills Care of dead body	
<b>Week 16 -19</b>	Hospital practice	
<b>Week 20</b>	Final examination and OSCE	

### **Fundamental of nursing practicum (Week 16-19)**

**Module pre requisite- foundation I module, Biomedical Science I**

## Fundamental of nursing practicum II

- ❖ By the end of this module, the students will be able to do basic nursing care by applying knowledge, attitude and skills of fundamental nursing, first aid, biomedical sciences and pharmacology in the nursing practice.
- ❖ To meet the above module objective, the students are expected to:
  - ✧ Perform nasogastric tube insertion
  - ✧ Discuss nutrition and metabolism patterns of patients under nursing care
  - ✧ Demonstrate therapeutic and diagnostic procedure, and tests (Gastrointestinal system (GIS), genitourinary system (GIS), Reproductive system (RS), Integumentary system (IS), Endocrine system (ES) and Nervous system (NS))
  - ✧ Document information's according to principles of proper recording and documentation
  - ✧ Perform urinary catheter for patient with altered urinary function
  - ✧ Provide nursing care of patients with altered skin integrity
  - ✧ Explain the purpose of nursing process using Gordon approach procedure (Gastrointestinal system (GIS), genitourinary system (GIS), Reproductive system (RS), Integumentary system (IS), Endocrine system (ES) and Nervous system (NS))
  - ✧ Interpret the normal and the abnormal organized (liver function tests, renal function tests, blood glucose and DM tests, and urine sediments) with their diagnostic features.
  - ✧ Identify the different types of surgical instruments
  - ✧ Demonstrate receiving and positioning of surgical patients
  - ✧ Describe the roles of nurses in the pre, intra and postoperative phases of patient care.
  - ✧ Distinguish the difference between general and local anesthesia

S. N	Procedure
1	History taking and P/E
	Application of nursing process
2	Naso- Gastric Tube Insertion & removal
	In Adults , Pediatrics, Neonatal , Gastric gavage , Gastric Lavage Suctioning <b>Gastrostomy feeding</b> Death care Counseling client with grieving

	Paracentesis, Thoracentesis, biopsy, Lumbar puncture procedure Parenteral feeding Glucose monitoring , Urine test (dipstick) DKA management
3	Thermoregulation
4	Proving bath
5	General Body Care
	Oral, Dental, Hair care
6	Catheterizations
	Male / female catheterization /Inserting and removing
	Plain catheter

	Indweller
	Condom catheter
7	Bladder irrigation
	Open , Closed
8	Bowel Elimination
	Enema
9	Insertion of flatus tube
10	Colostomy irrigation and care
11	Positioning of patients
12	Surgical instruments & handling
	Cutting & Dissecting, Grasping & Holding, Clamping & Occluding, Exposing & Retracting, Suturing & Stapling
	Giving care for altered and unconscious client, Perform CPR
13	foreign body Removal
	From Eye, Nose, Ear
Assessment methods	<ul style="list-style-type: none"> <li>• Direct Observation of Procedural Skills (DOPS) --- 20%</li> <li>• Mini-clinical evaluation exercise (mini-CEX) -----20%</li> <li>• Clinical encounter cards (CEC)-----20%</li> <li>• Review of logbook -----10 %</li> <li>• OSCE/Oral exam----- 20%</li> <li>• Seminar presentation ----- 10%</li> </ul>
Working units	<ul style="list-style-type: none"> <li>• Different Emergency Units</li> <li>• OPD and Specialty Clinics</li> <li>• Wards and Procedure rooms</li> <li>• Follow-up Units</li> <li>• Others</li> </ul>



# HEALTH PROMOTION AND DISEASE PREVENTION

Module Title: Health Promotion and Disease Prevention

Module Code: SPHM-2052 Module

ECTS: 5

Duration = 16 weeks

Lecture hour = 56

**Community practice: 8hrs for two weeks**

**Module Description:** The module is designed to equip learners with the knowledge, skills and attitude needed to promote health and prevent disease in individuals, families and population. It also helps students develop an understanding of nutrition as an integral part of the overall health care system.

**Module competence:** after completion of this module the students will be able to

- Identify priority action areas for health promotion in Ethiopia
- Prepare, plan and schedule health education at community and health facility level
- Apply methods of nutritional assessment and interpret results communicate health related information at different level.

## **Module Objective**

At the end of this module, medical students will be able to apply principles and methods of health promotion and nutrition to improving the health of a population

### **Supporting Objectives**

- Describe the history and evolution of health promotion, including the relationships between health education, health promotion and public health
- Discuss the concepts and models of disease prevention and health promotion
- Illustrate the contribution of the social sciences to health promotion theory and practice
- Identify priority action areas for health promotion in Ethiopia
- Describe the epidemiology of emergency & critical illnesses globally and nationally
- Analyze health problems in their social context with focus on emergency and critical illness
- Apply methods of nutritional assessment and interpret results
- Describe evidence-based strategies to improve nutrition of individuals and population
- Describe national reproductive health and nutrition strategies
- Describe health promotion programs in Ethiopia

- Describe application of different health education related theories in designing and assessing behavior change
- Describe the planning of health education in the context of the Precede-Proceed Model
- Describe the concepts of empowerment, participation, social capital, and capacity building
- Identify barriers for the implementation of health education in individuals and population groups, based on theories of diffusion and social change
- Identify appropriate health promotion measures effective for health problems of public health significance in Ethiopia
- Demonstrate the ability to promote the health of populations by influencing lifestyle, nutrition and socio-economic, physical and cultural environment through methods of health promotion, including health education, directed towards populations, communities and individuals
- Demonstrate the ability to plan, implement and evaluate health promotion activities (K4)
- Demonstrate the ability to communicate effectively in writing and orally with linguistic and cultural proficiency
- Apply communication and group dynamic strategies in interactions with individuals and groups
- Demonstrate the ability to use effective communication for healthcare advocacy
- Demonstrate clear, sensitive and effective communication skills in interacting with individuals, families, PHCU staff, peers and faculty
- Advise individuals and families to promote health and prevent illness
- Demonstrate professional values and behavior in interaction with individuals, families and communities consistent with the future role of a physician
- Demonstrate key public health values, attitudes and behaviors such as commitment to equity and social justice, recognition of the importance of the health of the community as well as the individual, and respect for diversity, self-determination, empowerment, and community participation
- Show respect for peers and other healthcare professionals and the ability to foster a positive collaborative relationship with them
- Analyze community practice experience and perform practice-based improvement activities using a systematic methodology
- Demonstrate a habit of self-reflection, responsiveness to feedback and an on-going development of new skills, knowledge and attitude

- Search, collect, organize and interpret health and health-related information from different sources
- Use information and communication technology to assist in health promotion and disease prevention measures for individuals and families

### **Teaching-Learning Methods**

- ❖ Interactive lecture and discussion
- ❖ Small group learning activities: assignment, exercise, case study, role play
- ❖ Individual reading
- ❖ PHCU/Community-based learning and study trip: home visit, discussion with individuals and families to identify and solve problems, observation, health education, PHCU visit, Zonal and District Health Department Visit, field visit, and targeted literature review based on community experience
- ❖ Student presentation
- ❖ Personal research and reflection exercise (PRRE)
- ❖ Reflective portfolio
- ❖ Guided community practice
- ❖ Facilitated discussion after exposure of learning experience
- ❖ Independent study
- ❖ Small group work
- ❖ Seminar

### **Assessment Methods ▪**

#### Formative assessment

- Exercise and assignment
- Logbook and portfolio
- 360-degree evaluation
- Student presentation
- Global rating of community experience midway during the module

#### ▪ Summative **assessment**

- Attachment along with clinical practice (40 %)

### **Module Schedule**

<b>Week</b>	<b>Contents</b>	<b>Time</b>
<b>1</b>	<p>History, concepts, aims and principles of health promotion and health education</p> <ul style="list-style-type: none"> <li>• History and evolution of health promotion and health education</li> <li>• Concepts of health promotion and health education</li> <li>• Health education in PHC</li> <li>• Health education in Ethiopia</li> <li>• Basic principles of health education</li> <li>• Aims of health education</li> <li>• Contribution of social sciences to health promotion</li> </ul>	3 hrs./wk
<b>2-5</b>	<p>Application of health education theories and models in behavior change □ Human behavior and health</p> <ul style="list-style-type: none"> <li>• Health education theories and models</li> <li>• Health Belief Model</li> <li>• Social Learning Theory</li> <li>• Stages of Change</li> <li>• Diffusion of Innovation Theory</li> <li>• Theory of Planned Behavior</li> </ul>	3 hrs./wk
<b>6-8</b>	<p>Health communication</p> <ul style="list-style-type: none"> <li>• Concepts and principles of health communication</li> <li>• Communication model and process</li> <li>• Individual and group communication strategies</li> <li>• Effective communication skills</li> <li>• Barriers of communication</li> </ul>	3 hrs./wk
<b>9-10</b>	<p>Planning, implementing and evaluating health education</p> <ul style="list-style-type: none"> <li>• Methods and materials for health education</li> <li>• Adult learning theories</li> <li>• Peer education</li> <li>• Conducting health education</li> <li>• Evaluating health education</li> </ul> <p>Health education in different settings</p> <ul style="list-style-type: none"> <li>• Patient education</li> <li>• School health education</li> <li>• Prison health education</li> </ul>	4 hrs./wk

<b>11</b>	<p>Health promotion principles</p> <ul style="list-style-type: none"> <li>• Health perspectives and choice of strategies to address health issues</li> <li>• Models and theories of health promotion (PRECEDE-PROCEED Model)</li> <li>• Principles of advocacy</li> <li>• Principles of social marketing</li> <li>• Principles of social/community mobilization</li> <li>• Community diagnosis</li> </ul>	4 hrs./wk
<b>12-16</b>	<p>Nutrition and health</p> <ul style="list-style-type: none"> <li>• Introduction to human nutrition</li> <li>• Nutritional requirements at different stages of the life cycle</li> <li>• Common food sources of nutrients and food taboos in Ethiopia</li> <li>• Assessment of nutritional status</li> <li>• Meal planning for a patient</li> <li>• Epidemiology and consequences of malnutrition in Ethiopia</li> <li>• Macronutrient deficiencies of public health importance in Ethiopia</li> <li>• Micronutrient deficiencies of public health importance in Ethiopia</li> <li>• Public health interventions to address malnutrition (Nutrition sensitive and specific intervention)</li> <li>• Food and nutrition policies and programs in Ethiopia</li> </ul>	4 hrs./wk
Week 17	<i>Exam week</i>	
Week 18-19	<p><b>Community practice along with Clinical practice</b></p> <p>Main Objective/activities</p> <p>Promotion of community health</p>	8 hrs./wk for 2weeks
	<p>Prevention of disease</p> <p>Practice Nutritional assessment</p> <p>N.B. students are required to identify measure health problems (their determents) , measure health and disease in the community , design strategy to implement health promotion and disease prevention</p>	
	<b>Assessment</b>	
	- Written exam	60%
	- Direct observation of individual/group performance	10%
	- Review of Reflective portfolio (review of works/activities/tasks /projects/assignments etc...completed by students.	10%
	- Report from the project	15%
	- Other (seminar )	5%

## References

1. Carl Fertman and Diane Allensworth. Health promotion programs: from theory to practice. 2010
2. Lawrence Green, Marshall Kreuter. Health program planning: an educational and ecological approach. Volumes 1-2. 2005
3. Jackie Green, Keith Tones. Health promotion: planning and strategies. 2010.
4. Mark Edberg. Essentials of health behavior: social and behavioral theory in public health. 2007
5. Richard D. Semba and Martin W. Bloem. Nutrition and health in developing countries. Human Press. 2008
6. Goeffrey P Webb. Nutrition. A health promotion approach. 3rd edition.
7. Michael J. Gibney , Prof. Susan A. Lanham , Aedin Cassidy , Hester H. Vorster.
8. Introduction to human nutrition. 2nd edition. 2009
9. Denis M Medeiros, Robert E.C. Wildman. Advanced human nutrition. 2nd edition. 2011  
Judith E. Brown. Nutrition through the life cycle. 4th edition. 2010.
10. Rosalind S. Gibson. Principles of nutritional assessment.
11. Michael Gibney, HESTER H VORSTER. Clinical nutrition. 2005
12. Berhane Y, Haile Mariam D, Kloos H. The epidemiology and ecology of health and disease in Ethiopia. Addis Ababa; Shama Books, 2006.
13. FMOH. National reproductive health strategy
14. FMOH. National nutrition strategy
15. Salem, R.M., Bernstein, J., Sullivan, T.M., and Lande, R. "Communication for Better Health," Population Reports, Series J, No. 56. Baltimore, INFO Project, Johns Hopkins Bloomberg School of Public Health, January 2008. Available online: <http://www.populationreports.org/j56/>

# MEASUREMENT OF HEALTH & DISEASE

**Module Title: Measurement of Health & Disease**

**Module Code: SPH-2012**

**Module ECTS: 7**

**Module Crhr. 4**

**Lecture Hours: 68 hours**

**Community: 8 hr./week for 2 week**

**Module Duration: 20weeks**

**Module Description:** This module is designed to equip nursing students with the basic concepts of epidemiology, measures of disease occurrence, establishment of disease causation, epidemiological study designs, outbreak investigation and management, screening in disease control and epidemiological surveillance and introduce students the basic statistical knowledge on data collection and presentation methods, Measures of Central Tendency and Variation, probability and probability distributions, one sample inference, regression and correlation.

**Module competence:** after completion of this module the students will be able to

- Apply epidemiological approaches in identifying and managing community health problems
- Identify early signs of outbreak and implement appropriate prevention mechanism
- Search, collect, organize and interpret health and health-related data from different sources

## **Module Objective**

At the end of this module, learners will be able to apply public health methods for the measurement of health and disease at population level.

## **Supporting Objectives**

- Apply epidemiological approach to disease causation with emphasis on infectious diseases
- Apply levels of prevention regarding avoidance and control at different levels
- Apply the different types of epidemiologic studies
- Calculate and interpret measures of morbidity and mortality including from existing data sources

- Apply different methods of data collection in the community
- Apply basic biostatistics concepts, tools and methods
- Describe criteria for establishing and evaluating screening programs and factors that affect validity and reliability of screening tests
- Describe the processes, uses, and evaluation of public health surveillance
- Apply the steps of an outbreak investigation and management
- Discuss epidemiology of diseases of public health significance in Ethiopia and locally
- Demonstrate clear, sensitive and effective communication skills in interactions with individuals, families, communities, PHCU staff, local health department staff, peers and faculty
- Suggest health promotion and disease prevention methods for major public health problems
- Analyze community practice experience and perform practice-based improvement activities using a systematic methodology
- Search, collect, organize and interpret health and health-related information from different sources
- Use information and communication technology to assist in health promotion and disease prevention measures for individuals and families

### **Teaching-Learning Methods**

- Interactive lecture and discussion
- Small group learning activities: assignment, exercise, case study
- Individual reading
- PHCU/Community-based learning and study trip: home visit, discussion with individuals and families to identify and solve problems, observation, PHCU visit, Zonal and District Health Department Visit, field visit, and targeted literature review based on community experience
- Use of computer applications and access to the internet
- Student presentation
- Personal research and reflection exercise (PRRE)
- Reflective portfolio and mentoring Teaching aids
- LCD and computer or Overhead projector and transparencies, writing board and marker or chalk)
- Computers with appropriate statistical software like EPI info and SPSS
- Handouts of lecture materials
- Logbooks for entry of community experience



### Assessment Methods Formative assessment

- Exercise and assignment
- Logbook and portfolio
- 360-degree evaluation
- Student presentation
- Global rating of community experience midway during the module
- Guided community practice
- Facilitated discussion after exposure of learning experience
- Independent study
- Small group work
- Seminar

### Assessment

- Written exam (60 %)
- Community attachment (40 %) along with clinical practice:
  - Review of Reflective portfolio (review of works/activities/tasks /projects/assignments etc...completed by students. (10%)
  - Direct observation of performance (individual/group) = 10%,
  - Report from the project (15%)
  - Other performance (seminar etc.) = 5%

### Module Schedule

Week	Contents	Time
1	Introduction to public health Health and disease: concepts, definitions and perspectives Public health: definition, philosophy, history, development, core functions and services Public health sciences, their scope and use in medicine	4 hrs./wk

<b>2-5</b>	Epidemiological concepts of disease causation Introduction to epidemiology Concepts of disease causation Epidemiological models in disease causation Factors in causation Time, Place and Person concept in disease causation Establishing causation Natural history of diseases (communicable and non- communicable) Levels of prevention The infectious disease cycles Screening Definition of screening Types and Criteria of screening Factors affecting validity and reliability of screening tests	4 hrs./wk
<b>6-9</b>	Types of epidemiologic studies, their use and limitations Descriptive study designs Analytical epidemiology Observational Vs Experimental Basic measurement in epidemiology Rates, ratios and proportions Measures of morbidity (incidence, prevalence)	6 hrs./wk
	Measures of mortality (Crude vs. specific rates, Standardization of rates) Source of epidemiologic data Epidemiology of diseases of public health significance in Ethiopia	
<b>10-15</b>	Introduction to biostatistics Types of variables/Scales of Measurement Method of data organization and presenting (tabular ad graphic methods) Method of data summarizing Probability and probability distributions Sampling distributions Statistical inferences Point and interval estimation Hypothesis testing Measures of Association Sample size determination Interpreting and communicating results	4 hrs./wk

<b>16</b>	Public health surveillance Principles of public health surveillance Integrated disease surveillance and response Timely warning and intervention Mapping, zooning and censusing	4 hrs./wk
<b>17</b>	Outbreak investigation and management Patterns of occurrence of diseases Disease outbreaks Steps of investigation of an outbreak Management and control of an outbreak or epidemic	4 hrs./wk
<b>18</b>	Exam period	
19-20	<b>Community practice along with Clinical practice</b> Main Objective To measure health and disease at individual, family and community level Identify and interpret data Design strategies to promote health and prevent disease	8 hrs./wk for 1 week

## Reference

1. Fletcher. Principles of Epidemiology
2. Charles H Hennekens and Julie E Buring. Epidemiology in Medicine
3. Rothman, Kenneth J.; Greenland, Sander; Lash, Timothy L. Modern epidemiology. 3<sup>rd</sup> edition.
4. David G. Kleinbaum, Kevin M. Sullivan. A pocket guide to epidemiology. 2007
5. Yemane Berhane, Damen Hailemariam and Helmut Kloos. Epidemiology and ecology of health and disease in Ethiopia. 2006
6. Daniel. Biostatistics: a foundation for analysis in health sciences.
7. Pagano. Principles of Biostatistics
8. Colton. Statistics in Medicine

## MODULE NAME: MEDICAL SURGICAL NURSING-I

Module Name: Medical Surgical Nursing-I

Module Code: NursM-2073

Module ECTS: 18

Credit hours: 11

Prerequisite: Foundation I and II

### Module summary

	Weeks	Total hours
Total module duration	20	686
<input type="checkbox"/> Class room based teaching (lecture)	11	220
<input type="checkbox"/> SDL (clinical and biomedical lab) teaching		27
<input type="checkbox"/> PBL		34
<input type="checkbox"/> Clinical practice	8	400hrs (40hrs./wk)
<input type="checkbox"/> Exam period	1	
<b>Course Contents contributed to the module</b>	<b>Total hours</b>	<b>Emphasis %</b>
Nursing Health Assessment	<b>27</b>	4%
Communicable disease control	<b>34</b>	5%
Medical-Surgical Nursing theory	<b>164</b>	24%
Skill lab	<b>27</b>	4%
PBL	<b>34</b>	5%
Medical Surgical Nursing I Clinical Practicum	<b>398</b>	58%
<b>Total</b>	<b>684</b>	<b>100%</b>

**Module Description:** This module is designed for Compressive BSc Nursing students to give adequate opportunity to learn basic principles of management of biopsychosocial, eye, ear, nose, and throat, respiratory, gastrointestinal, Musculoskeletal, immunology, gerontology and oncologic disorders. It enables students to assess, diagnose, plan, implement, monitor and evaluates the outcomes of nursing intervention for patients having medical and/or surgical disorders.

## Module Competencies

- Assess, diagnose, plan and manage patients with bio-psychosocial, EENT, respiratory, gastrointestinal, MSS, immunology, gerontology and oncologic disorders, and evaluate outcomes using the nursing process as a framework
  - Manage common emergencies and acute health problems
  - Provide management and follow-up for chronic health problems
  - Apply critical thinking, professionalism and problem-solving skill
  - Use a critical inquiry process to support clinical judgment and clinical reasoning in nursing practice
  - Make clinical decision in accordance to professional standards and scope of practice
  - Recognize critical thinking and problem solving skills to provide health care services
- Module Objective:** By the end of this module, students will be able to provide high-quality and standardized nursing care for patients with bio-psychosocial, EENT, respiratory, gastrointestinal, MSS, immunology, gerontology and oncologic disorders. **Supporting Objectives**

To achieve the above module objectives, the students will be expected to:

- Discuss the basics of nursing health assessment
- Conduct nursing health assessment using both functional health patterns and medical approach
- Performs a focused health assessment and/or an advanced comprehensive health assessment, using and adapting assessment tools and techniques based on client needs and relevance to client stage of life.
- Diagnoses diseases, disorders, injuries, and conditions and identifies health needs, while considering the client response to the health/illness experience;
- Supports, educates, coaches and counsel clients regarding diagnoses, prognoses, and self-management including their personal responses to diseases, disorders, conditions, injuries, risk factors, lifestyle changes and therapeutic interventions;
- Identify, diagnose, treat and apply preventive measures for common communicable diseases
- Provide nursing care for older adults as per their need by taking nursing process as framework.
- Examine the concerns of older people and their families in the home and community, in the acute care setting, and in the long-term care facility.
- Use the nursing process as a framework for the care of patients with pain

- Discuss the basics of pathophysiology like cell adaptation, injury, inflammation, healing and cell death
- Incorporate the knowledge of pathophysiology in making diagnosing and providing over all therapeutic managements for patient with EENT, GIS, RS, Immunology and MSS disorders.
- Provide nursing care for patient with cancer during surgery, radiation therapy, chemotherapy, targeted therapy, hematopoietic stem cell transplantation, and other therapies
- Provide effective palliative care for patient with cancer and other chronic illness related to EENT, GIS, RS, and Immunology and MSS.
- Practice comprehensive care co-ordination and interdisciplinary team work across all setting where palliative care is offered
- Provide nursing care for a patient with cancer using nursing process as framework
- Perform effectively common nursing procedure identified in EENT, GIS, RS, and MSS.
- Properly involve and take a role in the performance of diagnostic and therapeutic procedure involving EENT, GIS, RS, and MSS.
- Use the nursing process as a framework for care of patients with EENT, GIS, RS, Immunology and MSS disorders.
- Provide appropriate teaching for the patient and family affected by EENT, GIS, RS, Immunology and MSS disorders.
- Provide safe and effective nursing care for patients having surgery involving, EENT , GIS, RS, and MSS.
- Manage patients with communicable diseases

#### Teaching and learning methods

1. Interactive lecture
2. Small group discussion
3. Roleplay
4. Case study
5. Video show
6. Demonstration
7. Facilitated practice with feedback **Methods of assessment Formative**

#### assessment

1. Quiz
2. Assignment

3. Seminar
4. Project work
5. Observation with a checklist
6. Logbook
7. Dairy writing
8. Nursing care plan
9. Feedback on reflective portfolio

### **Summative assessment of the overall module**

Class room-based teaching=40%

Written test=25%

PBL=5%

SDL =10%

Total = 40%

Clinical practice = 60%

Workplace based assessments) ----30% select applicable one

- Mini-Clinical Evaluation Exercise (mini-CEX)
- Clinical Encounter Cards (CEC)
- Clinical Work Sampling (CWS)
- Blinded Patient Encounters (BPE)
- Case-based Discussion (CbD)
- MultiSource Feedback (MSF)
- Direct Observation of Procedural Skills (DOPS)

Review of portfolio=12%

OSCE with oral =12%

Other student performance (seminar, CBD etc.) 6%

Total =60%

Lecture and discussion = 20hr/week for 6weeks

PBL=4hr/weeks for 6weeks

SDL= 2hr/week for 6weeks

Self-study

Week 13= examination weeks

Clinical practice = 5 weeks (from week 14-18) = 40hr/week

## Module schedule

<b>Medical surgical nursing-I</b>		
<b>Week</b>	<b>Learning activity</b>	<b>Hours</b>
<b>Week 1</b>	<p><b>Introduction to Medical Surgical nursing) (5 hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Definition</li> <li>✓ Scope of medical surgical nursing</li> <li>✓ Concepts of health, wellness and illness</li> <li>✓ Health Illness Continuum Model</li> <li>✓ Healthcare delivery system</li> <li>✓ Community based nursing practice</li> </ul> <p>Introduction to Nursing Health Assessment(2hrs)</p> <p>Approaches for Nursing Health Assessment (Gordon's and Medical) (4hrs)</p> <p>Introduction to nursing process(Six steps) (4 hrs)</p> <ul style="list-style-type: none"> <li>✓ Types of assessment and data</li> <li>✓ Taking health history</li> <li>✓ Principle and techniques</li> <li>✓ Physical examination</li> </ul>	15 hrs./wk
<b>Week 2</b>	<p>Introduction to communicable Disease control (10 hrs)</p> <p>Classification of Communicable Diseases</p> <ul style="list-style-type: none"> <li>✓ Definitions of terms</li> <li>✓ Epidemiology and scope of communicable diseases</li> <li>✓ Definition, types, description of the transmission of communicable diseases</li> <li>✓ Chain of disease transmission</li> <li>✓ Factors involved in the chain of disease transmission</li> <li>✓ Carrier&amp; its type</li> <li>✓ Natural history of disease</li> <li>✓ Time course of infectious diseases</li> <li>✓ Levels of prevention</li> <li>✓ Principles of communicable disease control</li> </ul>	17 hrs./wk
	<p><b>Skill (3 hrs)</b></p> <p>History taking (medical and Gordon's approach)</p> <p>Physical examination techniques</p>	



	<b>PBL (4 hours):</b>	
<b>Week 3</b>	<ul style="list-style-type: none"> <li>• <b>Introduction to oncology nursing(8hr)</b> <ul style="list-style-type: none"> <li>✓ Definition</li> <li>✓ Risk factor/causes</li> <li>✓ Biology of cancer cells</li> <li>✓ Pathophysiology of cancer cells</li> <li>✓ Types of malignancy</li> <li>✓ Nomenclature and features neoplasm</li> <li>✓ Common types of cancer (Breast, Lung, Prostate...)</li> <li>✓ Cancer Detection and diagnostic modalities (2hrs)</li> <li>✓ Treatment modalities and nursing role (4hrs)</li> </ul> </li> <li>• Chemotherapy □ Surgery</li> <li>• Radiation</li> <li>• <b>Concepts of Palliative care (2hrs)</b> <ul style="list-style-type: none"> <li>✓ Principles of palliative care</li> <li>✓ Components of palliative care</li> </ul> </li> <li>□ <b>Application of Nursing process for a patient with cancer (2 hrs)</b></li> </ul>	24 hrs./wk
	<ul style="list-style-type: none"> <li>• <b>Skill lab(2hr):</b></li> <li>• <b>Pain assessment</b> skills with algorism</li> </ul>	
	□ <b>PBL (4hr):</b>	
<b>Week 4</b>	<p><b>Bio-psychosocial concepts related to health (4hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Adult development</li> <li>✓ Stress, coping and adaptations</li> <li>✓ Pain and pain management options (2hrs)</li> <li>✓ Loss, death and dying</li> <li>✓ Trans-cultural nursing</li> <li>✓ Rehabilitation practice</li> <li>✓ Application sensory and perceptual pattern (1 hr.)</li> <li>✓ Application stress and coping pattern (1 hr.) <b>Immunology</b> ..... (6hrs)</li> <li>✓ Assessment of immune function</li> <li>✓ Anatomic and physiologic overview of immune system</li> <li>✓ History &amp; Physical examination</li> <li>✓ Diagnostic evaluation of Immunologic disorders</li> <li>✓ Immunopathology</li> <li>Hypersensitivity reactions</li> </ul>	20 hrs
	✓ <b>Skill Lab= 2hrs</b>	
	<b>PBL= 4hrs</b>	



<b>Week 5</b>	<p><b>Nursing and Medical management of patient with HIV (4hrs) Nursing</b></p> <p><b>managements of Patients with eye disorders</b></p> <p>Anatomy and physiologic review of the eye Assessment of patient with eye (2 hrs)</p> <ul style="list-style-type: none"> <li>✓ Definition</li> <li>✓ Risk factor/causes</li> <li>✓ Classification</li> <li>✓ Epidemiology</li> <li>✓ Pathophysiology</li> <li>✓ Clinical Manifestation</li> <li>✓ Diagnosistic modalities</li> </ul> <p><b>Assessment of sensory and perceptual pattern (eye) (2hrs)</b></p> <ul style="list-style-type: none"> <li>✓ History taking</li> <li>✓ P/E (Visual acuity, visual field) <b>Refractive errors (2hr):</b></li> <li>✓ Myopia</li> <li>✓ Hypermetropia</li> <li>✓ Astigmatism</li> <li>✓ Presbyopia</li> </ul> <p><b>Disease of the eyelids... (2 hours)</b></p> <ul style="list-style-type: none"> <li>✓ Hordeolum (stye)</li> <li>✓ Chalazion</li> <li>✓ Trichiasis</li> <li>✓ Ectropion</li> <li>✓ Ptosis</li> <li>✓ Blephritis</li> </ul> <p><b>Disease of the lacrimal gland ..... (1 hr.)</b></p> <ul style="list-style-type: none"> <li>✓ Dacryocystitis</li> </ul> <p><b>Disease of the conjunctiva... (1 hr.)</b></p> <ul style="list-style-type: none"> <li>✓ Conjunctivitis (bacterial,viral,allergic)</li> <li>✓ Trachoma</li> <li>✓</li> </ul>	20 hrs./wk
	<b>Skill Lab= 2hrs</b>	
	<b>PBL= 4hrs</b>	

<p><b>Week 6</b></p>	<p><b>Disease of the cornea... (2 hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Keratitis</li> <li>✓ Pterygium</li> <li>✓ Corneal abrasion or ulcer</li> </ul> <p><b>Disease of the lens-cataract (4 hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Glaucoma</li> <li>✓ Muscular eye disorders</li> <li>✓ Nystagmus</li> <li>✓ Strabismus</li> </ul> <p><b>Nursing Mgt of Patients with ear, nose and throat disorders (2 hours)</b></p> <p><input type="checkbox"/>Introduction to ENT</p> <p><input type="checkbox"/>Nursing Health Assessment</p> <p>Overview of anatomy and physiologic review of ENT Assessment of patient with ENT (4 hrs.)</p> <ul style="list-style-type: none"> <li>• Visual acuity</li> <li>• Visual Field</li> <li>• Ophthalmic Examinations</li> <li>• Fundoscopic Examinations</li> <li>• History</li> <li>• Physical examination</li> <li>• Diagnostic evaluation</li> </ul> <p><b>Disorder of the ear/ hearing disorders (2hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Definition</li> <li>✓ Risk factor/causes</li> <li>✓ Pathophysiology</li> <li>✓ Clinical Manifestation</li> <li>✓ Diagnostic Modalities</li> </ul>	<p>22 hrs./wk</p>
	<p><b>Skill:(2hrs) ✓ Differential Diagnosis</b></p>	
	<p><b>PBL: 4 hrs</b></p>	
<p><b>Week 7</b></p>	<p><b>External ear problems (2 hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Cerumenimpaction</li> <li>✓ Foreign bodies</li> <li>✓ External otitis</li> </ul> <p><b>Middle Ear Problems (2 hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Otitis Media</li> <li>✓ Mastoiditis</li> <li>✓ Otosclerosis</li> </ul>	<p>22 hrs./wk</p>

	<p><b>Disorders of the nose and nasal cavity (2hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Nasal obstruction</li> <li>✓ Deviated nasal septum</li> <li>✓ Epistaxis</li> <li>✓ Nasal polyps</li> </ul> <p>Infections (Rhinitis ,Sinusitis)</p> <p><b>Nursing Care of Patients with Respiratory system Disorders (4hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Introduction to the respiratory system</li> <li>✓ Review of anatomy and physiology of respiratory system</li> <li>✓ Assessment of patient with respiratory system History</li> <li>✓ Physical examination</li> </ul> <p>Diagnostic and therapeutic procedures Activity and exercise pattern(respiratory)</p> <ul style="list-style-type: none"> <li>• <b>Introduction to upper respiratory disorders(3hr)</b> <ul style="list-style-type: none"> <li>✓ Definition</li> <li>✓ Risk factor/causes</li> <li>✓ Pathophysiology</li> <li>✓ Clinical Manifestation</li> <li>✓ Diagnostic Modalities</li> <li>✓ Differential Diagnosis</li> <li>✓ Management options</li> <li>✓ Complications</li> </ul> </li> <li>• <b>Common problems of upper respiratory disorders (3 hrs)</b> ✓ Tonsillitis <ul style="list-style-type: none"> <li>✓ Pharyngitis ✓ Laryngitis</li> <li>✓ Adenoiditis</li> <li>✓ Common cold</li> </ul> </li> <li>• Application of nursing process for patient with upper respiratory disorder/s</li> </ul> <p><b>Skill lab(2hr)</b></p> <ul style="list-style-type: none"> <li>✓ Chest drainage system</li> <li>✓ Chest percussion &amp;vibration</li> <li>✓ Steam Inhalation</li> <li>✓ Activity and exercise pattern(respiratory)</li> <li>✓ Management of asthma with available guidelines</li> <li>✓ Nursing care plan for patient with bronchial asthma <b>PBL 4hr:</b></li> </ul>	
<b>Week 8</b>	<p><b>Air Borne Disease(CDC) (2hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Definition</li> <li>✓ Agent</li> </ul>	<b>22 hrs./wk</b>

- ✓ Incubation period
- ✓ Period of communicability
- ✓ Epidemiology
- ✓ Risk factor/causes
- ✓ Life cycle
- ✓ C/m
- ✓ Diagnosis
- ✓ Differential Diagnosis
- ✓ Management
- ✓ Complications
- ✓ Prevention and control methods

**Common air borne diseases (4 hrs)**

- ✓ Leprosy (Hansen's disease)
- ✓ Influenza
- ✓ Tuberculosis

**Lower Respiratory Tract Disorders (2hrs)**

- ✓ Definition
- ✓ Agent
- ✓ Incubation period
- ✓ Period of communicability
- ✓ Epidemiology
- ✓ Risk factor/causes
- ✓ Life cycle
- ✓ C/m
- ✓ Diagnosis
- ✓ Differential Diagnosis
- ✓ Management
- ✓ Complications
- ✓ Prevention and control methods

**Common problems of Lower respiratory tract (6 hrs)**

- ✓ Bronchitis
- ✓ Pneumonia
- ✓ COPD
- ✓ Chronic Bronchitis Bronchiectasis
- ✓ Emphysema
- ✓ Asthma
- ✓ Lung abscess
- ✓ Empyema
- ✓ Pneumothorax
- ✓ Lung injury
- ✓ Pleural effusion Atelectasis

	<ul style="list-style-type: none"> <li>✓ Corpulmonale</li> <li>✓ Pulmonary embolism Pulmonary edema Pleurisy/Pleuritis</li> <li>✓ ARDS (Acute Respiratory Distress Syndrome)</li> <li>✓ COVID-19</li> </ul> <p>Application of nursing process for a patient with TB</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Introduction to gastro intestinal system</b></li> <li><input type="checkbox"/> Overview of anatomy ,physiology</li> <li><input type="checkbox"/> Assessment of gastrointestinal system (<b>4hrs</b>) <ul style="list-style-type: none"> <li>Hx</li> <li>Abdominal Assessment</li> <li>Common diagnostic procedure</li> <li>Therapeutic procedures</li> </ul> </li> <li>✓ Definition</li> <li>✓ Risk factor/causes</li> <li>✓ Pathophysiology</li> <li>✓ Clinical Manifestation</li> <li>✓ Diagnostic Modalities</li> <li>✓ Differential Diagnosis</li> <li>✓ Management options</li> <li>✓ Complications</li> </ul>	
	<b>Skill Lab=2hrs</b>	
	<b>PBL= 4hrs</b>	
<b>Week 9</b>	<p><b>Diseases of the mouth and related structures (4 hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Periodontal diseases Periapical abscesses</li> <li>✓ Dental caries and tooth extraction Stomatitis</li> <li>✓ Gingivitis</li> <li>✓ Parotitis</li> <li>✓ Trauma of the mouth and jaw</li> <li>✓ Fracture of the jaw</li> <li>✓ Injury to soft tissues</li> </ul> <p><b>Esophageal Disease (1hr.)</b></p> <ul style="list-style-type: none"> <li>✓ Achalasia</li> <li>✓ GERD</li> </ul> <p><b>Elimination pattern (Bowel) (2 hrs)</b></p>	<b>24 hrs./wk</b>

	<p><b>Gastric disorders (3hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Gastritis</li> <li>✓ PUD</li> <li>✓ Pyloricstenosis</li> <li>✓ Constipation Diarrhea</li> <li>✓ Application of nursing process for a patient with PUD</li> </ul> <p><b>Intestinal parasitic disease and infection (8hrs.)</b></p> <ul style="list-style-type: none"> <li>✓ Feco-oral transmitted disease</li> <li>✓ Typhoid fever</li> <li>✓ Amoebiasis</li> <li>✓ Giardiasis</li> <li>✓ Ascariasis</li> <li>✓ Trichuriasis</li> <li>✓ Entrobiasis</li> <li>✓ Strogloidiasis</li> <li>✓ Hookworm</li> <li>✓ Teaniasis</li> <li>✓ H. Nana</li> <li>✓ Shigellosis</li> <li>✓ Cholera</li> <li>✓ Acute Gastroenteritis (AGI)</li> <li>✓ Guinea worm, Schistosomiasis</li> <li>✓ Onchocerciasis</li> <li>✓ Management of patient with cholera</li> </ul>	
	<b>Skill Lab=2 hrs.</b>	
	<b>PBL=4hrs</b>	
<b>Week 10</b>	<p><b>Degenerative Joint Disorders (4 hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Osteoarthritis</li> <li>✓ Rheumatoid arthritis</li> <li>✓ Septic arthritis</li> </ul>	<b>20 hrs./wk</b>



	<ul style="list-style-type: none"> <li>✓ Gouty arthritis</li> <li>✓ Osteomyelitis</li> </ul> <p><b>Degenerative bone disease (2hr)</b></p> <ul style="list-style-type: none"> <li>✓ Osteoporosis</li> <li>✓ Osteomalacia</li> </ul> <p><b>Emergency and Critical Care cases (8 hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Intra-Abdominal Injuries</li> <li>✓ Crush Injuries</li> <li>✓ Frostbite</li> <li>✓ Hypothermia</li> <li>✓ Acute Alcohol Intoxication</li> <li>✓ Splint application</li> <li>✓ Bandaging</li> <li>✓ Cast application and care</li> <li>✓ Skin traction application and Traction care</li> </ul>	
	<b>Skill Lab=2hrs</b>	
	<b>PBL= 4hrs</b>	
<b>Week 1119</b>	<b>Hospital practice</b>	
	<b>Medical ward</b>	<b>Surgical ward</b>
	<ul style="list-style-type: none"> <li>• Developing nursing care plan for patient with medical disorder of EENT, GIS, RS, and MSS</li> <li>• Assess , diagnose and intervene patients with Medical disorders of EENT, GIS, RS, and MSS</li> <li>• Providing nursing care for a patient with EENT, GIS, RS, and MSS</li> <li>• Provide basic nursing care <ul style="list-style-type: none"> <li>☐ Monitoring of patient's condition and intervene</li> </ul> </li> <li>• Prevent and treat complications</li> <li>• NG tube insertion</li> </ul>	<ul style="list-style-type: none"> <li>☐ Assess , diagnose and intervene patients with surgical disorders</li> <li>☐ Providing nursing care for a patient with surgical problem of body systems</li> <li>☐ Providing nursing care for a patient with surgical problem of body systems</li> <li>☐ Practice scrubbing and circulating roles</li> <li>☐ Process surgical instruments</li> <li>☐ Apply principles of infection prevention</li> <li>☐ Assess and provide Wound care</li> <li>☐ Monitoring of patient's</li> </ul>

	<ul style="list-style-type: none"> <li><input type="checkbox"/> Input &amp; output monitoring</li> <li><input type="checkbox"/> Documentation &amp; recording</li> <li><input type="checkbox"/> Apply principles of infection prevention</li> <li><input type="checkbox"/> Interpreting investigations of lab result</li> <li><input type="checkbox"/> Implementing developed careplan</li> <li><input type="checkbox"/> Evaluating care plan</li> <li><input type="checkbox"/> Prepare bedside &amp; case presentations</li> <li><input type="checkbox"/> Rounds &amp; regular visits</li> <li><input type="checkbox"/> Administer oxygen for minimum of patients</li> <li><input type="checkbox"/> Perform postural drainage</li> <li><input type="checkbox"/> Chest percussion</li> <li><input type="checkbox"/> Chest vibration</li> <li><input type="checkbox"/> Perform airway suction</li> <li><input type="checkbox"/> Perform tracheotomy care</li> <li><input type="checkbox"/> Administering Oxygen</li> <li><input type="checkbox"/> Breathing and coughing exercise</li> <li><input type="checkbox"/> Perform gastric lavage</li> <li><input type="checkbox"/> Perform nasal tube feeding (gavage)</li> <li><input type="checkbox"/> Urinary Catheterization</li> <li><input type="checkbox"/> Perform intramuscular injection</li> <li><input type="checkbox"/> Perform subcutaneous injection</li> <li><input type="checkbox"/> Perform intravenous injection</li> <li><input type="checkbox"/> Set and give IV infusion</li> <li><input type="checkbox"/> Transfuse blood product</li> <li><input type="checkbox"/> Perform skin traction</li> <li><input type="checkbox"/> Provide eye irrigation, eye padding and dressing</li> <li><input type="checkbox"/> Administer medication via various routs</li> <li><input type="checkbox"/> Provide ear irrigation</li> <li><input type="checkbox"/> Assist in:- <ul style="list-style-type: none"> <li>✓ Abdominal paracentesis</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>condition and intervene</li> <li><input type="checkbox"/> Prevent and treat complications</li> <li><input type="checkbox"/> NG tube insertion</li> <li><input type="checkbox"/> Input &amp; output monitoring</li> <li><input type="checkbox"/> Documentation &amp; recording <ul style="list-style-type: none"> <li><input type="checkbox"/> Interpreting investigations of lab result</li> </ul> </li> <li><input type="checkbox"/> Developing and implementing nursing care plan</li> <li><input type="checkbox"/> Prepare bedside &amp; case presentations</li> <li><input type="checkbox"/> Rounds &amp; regular visits</li> <li><input type="checkbox"/> Provide Basic nursing care</li> <li><input type="checkbox"/> Administer oxygen for minimum of patients</li> <li><input type="checkbox"/> Perform peri-operative nursing care</li> <li><input type="checkbox"/> Pack and sterilize instruments, gloves and rums</li> <li><input type="checkbox"/> Suturing wound</li> <li><input type="checkbox"/> Remove wound stitches</li> <li><input type="checkbox"/> Perform tracheotomy care</li> <li><input type="checkbox"/> Administering Oxygen</li> <li><input type="checkbox"/> Breathing and coughing exercise</li> <li><input type="checkbox"/> Perform gastric lavage</li> <li><input type="checkbox"/> Perform nasal feeding(gavage)</li> <li><input type="checkbox"/> Urinary Catheterization</li> <li><input type="checkbox"/> Administer medication via various routs</li> <li><input type="checkbox"/> Set and give IV infusion</li> <li><input type="checkbox"/> Blood transfusion</li> <li><input type="checkbox"/> Assist in:- <ul style="list-style-type: none"> <li>✓ Abdominal paracentesis</li> <li>✓ Liver biopsy</li> <li>✓ Lumbar puncture</li> <li>✓ Traction applications</li> <li>✓ Cast care procedure</li> <li>✓ Bronchoscopy procedure</li> <li>✓ Colposcopy procedure</li> <li>✓ Endoscopy</li> </ul> </li> <li><input type="checkbox"/> Colostomy care</li> </ul>	
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	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Treat and care for patient with Feco- oral disease <input type="checkbox"/> Provide care for patient with immobilization devices	
	<input checked="" type="checkbox"/> Liver biopsy <input checked="" type="checkbox"/> Lumbar puncture <input checked="" type="checkbox"/> Bronchoscopy procedure <input checked="" type="checkbox"/> Colposcopy procedure <input checked="" type="checkbox"/> Endoscopy procedure <input type="checkbox"/> Treat and care for patient with feco-oral disease	<input type="checkbox"/> Crutch walking counseling	
<b>Teaching –learning methods and activities</b> <input checked="" type="checkbox"/> Guided practice(coaching) <input checked="" type="checkbox"/> Seminar presentation <input checked="" type="checkbox"/> Assignment/project/report <input checked="" type="checkbox"/> Group discussion following <input checked="" type="checkbox"/> Independent study and practice			
<b>Teaching –learning assessment methods</b> <input checked="" type="checkbox"/> Workplace based assessments) ----30% <i>Mini-Clinical Evaluation Exercise (mini-CEX)</i> <i>Clinical Encounter Cards (CEC)</i> <i>Clinical Work Sampling (CWS)</i> <i>Blinded Patient Encounters (BPE)</i> <i>Case-based Discussion (CbD)</i> <i>MultiSource Feedback (MSF)</i> <i>Direct Observation of Procedural Skills (DOPS)</i> <input checked="" type="checkbox"/> Review of portfolio ===12% <input checked="" type="checkbox"/> OSCE and oral exam—12% <input checked="" type="checkbox"/> Seminar presentation ==6%		<b>Total Weight (60%)</b>  Choose the convenient one from the listed workplace based assessment methods	
<b>Week 19</b>		<b>Exam week</b>	

## COMMUNITY-BASED TRAINING PROGRAM / CBTP/

**Module Title:** Community-Based Training Program

**Module Code:** SPHM-2082

**Module Duration:** 4 Weeks

**Module ECTs - 3**

**Module Description:** This CBTP attachment is intended to enable comprehensive nurse students to apply the knowledge, skills and attitude they have acquired during the academic year regarding disease prevention and control at community level.

**Module competence:** After the completion of this course the learner will have the following competence

- Identify and prioritize major health problem of a given community
- Prepare an action plan to address the prioritized community health problems
- Implement health promotion and disease prevention activities in a given community (Eg. Prison, school, institutionalized communities)

### **Module Objective**

At the end of this module, the comprehensive nurse student will be able to screen populations for priority health problems and participate in disease prevention and control activities at community level.

### **Supporting Objectives**

- Screen population groups for selected health problems such as (Communicable and none communicable disease, intestinal infestation, ,Sanitation problem, road traffic accident, immunization problem, postpartum home visit, dewarming, Vitamin A supplementation) (S4)
- Use effective communication and counseling strategies to promote health of individuals and groups (S4)
- Participate in disease prevention and control activities at PHCU outreach sites (such as Communicable and none communicable disease, intestinal infestation, ,Sanitation problem, road traffic accident, immunization problem, postpartum home visit dewarming, Vitamin A supplementation) (S4)
- Demonstrate clear, sensitive and effective communication skills in interaction with individuals families, communities, PHCU staff, local health department staff, peers and faculty (SA3)
- Demonstrate professional values and behavior in interaction with individuals, families and communities consistent with the future role of a comprehensive nurse (A3)

- Demonstrate key public health values, attitudes and behaviors such as commitment to equity and social justice, recognition of the importance of the health of the community as well as the individual, and respect for diversity, self-determination, empowerment, and community participation (A3)
- Show respect for peers and other healthcare professionals and the ability to foster a positive collaborative relationship with them (A3)
- Analyze community practice experience and perform practice-based improvement activities using a systematic methodology (K4)
- Demonstrate a habit of self-reflection, responsiveness to feedback and an on-going development of new skills, knowledge and attitude (A3)
- Search, collect, organize and interpret health and health-related information from different sources (A3)
- Use information and communication technology to assist in health promotion and disease prevention measures for individuals, and families (A3)

#### **Teaching-Learning Methods**

- ✦ Community survey and action planning
- ✦ Guided community practice
- ✦ Student presentation and discussion
- ✦ Portfolio
- ✦ PPRE

#### **Assessment Methods**

- Formative assessment method
- Logbook and portfolio
- Global rating midway during the attachment

#### **Summative assessment method**

- 360-degree evaluation of performance (60 %)
- Reflective portfolio (20 %)
- Personal research and reflection exercise (20 %)

Week	Activity
Week 1 -2	<p>Orientation to CBTP</p> <ol style="list-style-type: none"> <li>1. CBTP guideline &amp; procedure</li> <li>2. CBE guideline</li> <li>3. SRP guideline Preparation for field visit</li> <li>5. Definition of common terms (important terms)</li> <li>6. Determination of types of information needed a. Proposal development b. Development of data collection tool and gaining feedback from supervisor</li> <li>7. Duplicating and arranging data collection instrument</li> <li>8. Collecting and arranging reasonable logistics</li> <li>9. Identifying the community</li> </ol> <p>Screening populations (school children, prison at-risk-populations) and prioritize. Disease prevention and control in primary healthcare facilities and outreach sites such as (Communicable and non-communicable disease, intestinal infestation, skin infections, eye diseases, Sanitation problem, road traffic accident, immunization problem, postpartum home visit, deworming, exophthalmia)</p> <p>Home visits to sick individuals, postpartum women and newborns, patients with acute and chronic illness</p>
Week 3-4	<p>Analysis, report writing and presentation phase</p> <ol style="list-style-type: none"> <li>1. Data summarization</li> <li>2. Data analysis and interpretation</li> <li>3. Priority setting</li> <li>4. Developing action plan</li> <li>5. Report writing</li> <li>6. Gaining feedbacks</li> <li>7. Rehearsal</li> <li>8. Presentation in symposium &amp; defense</li> <li>9. Evaluate the learning experience and service provided to the community</li> </ol>

### References

1. Karen J. Marcante, Nelson Essentials of pediatrics, 6th edition ▪ Abuhay R. Satoskar et al. Medical parasitology. 2009 ▪ Color atlas of parasitology.
2. Goldman. Cecil Medicine. 23rd edition. 2007
3. Cunningham (et al). Williams Obstetrics. 23rd edition. 2010.
4. Bertram G. Katzung. Basic and clinical pharmacology. 12th edition. 2011
5. Carl Fertman and Diane Allensworth. Health promotion programs: from theory to practice. 2010
6. Lawrence Green, Marshall Kreuter. Health program planning: an educational and ecological approach. Volumes 1-2. 2005
7. Jackie Green, Tones. Health promotion: planning and strategies. 2010.
8. Mark Edberg. Essentials of health behavior: social and behavioral theory in public health. 2007
9. Richard D. Semba and Martin W. Bloem. Nutrition and health in developing countries. HumanPress. 2008
10. Goeffrey P Webb. Nutrition: a health promotion approach. 3rd edition.
11. Judith E. Brown. Nutrition through the life cycle. 4th edition. 2010.
12. Rosalind S. Gibson. Principles of nutritional assessment. 2nd edition. 2005

## MODULE NAME: MEDICAL SURGICAL NURSING-II

Module Code: NursM-3013

Module ECTS: 22

Credit hours: 13

Prerequisite: Foundation I and II, Medical Surgical Nursing - I theory and practice

Module summary

Module content	Weeks	Hours	ECTS
Total Duration	20	526	
Class room-based teaching	11	168	
SDL teaching		16	
PBL		26	
Clinical practice	8	320 (40hr/weeks)	
Exam period	1		
Module contents	<b>Hour Load</b>	<b>%Emphasis</b>	
<input type="checkbox"/> Nursing Health Assessment	168	32%	17
<input checked="" type="checkbox"/> Medical-Surgical Nursing theory			
<input type="checkbox"/> Skill lab (Total)			
<input checked="" type="checkbox"/> PBL			
<input type="checkbox"/> Medical Surgical Nursing II Clinical Practicum	316	60%	5
<b>Total</b>	<b>526</b>	<b>100%</b>	<b>22</b>

**Module Description:** This module is designed to help students to acquire knowledge of various medical and surgical disorders of the Integumentary, endocrine, genitourinary, cardiovascular and nervous system disorders and their treatment. It is also designed to enable students to assess, diagnose, plan, implement, monitor and evaluate the outcomes of nursing interventions provided for patients presenting with medical and/or surgical disorders. The module is also intended to help the students in understanding human behavior and in differentiating between normal and abnormal behavior. It also will help students to develop skills in therapeutic communication and in developing nurse-patient relationship and to manage, support, and rehabilitate patient with in the hospital and in the community.

## **Module competencies**

- Assess, diagnose, plan and manage patients with medical and surgical disorders of the Integumentary, endocrine, genitourinary, cardiovascular and nervous systems and be competent to provide individualized nursing care using nursing process as a framework., and evaluate outcomes using the nursing process as a framework
- Manage common emergencies and acute health problems
- Provide management and follow-up for chronic health problems
- Apply critical thinking, professionalism and problem-solving skill
- Use a critical inquiry process to support clinical judgment and clinical reasoning in nursing practice
- Make clinical decision in accordance to professional standards and scope of practice
- Recognize critical thinking and problem solving skills to provide health care services

**Module objective:** After completion of this module the students will be able to assess and manage various medical and surgical disorders of the Integumentary, endocrine, genitourinary, cardiovascular and nervous systems and be competent to provide individualized nursing care using nursing process as a framework. Furthermore, they will demonstrate skills in therapeutic communications in the health institution and in the community.

## **Supportive Objectives:**

At the end of the course the students will be able to:

- ✓ Define & classify Integumentary disorders
- ✓ Differentiate causative/risk/contributing factors of Integumentary disorders
- ✓ Describe the clinical manifestations of patients with Integumentary disorders
- ✓ Explain pathophysiologic process of Integumentary disorders
- ✓ Discuss diagnostic procedures/evaluations used in the diagnosis of Integumentary disorders



Explain the medical and or/surgical managements of patients with Integumentary disorders

- ✓ Apply nursing process in managing nursing care of patients with Integumentary disorders.
- ✓ Differentiate causative/risk/contributing factors of endocrine disorders.
- ✓ Describe the clinical manifestations of patients with endocrine disorders
- ✓ Explain pathophysiologic process of endocrine disorders
- ✓ Discuss diagnostic procedures/evaluations used in the diagnosis of endocrine disorders
- ✓ Explain the medical and/or surgical managements of patients with endocrine disorders
- ✓ Apply nursing process in managing nursing care of patients with endocrine disorders.
- ✓ Differentiate causative/risk/contributing factors of cardiovascular disorders
- ✓ Describe the clinical manifestations of patients with cardiovascular disorders
- ✓ Explain pathophysiologic process of cardiovascular disorders
- ✓ Discuss diagnostic procedures/evaluations used in the diagnosis of cardiovascular disorders
- ✓ Explain the medical and/ surgical managements of patients with cardiovascular disorders
- ✓ Apply nursing process in managing nursing care of patients with cardiovascular disorders.
- ✓ Differentiate causative/risk/contributing factors of genitourinary disorders
- ✓ Describe the clinical manifestations of patients with genitourinary disorders
- ✓ Explain pathophysiologic process of genitourinary disorders
- ✓ Discuss diagnostic procedures/evaluations used in the diagnosis of genitourinary disorders
- ✓ Explain the medical and/or surgical managements of patients with genitourinary disorders
- ✓ Apply nursing process in managing nursing care of patients with genitourinary disorders.
- ✓ Differentiate causative/risk/contributing factors of sexually transmitted infections
- ✓ Apply syndromic approach in the management of common sexually transmitted infections
- ✓ Differentiate causative/risk/contributing factors of neurologic disorders
- ✓ Explain pathophysiologic process of neurologic disorders
- ✓ Describe the clinical manifestations of patients with neurologic disorders

- ✓ Discuss diagnostic procedures/evaluations used in the diagnosis of neurologic disorders
- ✓ Explain the medical and/or surgical managements of patients with neurologic disorders
- ✓ Apply nursing process in managing nursing care of patients with neurological disorders.
- ✓ Demonstrate skills in therapeutic communications and counseling.
- ✓ Refer cases that require further investigation and treatment.

### **Teaching-Learning Methods**

- ✓ Interactive lecture and discussion
- ✓ Small group learning activities: assignment, exercise, case study
- ✓ Individual reading
- ✓ PHCU/Community-based learning and study trip: home visit, discussion with individuals and families to identify and solve problems, observation, PHCU visit, Zonal and District Health Department Visit, field visit, and targeted literature review based on community experience
- ✓ Use of computer applications and access to the internet
- ✓ Student presentation
- ✓ Personal research and reflection exercise (PRRE)
- ✓ Reflective portfolio and mentoring

### **Teaching –learning assessment methods Formative assessment**

- ✓ Quiz
- ✓ Assignment
- ✓ Seminar
- ✓ Project work
- ✓ Observation with checklist
- ✓ Logbook
- ✓ Dairy writing
- ✓ Nursing care plan

## Feedback on reflective portfolio

### Summative assessment of the overall module

1. Class room-based teaching =40%
  - ✦ Written test =25%
  - ✦ PBL=5%
  - ✦ SDL =10%
  - ✦ Total = 40%
2. Clinical and community practice = 60 %
3. Workplace based assessments) ----30% apply the appropriate one from the listed methods below
  - *Mini-Clinical Evaluation Exercise (mini-CEX)*
  - *Clinical Encounter Cards (CEC)*
  - *Clinical Work Sampling (CWS)*
  - *Blinded Patient Encounters (BPE)*
  - *Case-based Discussion (CbD)*
  - *MultiSource Feedback (MSF)*
  - *Direct Observation of Procedural Skills (DOPS)*
4. Review of portfolio= 12%
5. OSCE with oral =12%
6. Other student performance (seminar, CBD etc..) = 6%
7. Total =60%

### Module Schedule: Medical Surgical Nursing II

- ✓ Lecture + SDL + PBL = total hour of the week
- ✓ Clinical practice (week 13-18) =40hr/week

Module schedule

<b>Date/Week</b>	<b>Learning Activity</b>	<b>Time allotted</b>
week 1	<p><b>Interactive Lecture:</b></p> <p><b>Lecture And Discussion:</b></p> <p><b>Overview of the module</b></p> <p><b>Nursing intervention for patients with integumentary disorders (4hrs)</b></p> <ul style="list-style-type: none"> <li>✓ ..... Nursing assessment the integumentary system (hair, nail and skin glands) ...</li> <li>✓ Anatomy and Physiology overview of the integumentary system ✓ Common diagnostic methods</li> </ul> <p><b>Integumentary disorders (1hr)</b></p> <ul style="list-style-type: none"> <li>• Description</li> <li>• Risk factor/etiology</li> <li>• Pathophysiology</li> <li>• Classifications</li> <li>• Clinical manifestation</li> <li>• Diagnosis</li> <li>• Management (medical, surgical and/or nursing)</li> <li>• Prevention</li> <li>• Complications</li> </ul> <p><b>Burn injuries (2hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Skin lesions</li> </ul> <p><b>Inflammatory and allergic conditions of the skin (4hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Dermatitis</li> <li>✓ Eczema</li> <li>✓ Acne</li> <li>✓ Psoriasis</li> <li>✓ Scabies</li> </ul> <p><b>Infections of the skin (4 hrs)</b></p> <p><b>Bacterial</b></p> <ul style="list-style-type: none"> <li>✓ Boils</li> <li>✓ Carbuncle</li> <li>✓ Impetigo</li> <li>✓ Furuncle</li> <li>✓ Viral</li> </ul> <p>Skin Emergencies</p> <p><b>Herpes</b></p> <p><b>Fungal/mycosis</b></p> <ul style="list-style-type: none"> <li>✓ Tinea species</li> </ul> <p><b>Parasitic infections: Leishmaniasis (2 hrs)</b></p>	33 hrs./wk

	<p><b>Nursing Intervention of Patients with Endocrine Disorders (4 hrs) Lecture And Discussion: Overview of the module</b></p> <ul style="list-style-type: none"> <li>• Assessment of patient with endocrine disorder</li> <li>• Review of anatomy and physiology of endocrine system</li> <li>• Common diagnostic techniques <b>Endocrine system disorders</b></li> </ul> <ul style="list-style-type: none"> <li>• Definition</li> <li>• Risk factor/etiology</li> <li>• Pathophysiology</li> <li>• Classifications</li> <li>• Clinical manifestation</li> <li>• Diagnosis, management (medical, surgical and/or nursing) and prevention)</li> <li>• Complications</li> </ul> <p><b>Disorders of Thyroid gland (4hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Hypothyroidism</li> <li>✓ Hyperthyroidism</li> <li>✓ Iodine deficiency related goiter</li> <li>✓ Thyroiditis (acute and chronic)</li> </ul> <p><b>Disorders of parathyroid gland (2hrs)</b></p> <ol style="list-style-type: none"> <li>1. Hyperparathyroidism</li> <li>2. Hyperparathyroidism Endocrine emergencies</li> </ol>	
	<p><b>Skill lab: Assessment of the integumentary system ( 2hrs)</b> Assessment of the endocrine system</p>	
	<p><b>PBL (4 hr)</b></p>	
<p>week 2</p>	<p><b>Diabetes mellitus (4hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Definition</li> <li>✓ Risk factor/etiology</li> <li>✓ Pathophysiology</li> <li>✓ Classifications</li> <li>✓ Clinical manifestation</li> <li>✓ Diagnosis, management (medical, surgical and/or nursing) and prevention)</li> <li>✓ Complications</li> </ul> <p><b>Short term /immediate complications (2hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Insulin shock</li> <li>✓ Hypoglycemia</li> </ul>	<p>38 hrs./wk</p>

	<ul style="list-style-type: none"> <li>✓ DKA</li> <li>✓ HHNKS</li> <li><b>Long term complication (2hrs)</b></li> <li>✓ Neuropathy</li> <li>✓ Retinopathy</li> <li>✓ Nephropathy</li> <li>✓ Foot ulcer</li> <li><b>Nursing care of Patients with Genitourinary disorders (4hrs)</b></li> <li>✓ Overview of Anatomy and physiology of the Urinary tract</li> <li>✓ Assessments of clients with GUT problems,</li> <li>✓ Common diagnostic techniques</li> <li>✓ Elimination pattern</li> <li>✓ Sexuality and reproductive pattern</li> </ul>	
	<ul style="list-style-type: none"> <li><b>Acid-base imbalances (2hrs)</b></li> <li>✓ Respiratory acidosis</li> <li>✓ Respiratory alkalosis</li> <li>✓ Metabolic acidosis</li> <li>✓ Metabolic alkalosis</li> <li><b>Fluid and electrolyte imbalances (6hrs)</b></li> <li>✓ Fluid volume deficit</li> <li>✓ Fluid volume overload</li> <li>✓ Dehydration</li> <li>✓ Hyponatremia</li> <li>✓ Hypernatremia</li> <li>✓ Hypokalemia</li> <li>✓ Hyperkalemia</li> <li>✓ Hypocalcaemia</li> <li>✓ Hypercalcemia</li> <li>✓ Hypomagnesia</li> <li>✓ Hypermagnesia</li> <li><b>Genito-Urinary System Disorders (2hrs)</b></li> <li>✓ Definition</li> <li>✓ Risk factor/etiology</li> <li>✓ Pathophysiology</li> <li>✓ Classifications</li> <li>✓ Clinical manifestation</li> <li>✓ Diagnosis, management (medical, surgical and/or nursing) and prevention)</li> <li>✓ Complications</li> <li><b>Urinary tract Infections: (2 hrs)</b></li> <li><b>1. Lower UTI</b></li> <li style="padding-left: 20px;">a. Urethritis</li> <li style="padding-left: 20px;">b. Cystitis</li> </ul>	

	<p><b>2. Upper UTI (2hrs)</b>  a. Ureteritis</p>	
	<p>□ Pyelonephritis</p> <p><b>Glomerular diseases(2hrs)</b>  ✓ Glomerulonephritis  ✓ Nephrotic syndrome</p> <p>Application of Nursing process for a patient with DM (2hrs)</p> <p><b>Skill lab</b>  Assessment of the Genito-urinary System (<b>2 hrs</b>)  ✓ History taking &amp;P/E  ✓ Diagnostic methods the endocrine disorder</p> <p><b>PBL: 4hrs</b></p>	
<b>Week 3</b>	<p><b>Urolithiasis</b></p> <p><b>Renal failure: (7hrs)</b></p> <ul style="list-style-type: none"> <li>• Acute Renal failure</li> <li>• Chronic Renal failure</li> <li>• Benign Prostatic Hyperplasia (BPH)</li> <li>• Epididymitis</li> <li>• Hydrocele</li> <li>• Varicocele</li> <li>• Testicular torsion</li> </ul> <p><b>Sexually transmitted infections (6hrs)</b></p> <ul style="list-style-type: none"> <li>• Introduction to STI</li> <li>• Gonorrhoeae</li> <li>• syphilis</li> <li>• Chancroid</li> <li>• Chlamydia</li> <li>• LGV</li> <li>• Genital herpes</li> <li>• Candidiasis</li> <li>• Syndromic Management STI</li> </ul>	35 hrs./wk

	<p><b>Nursing care of patients with cardiovascular disorders (8hrs)</b>  Anatomy and Physiology overview  Nursing assessment of Cardiovascular system  activity exercise pattern,  Common diagnostic techniques  Nursing Intervention of Patients with cardiovascular Disorders  Anatomy and Physiology overview of the cardio-vascular system  Nursing assessment and examination of Cardiovascular system,  activity exercise pattern,  Common diagnostic techniques of cardiovascular system  Cardio-vascular system disorders (description, risk factor/etiology,  pathophysiology, classifications, clinical manifestation, assessment and  diagnosis, management (medical, surgical and/or nursing) and  prevention, complications)</p>	
	<p><b>Cardiovascular system disorders (4hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Definition</li> <li>✓ Risk factor/etiology</li> <li>✓ Pathophysiology</li> <li>✓ Classifications</li> <li>✓ Clinical manifestation</li> <li>✓ Diagnosis</li> <li>✓ Management (medical, surgical and nursing)</li> <li>✓ Prevention</li> <li>✓ Complications</li> </ul> <p><b>Cardiac Conduction /Electrical disorders (4 hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Sinus arrhythmia</li> <li>✓ Ventricular arrhythmia</li> <li>✓ Approach to patients with Cardiac Emergencies</li> </ul>	
	<p><b>Skill lab:</b> Assessment of the cardiovascular system (2 hrs) Diagnostic modalities of the GUS</p>	
	<p>▪ <b>PBL</b> 4hrs</p>	



week 4	<p><b>Coronary Artery Diseases (2hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Atherosclerosis</li> <li>✓ Arteriolosclerosis</li> <li>✓ Angina pectoris</li> <li>✓ Myocardial ischemia</li> <li>✓ Myocardial infarction</li> </ul> <p><b>Infectious/inflammatory disorders (1hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Rheumatic fever</li> </ul> <p><b>Valvular heart diseases (4 hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Mitral disorders</li> <li>✓ Aortic disorders</li> </ul> <p><b>Heart Diseases (6hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Heart failure</li> <li>✓ Acute pulmonary edema</li> <li>✓ Cardiac arrest</li> </ul> <p><b>Sample Nursing care plan for a patient with heart failure (2hrs)</b></p>	39 hrs./wk
	<p><b>Congenital heart disease (2hrs)</b></p> <p><b>Vascular Diseases</b></p> <p><b>Disorders of the arteries (2hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Hypertension</li> </ul> <p><b>Disorders of the veins (4hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Phlebothrombosis</li> <li>✓ Thrombophlebitis</li> <li>✓ Deep venous thrombosis (DVT)</li> <li>✓ Varicose veins</li> <li>✓ Venous insufficiency/venous ulceration</li> </ul> <p><b>Disorders of the lymphatic system (2hr)</b></p>	

	<ul style="list-style-type: none"> <li>• Elephantiasis</li> </ul> <p><b>Hematological and tissue perfusion disorders (6 hrs)</b></p> <p><b>RBC disorders</b></p> <ul style="list-style-type: none"> <li>• Anemia</li> <li>• Hemophilia</li> <li>• Polycythemia</li> </ul> <p><b>WBC disorders</b></p> <ul style="list-style-type: none"> <li>• Leukemia</li> <li>• Lymphoma: <ul style="list-style-type: none"> <li>◦ Non-Hodgkin’s lymphoma (NHL)</li> <li>◦ Hodgkin’s lymphoma (HL)</li> </ul> </li> </ul> <p><b>Platelet Disorders</b></p> <ul style="list-style-type: none"> <li>✓ Thrombocytopenia</li> <li>✓ Thrombocythemia</li> <li>✓ Shock</li> <li>✓ Infectious</li> <li>✓ Malaria</li> </ul> <p><b>Sample Nursing care plan for a patient with hypertension (2hrs)</b></p>	
	<b>Skill lab: 2 hrs</b>	
	<b>PBL: 4hrs</b>	
week 5	<p><b>Nursing care of Patients with Neurologic Disorders (2hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Anatomy and physiology review</li> <li>✓ Assessment examination neurologic problem</li> <li>✓ Sensory and perception pattern</li> <li>✓ Common diagnostic techniques</li> <li>✓ Neurological Disorders</li> </ul> <p><b>Neurologic system disorders (2hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Definition</li> <li>✓ Risk factor/etiology</li> <li>✓ Pathophysiology</li> <li>✓ Classifications</li> <li>✓ Clinical manifestation</li> <li>✓ Diagnosis</li> <li>✓ Management (medical, surgical and nursing)</li> <li>✓ Complication</li> <li>✓ Neurologic care</li> </ul> <p><b>Neurologic disorders..... (6hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Headache</li> <li>✓ Cerebro-vascular accident (CVA) ◦ Ischemic stroke ◦ Hemorrhagic stroke</li> <li>✓ Increased intra cranial pressure (1hrs)</li> <li>✓ Seizures (2hrs)</li> <li>✓ Infectious neurological problems (6hrs) ✓ Meningitis</li> </ul>	31 hrs./wk

	<ul style="list-style-type: none"> <li>✓ Tetanus</li> <li>✓ Rabies</li> <li>✓ Anthrax</li> <li>✓ Poliomyelitis</li> <li>✓ Toxoplasmosis</li> </ul> <p><b>Autoimmune disorders (4hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Myasthenia Gravis</li> <li>✓ Guillain-Barre syndrome</li> </ul> <p><b>Nursing care plan for a patient with Stroke (2hrs)</b></p>	
	<b>SDL 2 Hrs PBL: 4 hrs</b>	
week 6	<p><b>Cranial nerve disorders (12hrs)</b></p> <ul style="list-style-type: none"> <li>✓ Bell's palsy</li> <li>✓ Traumatic lesions <ul style="list-style-type: none"> <li>• Head injury</li> <li>• Brain injury</li> <li>• Spinal cord trauma</li> </ul> </li> </ul> <p><b>Degenerative disorders (4 hrs)</b></p> <ul style="list-style-type: none"> <li>• Parkinsonism</li> <li>• Alzheimer's Disease</li> </ul> <p>Common geriatric disease</p> <p><b>Sexually transmitted infections (6hrs)</b></p> <p>Genital herpes</p> <p>Hepatitis b</p> <p>Candidacies</p> <p>Using syndromic STI management</p> <p><b>Sample Nursing care plan for a patient with head injury (2hrs)</b></p>	30 hrs./wk
	<b>Skill lab: (2 hrs)</b>	
	<ul style="list-style-type: none"> <li>✓ History taking and physical examination</li> </ul>	
	<b>PBL: 4hrs</b>	
	<b>Week 7: Exam</b>	
<b>Week 8-18</b>	<b>Hospital Practice</b>	

	<ul style="list-style-type: none"> <li>✓ Assessment of the integumentary system</li> <li>✓ History taking and physical examination</li> <li>✓ Observation and nursing management of Inflammatory and allergic conditions of the skin using nursing process</li> <li>✓ Nursing care plan for Infectious neurological problems ✓ Nursing care plan for Autoimmune disorders:</li> <li>✓ Nursing care plan for Hematological and tissue perfusion disorders</li> <li>✓ Observation of diagnostic methods in managing neurological problem</li> <li>✓ Medication Administration</li> <li>✓ Monitoring pt vital sign intake out put</li> <li>✓ Observation of intracranial pressure (ICT)</li> <li>✓ Observation of pt resuscitations</li> <li>✓ Observation and management of seizure</li> </ul>
	<p><b>Teaching –learning methods and activities</b></p> <ul style="list-style-type: none"> <li>✓ Guided practice (coaching)</li> <li>✓ Seminar presentation / assignment/project /report</li> <li>✓ Group discussion following exposure to any learning experience</li> <li>✓ Independent study and practice</li> </ul>
	<p><b>Teaching –learning assessment methods</b></p> <ul style="list-style-type: none"> <li>✓ Workplace based assessments) ----30% select the applicable one  <i>Mini-Clinical Evaluation Exercise (mini-CEX)</i>  <i>Clinical Encounter Cards (CEC)</i>  <i>Clinical Work Sampling (CWS)</i>  <i>Blinded Patient Encounters (BPE)</i>  <i>Case-based Discussion (CbD)</i>  <i>MultiSource Feedback (MSF)</i>  <i>Direct Observation of Procedural Skills (DOPS)</i></li> <li>✓ Review of portfolio === 12%</li> <li>✓ OSCE and oral exam—12%</li> <li>✓ Seminar presentation == 6%</li> </ul>
<b>Week 19-20</b>	<b>Final Exam and OSCE</b>

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# MATERNITY & REPRODUCTIVE HEALTH NURSING MODULE

## Module Syllabus

**Module Name:** Maternity and Reproductive Health Nursing

**Module Code:** NursM-3023 ECTS:

**14**

**Credit: 9 Cr hr.**

### Module summary

Total module duration	Weeks	Total hours	ECTS
	11 weeks	339	
<input type="checkbox"/> Class room-based teaching (lecture)	1-6 weeks	102	
<input type="checkbox"/> PBL	2-6weeks	20	
<input type="checkbox"/> SDL (clinical lab) teaching	2-6 weeks	19	
<input type="checkbox"/> Clinical practice	8-11 weeks	169	
<input type="checkbox"/> Exam and student self-study	7 <sup>th</sup> week	20	
Course contents contributed to the module	Hour Load	% Emphasis	
<input type="checkbox"/> Reproductive Health Nursing	20 hrs.	30%	11
<input type="checkbox"/> Maternity Nursing	82 hrs.		
<input type="checkbox"/> PBL	34 hrs.	10%	
<input type="checkbox"/> SDL (clinical lab)	34 hrs.	10%	
<input type="checkbox"/> Maternity Nursing Practicum	169 hrs.	50%	
<b>Total</b>	<b>339 hrs.</b>	<b>100%</b>	<b>14</b>

### Module Description:

This module is designed for BSc Nursing students to acquire necessary knowledge, attitude and skills for assessing, diagnosing and managing mothers with pregnancy and pregnancy related problems, labor and related complications, gynecologic problems and providing comprehensive care for women before and during pregnancy, labor and delivery, postpartum period, care for a patient with gynecology problem using nursing process as frame work. In addition, this module is designed to help BSc nurse students to address reproductive health rights and needs of the community.

### Module's Objectives By the end of these modules, students will be able to

- ✓ Provide high quality, acceptable comprehensive reproductive health services.
- ✓ Provide high quality culturally sensitive comprehensive care for women before and during pregnancy, during labor and delivery and postpartum period

- ✓ Provide high quality, culturally sensitive, individualized care for patient with gynecologic problem

**Module Competency Description:**

Nurses provide standardized, compassionate and respectful Nursing care for women and their fetus during labor and delivery and provide immediate newborn care. In order to achieve this competency, the nurse graduates are expected to:

- ✓ Apply human rights principle, sexual and reproductive health and their effects on health of individuals
- ✓ Provide pre pregnancy care and counseling for a woman to promote healthy pregnancy and positive parenting
- ✓ Diagnose and manage normal pregnancy
- ✓ Diagnose and manage minor disorders of pregnancy
- ✓ Diagnose and manage common medical and surgical disorders during pregnancy
- ✓ Provide PMTCT services
- ✓ Diagnose and manage abnormal pregnancy
- ✓ Conduct normal labor and delivery
- ✓ Manage abnormal labor and delivery
- ✓ Manage complications of third stage of labor
- ✓ Manage obstetrics emergencies during labor and delivery
- ✓ Perform/Assist instrumental delivery
- ✓ Perform pre and post-operative care
- ✓ Perform episiotomy
- ✓ Provide immediate newborn care
- ✓ Provide postpartum nursing care
- ✓ Provide comprehensive abortion care
- ✓ Provide nursing care for common gynecology problems



## Supporting Objectives

To meet the above modules' objective, the student will be able to:

- Recognize the concepts of reproductive health
- Describe reproductive rights
- Identify and explain the components of Reproductive Health
- Elaborate Gender based Violence and its implication on health and development
- Discuss Adolescent Reproductive Health
- Describe the indicators of reproductive health
- Describe the anatomy of female reproductive system
- Explain the physiology of female reproductive system
- Relate the bony pelvis and other reproductive organs to pregnancy and delivery
- Provide preconception care and counselling
- Discuss conception, fetal and placental development
- Discuss the physiology of placenta, membranes and fetal circulation
- Outline the physiological changes that take place during pregnancy
- Provide women friendly Focused Antenatal care using WHO guideline
- Take a complete initial and on-going history and physical examination for each antenatal visit and make appropriate referral
- Assess and follow maternal, fetal wellbeing and progress of labor using partograph
- Apply active management of third stage of labour (AMTSL)
- Provide immediate newborn care and resuscitation
- Describe the physiology of normal puerperium
- Perform post natal care
- Provide family planning services and counselling
- Diagnose and manage minor disorders of pregnancy
- Assess and identify abnormal pregnancy and associated complications
- Manage obstetric emergencies
- Provide PMTCT service for pregnant, labouring and post natal mothers
- Provide contraceptive methods appropriate for HIV + ve clients
- Demonstrate infection prevention and patient safety while managing obstetric and gynecological clients
- Assess, diagnose and provide nursing care for women with abnormal pregnancy (hyper emesis gravidarum, amniotic fluid disorders)
- Assess, diagnose and provide nursing care for women with Hypertensive disorders of pregnancy
- Recognized the etiology pathophysiology and the nursing care of women with Antepartum hemorrhage
- Provide nursing care for a pregnant women with A.B.O and Rhesus incompatibility

- Assess, diagnose and provide nursing care for a women with medical disorders associated with pregnancy
- Provide the nursing care for a pregnant women with multiple pregnancies
- Manage cord prolapse and cord presentation
- Identify malposition
- Identify malpresentations and their complications
- Discuss prolonged and obstructed labour
- Provide nursing care for a women with uterine rupture
- Provide nursing care for a women with Premature Rupture of Membrane/ PROM
- Provide the care of women with operative deliveries
- Mange Postpartum hemorrhage
- Assess, diagnose and provide nursing care for a women with abnormal puerperium
- Assess, diagnose and provide nursing care for a women with early pregnancy bleeding
- Assess, diagnose and provide nursing care for a women with abnormal uterine bleedings
- Assess, diagnose and provide nursing care for a women with menopause and infertility
- Assess, diagnose and provide nursing care for a women with tumor and malformations of the female genital tract
- Critically review, appraise and apply new information, including research findings, relevant to nursing practice

### **Teaching and learning methods**

- |                                      |   |
|--------------------------------------|---|
| ✓ Interactive lecture and discussion | ✓ Video show                                |
| ✓ Small group discussion             | ✓ Demonstration                             |
| ✓ Role play                          | ✓ Seminar presentation                      |
| ✓ Case study                         | ✓ Guided clinical practice (Hospital Visit) |
| ✓ Bedside discussion                 | ✓ PBL cases                                 |
| ✓ Self-study                         | ✓ Clinical nursing round                    |
| ✓ Portfolio                          | ✓ Nursing care plan development             |
| ✓ Clinical simulation                |   |

### **Teaching-Learning Materials**

- |                                     |                         |
|-------------------------------------|-------------------------|
| ✓ Learning guides & checklists      | ✓ Laptop and Videotapes |
| ✓ Text books                        | ✓ Pregnant doll         |
| ✓ Reference manual                  | ✓ Measuring tap         |
| ✓ National manuals and guidelines   | ✓ BP apparatuses        |
| ✓ Writing board, posters and charts | ✓ Wight scale           |
| ✓ Anatomic models & simulators      | ✓ HMIS antenatal format |
| ✓ LCD Projector                     | ✓ Parthograph           |
| ✓ White board, marker               |                         |

**Methods of assessment Formative assessment**

- ✓ Drills, essay exams, quizzes
- ✓ Structured feedback report
- ✓ PBL case
- ✓ Structured feedback report

- ✓ Logbook and Portfolio
- ✓ Oral exam
- ✓ Case studies
- ✓ OSCE and OSPE
- ✓ 360<sup>0</sup> evaluation

**Summative assessment**

- ✓ Written exam -----30%
- ✓ PBL-----10%
- ✓ SDL/OSCE -----10%
- ✓ Oral Examination-----10%
- ✓ DOP (seminar, bed side, case presentation) -----30%
- ✓ Review of portfolio (nursing care plan) -----10%
- ✓ Total -----100%

**Module Policy**

- **Attendance:** It is compulsory to attend lecture, SDL and Hospital clinical practice on time and every time. If students are going to miss more than three classes during this semester, they will not be allowed to sit for final assessment and next semester unless otherwise proven by evidence per legislation requirement. 100% attendance is mandatory for clinical practice, PBL and SDL.
- **Assignments and projects:** Students must complete module assignments and work based assessments on time. Uncompleted work-based assessments and assignments will result in Incomplete (I) grade submissions to registrar. Further consecutive procedures will be handled in line with institutional senate legislation.

■  
**Module delivery schedule**

- Lecture and discussion + PBL + SDL = 6weeks
- Exam week=1 week
- Clinical practice =4 weeks

Date/Week	Learning Activity	Required Reading (Assignment)
Day 1/Week 1	<b>Introduction/Overview of the module (30 min)</b>	
Week 1	<b>Interactive lecture and discussion: 5:30 Hrs. Introduction to Reproductive Health(RH)</b>  <ul style="list-style-type: none"> <li>✓ Concepts of reproductive health</li> <li>✓ Magnitude of Reproductive Health Problem (Morbidity and mortality)</li> <li>✓ Causes of maternal morbidity and mortality</li> <li>✓ Components of Reproductive Health and reproductive rights</li> <li>✓ Maternal health services</li> <li>✓ Reproductive health indicators</li> </ul>	National RH strategy
	<b>Interactive lecture and discussion: 3hr. Harmful Traditional Practices</b>  <ul style="list-style-type: none"> <li>• Female Genital Mutilation (FGM)</li> <li>• Early Marriage</li> <li>• Provide health education on harmful Traditional Practices</li> </ul>	Abduction
	<b>Interactive lecture and discussion: 3 Hrs. Adolescent Reproductive Health</b> <ul style="list-style-type: none"> <li>• Global Youth Today</li> <li>• Reproductive Health Risks and consequences for adolescents</li> <li>• Adolescent and youth strategy</li> <li>• Adolescent Reproductive Health Services</li> </ul>	Causes for early unprotected sexual intercourse in adolescents
	<b>Interactive lecture and discussion: 2 Hrs. Gender based Violence</b> <ul style="list-style-type: none"> <li>✓ Definition</li> <li>✓ Gender and RH</li> <li>✓ Types of GBV</li> <li>✓ Consequences of GBV</li> <li>✓ Intervention of GB</li> </ul>	

Week 1	<b>Interactive lecture and discussion: 4Hrs.</b> <ul style="list-style-type: none"> <li>✓ Introduction to Obstetrics and Gynaecology Nursing</li> <li>✓ Anatomy and physiology of female reproductive system</li> <li>✓ Introduction to embryology and fetal development</li> </ul>	Reflective portfolio 22 hrs/wk
	<ul style="list-style-type: none"> <li>✓ Definitions and Terminologies</li> <li>✓ The female pelvis</li> <li>✓ The female reproductive organs</li> <li>✓ The menstrual cycle</li> <li>✓ Preconception care</li> <li>✓ Early development of fetus</li> <li>✓ Conception</li> <li>✓ Placenta,</li> <li>✓ Fetal circulation</li> <li>✓ Fetal skull</li> </ul>	
	<b>SDL: 2Hrs</b> The female pelvis Fetal circulation Video show	
	<b>PBL 4hrs</b>	
Week 2	<b>Interactive lecture and Discussion : 4Hrs</b> <b>NORMAL PREGNANCY</b> <ul style="list-style-type: none"> <li>✓ Physiological and psychological changes in pregnancy</li> <li>✓ Minor disorders of pregnancy</li> <li>✓ History taking and Physical examination of pregnant woman</li> <li>✓ ANC</li> <li>✓ Maternal nutrition</li> <li>✓ Antepartum Nursing assessment, Nursing diagnoses, Plan and Intervention</li> </ul>	15hrs/wk
	<b>Skill lab (2hrs)</b> Physical examination for a pregnant women focusing on abdominal examination (Leopold's manoeuvre) ANC guideline Role play	

	<p>Interactive lecture and Discussion: <b>10 Hrs.</b></p> <p><b>ABNORMAL PREGNANCY</b></p> <ul style="list-style-type: none"> <li>✓ <b>Hyperemesis gravidarum, Polyhydramnios and oligohydramnios</b> <ul style="list-style-type: none"> <li>• Nursing assessment, Nursing diagnosis, intervention for women with <b>Hyperemesis Gravidarum</b></li> </ul> </li> <li>✓ <b>PIH (gestational hypertension, preeclampsia, eclampsia) chronic hypertension</b> <ul style="list-style-type: none"> <li>• Nursing assessment, Diagnosis and intervention for women with <b>Hypertensive disorder of pregnancy</b></li> </ul> </li> <li>✓ <b>Antepartum haemorrhage</b> <ul style="list-style-type: none"> <li>• Placenta praevia</li> <li>• Placenta abruption</li> <li>• Nursing assessment, Diagnosis &amp; intervention for women with APH</li> </ul> </li> <li>✓ <b>A.B.O and Rhesus incompatibility</b></li> <li>✓ <b>Diseases associated with pregnancy</b></li> </ul>	15hrs/wk
	<ul style="list-style-type: none"> <li>• Anaemia in pregnancy</li> <li>• Cardiac disease in pregnancy</li> <li>• Diabetes mellitus in pregnancy</li> <li>• Malaria in pregnancy</li> <li>• Pulmonary tuberculosis in pregnancy</li> <li>• Nursing assessment, Diagnosis and intervention for women having medical disorder in pregnancy</li> </ul> <p><b>PBL: 4 Hrs: A case of preeclampsia</b></p>	
Week 3	<p><b>Interactive lecture and discussion: 16 Hrs</b></p> <p><b>Normal Labour</b></p> <ul style="list-style-type: none"> <li>✓ Definitions and descriptions of labour (Introduction, clinical onset of labor, True and false labor, Durations of labor)</li> <li>✓ Physiology of the first stage of labour</li> <li>✓ Management of the first stage of labour</li> </ul>	Reflective portfolio 15hrs/wk

	<ul style="list-style-type: none"> <li>✓ Physiology and mechanism of second stage of labour</li> <li>✓ Episiotomy, Perineal lacerations</li> <li>✓ Physiology of the third stage of labour</li> <li>✓ AMTSL (Active Management of the third stage of labour )</li> <li>✓ Pharmacological &amp; Nonpharmacological Pain Management During Labor</li> <li>✓ Birth-Related Procedures</li> </ul>	
	<p><b>Skill Lab: 3 Hrs</b></p> <ul style="list-style-type: none"> <li>✓ Normal labour simulation</li> <li>✓ Partograph</li> </ul>	<b>Intrapartum fetal monitoring</b>
Week 4	<p><b>Interactive lecture and discussion: 2 Hrs</b></p> <ul style="list-style-type: none"> <li>✓ Essential new-born care</li> <li>✓ Nursing Care of the new-born baby at birth</li> <li>✓ APGAR score, Asphyxia and Resuscitation</li> <li>✓ Nursing Assessment of the new born</li> <li>✓ The new born at Risk: Conditions Present at Birth</li> <li>✓ The new born at Risk: Birth-Related Stressors</li> </ul>	Reflective portfolio 15hrs/wk
	<p><b>Skill Lab: 2 Hrs</b></p> <p>Essential new born care Newborn resuscitation</p>	
Week 4	<p><b>Interactive lecture and discussion: 9Hrs</b></p> <p><b>Abnormal Labour</b></p> <ul style="list-style-type: none"> <li>✓ Introduction to abnormal labor</li> <li>✓ Malpositions and malpresentation</li> <li>✓ Multiple pregnancies <ul style="list-style-type: none"> <li>○ Cord presentation and cord prolapse</li> <li>○ Nursing assessment, Nursing diagnoses, and intervention for women with multiple pregnancy, prolapsed of cord, malposition</li> </ul> </li> <li>✓ Induction and augmentation of labour</li> <li>✓ Complications of labour</li> <li>✓ Cephalopelvic disproportion</li> </ul>	Trial of labour

	<ul style="list-style-type: none"> <li>✓ Prolonged labour, Obstructed labour, Uterine rupture,</li> <li>✓ Premature Rupture of Membrane/PROM ○ Nursing assessment, Nursing diagnoses, and intervention for a woman with PROM</li> <li>✓ Operative deliveries ○ Vacuum extraction and Forceps delivery ○ Caesarean section, Destructive deliveries <ul style="list-style-type: none"> <li>Versions <ul style="list-style-type: none"> <li>○ Nursing assessment, Nursing diagnoses, and intervention for a woman undergoing operative deliveries</li> </ul> </li> </ul> </li> <li>✓ Complications of the third stage of labour ○ <i>Post-partum haemorrhage (PPH)</i> <ul style="list-style-type: none"> <li>○ Retained placenta</li> <li>○ Adherent placenta,</li> <li>○ Amniotic fluid embolism,</li> <li>○ Obstetric shock</li> </ul> </li> <li>✓ Nursing assessment, Nursing diagnoses, and intervention for a woman with complications of third stage of labor</li> </ul>	
	<ul style="list-style-type: none"> <li>intervention for women with multiple pregnancy, prolapsed of cord, malposition</li> <li>✓ Induction and augmentation of labour</li> <li>✓ Complications of labour</li> <li>✓ Cephalopelvic disproportion</li> <li>✓ Prolonged labour, Obstructed labour, Uterine rupture,</li> <li>✓ Premature Rupture of Membrane/PROM ○ Nursing assessment, Nursing diagnoses, and intervention for a woman with PROM</li> </ul>	



	<ul style="list-style-type: none"> <li>✓ Operative deliveries <ul style="list-style-type: none"> <li>○ Vacuum extraction and Forceps delivery</li> <li>○ Caesarean section, Destructive deliveries</li> </ul> </li> <li>    Versions <ul style="list-style-type: none"> <li>○ Nursing assessment, Nursing diagnoses, and intervention for a woman undergoing operative deliveries</li> </ul> </li> <li>✓ Complications of the third stage of labour <ul style="list-style-type: none"> <li>○ <i>Post-partum haemorrhage (PPH)</i> <ul style="list-style-type: none"> <li>○ Retained placenta</li> <li>○ Adherent placenta,</li> <li>○ Amniotic fluid embolism,</li> <li>○ Obstetric shock</li> </ul> </li> </ul> </li> <li>✓ Nursing assessment, Nursing diagnoses, and intervention for a woman with complications of third stage of labor</li> </ul>	
	<p>Skill Lab: 2 Hrs.  <b>Vacuum and Forceps delivery</b></p>	
	<p><b>PBL: 4 Hrs.: A case of Postpartum haemorrhage (PPH)</b></p>	
<p>Week 5</p>	<p><b>Interactive lecture and discussion: 8 Hrs</b></p> <p><b>Normal puerperium</b></p> <ul style="list-style-type: none"> <li>✓ Physiology of the puerperium</li> <li>✓ Management of puerperium</li> <li>✓ Anatomy and physiology of the breast and postpartal Adaptation and Nursing</li> </ul> <p><b>Postnatal care</b></p> <ul style="list-style-type: none"> <li>✓ Assessment, The Postpartal Family, Needs and Care, Home Care of the Postpartal Family <b>Lactation</b></li> <li>✓ Management of breast feeding (Attachment, Positioning and suckling)</li> </ul> <p><b>Abnormal Puerperium</b></p>	

	<ul style="list-style-type: none"> <li>✓ Breast complications, Puerperal psychosis, <i>Puerperal sepsis</i>, Urinary complications, Thrombophlebitis.</li> </ul>	
	<ul style="list-style-type: none"> <li>○ Nursing assessment, Nursing diagnoses, and intervention for abnormal puerperium.</li> </ul> <p><b>Skill lab (1hrs)</b> Breast feeding techniques</p> <p><b>PBL: 4hr: A case of Puerperal sepsis</b></p>	

Week5	<p><b>Interactive lecture and discussion : 4 Hrs</b></p> <p><b>Contraceptive methods</b></p> <ul style="list-style-type: none"> <li>✓ Counselling in FP (REDI framework)</li> <li>✓ Types of family planning <ul style="list-style-type: none"> <li>○ Natural FP methods (LAM, Fertility awareness method, withdrawal methods)</li> </ul> </li> <li>✓ Barrier Methods of family planning <ul style="list-style-type: none"> <li>○ Male Condoms</li> <li>○ Female Condoms</li> </ul> </li> <li>✓ <b>Hormonal Methods of family planning</b> <ul style="list-style-type: none"> <li>○ -Oral contraceptives</li> <li>○ -Injectable</li> </ul> </li> <li>✓ <b>Long acting family planning methods</b> <ul style="list-style-type: none"> <li>○ Implanon plus</li> <li>○ Jadelle</li> <li>○ Sinoplant</li> <li>○ IUCD <ul style="list-style-type: none"> <li>▪ Intrauterine device (non-hormonal type)</li> </ul> </li> </ul> </li> <li>✓ Emergency contraceptive <ul style="list-style-type: none"> <li>○ Emergency contraceptive pills (ECPs)</li> <li>○ Intrauterine devices (IUDs)</li> </ul> </li> <li>✓ Permanent Methods of family planning <ul style="list-style-type: none"> <li>○ Tubal ligation</li> <li>○ Vasectomy</li> </ul> </li> <li>✓ Managing side effects and other problems</li> </ul>	<ul style="list-style-type: none"> <li>✓ Spermicides      Cervical Cap</li> <li>✓ Diaphragm      Intrauterine device</li> <li>✓ Foam tablets (hormonal type)</li> <li>✓ planning</li> <li>✓ Helping clients continue or switch methods.</li> <li>✓ Misconception in FP      discontinuing</li> <li>✓ Reason      e y</li> <li>contraceptives</li> <li>Infection</li> <li>prevention in</li> <li>Family for</li> </ul>
	<p><b>Skill lab (3hrs)</b></p> <p>REDI framework: Role play</p> <p>Long term family planning methods insertion and removal</p>	

Week 5	<p><b>Interactive lecture and discussion: 3 Hrs.</b></p> <p><b>Mother to child prevention of HIV</b></p> <ul style="list-style-type: none"> <li>✓ Overview of MTCT</li> <li>✓ Guiding principles of PMTCT program</li> <li>✓ Obstetric measures preventing MTCT during pregnancy, labour, delivery and postpartum period</li> <li>✓ Infant feeding options for infants born to HIV +ve mothers.</li> <li>✓ Counselling (Pre &amp; Post, Pre-treatment counselling)</li> </ul>	<p>Monitoring and evaluation in HIV/AIDS</p> <p>National strategies and guidelines to address MTCT of HIV/AIDS</p>
	<p><b>PBL:- (4hrs): A case to PMTCT-Lost to follow up</b></p>	
Week 6	<p><b>Interactive lecture and discussion: 18 Hrs. Gynaecology: 6 Hrs</b></p> <ul style="list-style-type: none"> <li>✓ Introduction, definitions and description of terms</li> <li>✓ Abnormal uterine bleeding</li> <li>✓ <i>Pelvic inflammatory disorder (PID)</i></li> <li>✓ Ectopic pregnancy</li> <li>✓ Abortion</li> <li>✓ Hydatidiform mole</li> <li>✓ Endometriosis</li> <li>✓ Infertility <ul style="list-style-type: none"> <li>• Nursing assessment, diagnoses, and intervention for woman gynaecology problems.</li> </ul> </li> <li>✓ <b>Tumours of the female genital tract: 6hrs</b> <ul style="list-style-type: none"> <li>• Breast Ca</li> <li>• Premalignant and malignant disease of the cervix</li> <li>• Ovarian Ca</li> <li>• Cancer of the uterine corpus</li> </ul> </li> <li>✓ Nursing assessment, diagnoses, and intervention for woman w tumors of female genital tract.</li> <li>✓ <b>Genito-urinary Complications: 2hrs</b> <ul style="list-style-type: none"> <li>• Prolapse of the uterus</li> <li>• Rectovaginal fistula (RVF)</li> <li>• Vesicovaginal fistula (VVF)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>✓ Disease associated with menopause</li> <li>✓ Malformations of the female genital tract</li> <li>✓ Uterine, Tubal, Vaginal malformation</li> <li>✓ Imperforated hymen, Retro version of the uterus hymen, Retro version of the uterus</li> <li>✓ Benign diseases of the vagina, cervix and ovary</li> <li>✓ Benign disease of the uterus</li> </ul>

	<ul style="list-style-type: none"> <li>✓ Nursing assessment, diagnoses, and intervention for woman with Genito-urinary Complications</li> </ul>	
	<b>Skill lab (4 hrs)</b> <ul style="list-style-type: none"> <li>✓ Manual vacuum aspirations (MVA) and Medication Abortion (MA)</li> <li>✓ Breast self-examination of (BSE), Mamography, Visual inspection of acetic acid (VIA).</li> </ul>	15hrs/wk
	<b>PBL:- (4 hrs): A case on Pelvic inflammatory diseases</b>	
Week 7-11	<b>Hospital Practices (192 hrs)</b>	
	<b>Objectives:</b> At the end of the attachment period the student will be able to:	
	<ul style="list-style-type: none"> <li>✓ Attend orientation on (learning outcome, code of conduct, assessment policies,&amp; setting )</li> <li>✓ Perform registration using various formats</li> <li>✓ Take history</li> <li>✓ Conduct physical examination</li> <li>✓ Identify danger sign during pregnancy</li> <li>✓ Request and interpret ANC related lab</li> </ul>	<ul style="list-style-type: none"> <li>✓ Admit a mother in labour after making complete nursing assessment</li> <li>✓ Distinguish between true and false labour</li> <li>✓ Perform abdominal examination and interpret each step</li> </ul>

	<p>investigation</p> <ul style="list-style-type: none"> <li>✓ Assist insertion and removal of long-acting contraceptives</li> <li>✓ Provide women friendly ANC services</li> <li>✓ Apply PMTCT during pregnancy, labor and postpartum period.</li> <li>✓ Provide short acting FP methods and insert and remove of long acting contraceptives</li> <li>✓ Interpret ANC related lab investigation</li> <li>✓ Give Health Education</li> <li>✓ Conduct FP Counselling</li> <li>✓ Present Seminar</li> <li>✓ Provide nursing care such as Vital sign, IV secure, catheterization, medication administration, blood transfusion,</li> <li>✓ Assist, conduct and manage normal labour and delivery (diagnosis, follow normal labour using partograph</li> <li>✓ Perform and repair an episiotomy</li> <li>✓ Perform AMTSL, and immediate new born care</li> <li>✓ Provide postnatal care and health education</li> <li>✓ Assist the mother in breast feeding</li> <li>✓ Observe abnormal labour and delivery follow up and managements</li> <li>✓ Provide Post Abortion care</li> <li>✓ Take Gynaecologic history using nursing process as framework</li> <li>✓ Take Gynaecologic history using nursing approach</li> <li>✓ Assist in diagnosis of abnormal pregnancy, labour and delivery where beyond scope consult or refer</li> </ul>	<ul style="list-style-type: none"> <li>✓ Differentiate between the various stages of labour</li> <li>✓ Demonstrate vaginal examination and interpret findings</li> <li>✓ Observe the general condition of the mother and fetus and meet the psychological and physiological needs of the mother</li> <li>✓ Demonstrate nursing skills and professional attitude in the daily activities of the clinical area</li> <li>✓ presentation case and seminars</li> <li>✓ Bedside case discussion</li> <li>✓ Conducting nursing round</li> <li>✓ Provide nursing care such as Vital sign, IV secure, catheterization, medication administration, blood transfusion, wound care ...</li> <li>✓ Follow the principles of infection prevention and standard precaution while performing any procedure.</li> <li>✓ Discussion on selected cases</li> </ul>
<b>Week 12</b>	<b>Final Exam and OSCE</b>	

## PRACTICAL EVALUATION FORMAT FOR MATERNITY WARD

Name of the student \_\_\_\_\_ Date \_\_\_\_\_

Score \_\_\_\_\_

Instructor \_\_\_\_\_ Sign \_\_\_\_\_

S.No.	Evaluation Criteria	Rating Scales					Remarks
		1	2	3	4	5	
<b>I</b>	<b>ATTITUDE TOWARDS PROFESSIONAL AND ETHICAL STANDARDS</b>						
1.1	Punctuality						
1.2	Completeness of the uniform						
1.3	Neatness and grooming						
1.4	Ability to identify own responsibility						
1.5	Ability to work harmoniously with other colleagues and ward staff						
1.6	Ability to take responsibility for own action						
1.7	Reports when temporarily leaving the work area						
<b>II</b>	<b>DAILY NURSING CARE ACTIVITIES</b>						
2.1	Takes history of the client in labour						
2.2	Performs physical examination for the client in labour						
2.3	Records and interprets all the findings on partograph						
2.4	Makes accurate observations on mother in labour						
2.5	Keeps the client's unit as clean and in order as possible						
2.6	Keeps the mother as clean and dry as possible throughout the labour process						
2.7	Understands the physical and psychological needs of the mother in labour and addresses it accordingly						
2.8	Prepares the delivery sets and other necessary materials in the delivery room						
2.9	Performs and repairs episiotomy						
2.10	Conducts normal labour						
2.11	Gives the immediate care of the newborn						
2.12	Assesses, records & interprets the Apgar score of the newborn						
2.13	Safeguards the newborn from hazards (cold, falling)						
2.14	Conducts the third stage of labour appropriately applying one of the methods of expelling the placenta						

2.15	Carries out an appropriate placental and membranes examination for its completeness						
2.16	Provides immediate postnatal nursing care for the mother						
2.17	Demonstrates and helps the mother in breast feeding						
2.18	Carries out systematic neonatal physical examination before discharge						
2.19	Carries out systematic physical examinations for the mother before discharge						
2.20	Provides perineal care for unable and critically ill clients						
2.21	Cleans, sterilizes and returns all equipment back after use						
2.22	Cleans and keeps in order the delivery unit in order at the end of the procedure						
2.23	Eager to learn (asks questions, answers when asked)						
2.24	Admits his own error						
2.25	Participates actively in group discussion and seminar presentations						
2.26	Shows concern, sympathy and respect when giving nursing for the clients						
2.27	Self-initiation for work and capacity to initiate others						
<b>III</b>	<b>NURSING CARE PLAN</b>						
3.1	Nursing assessment						
3.2	Formulation of nursing diagnosis						
3.3	Setting of patient's goal						
3.4	Nursing intervention						
3.5	Evaluation						
<b>IV</b>	<b>POSTNATAL HEALTH EDUCATION</b>						
4.1	Organization						
4.2	Comprehensiveness						
4.3	Use of relevant references						
4.4	Feedback and summary						
<b>V</b>	<b>SEMINAR AND CASE PRESENTATION</b>						
5.1	Identification of patient's problem						
5.2	Organization						
5.3	Use of references						

5 = Excellent 4 = V. good



- 3 = Good
- 2 = Fair
- 1 = Poor

**EVALUATORS:**

1) Instructor \_\_\_\_\_ Sign \_\_\_\_\_ Date \_\_\_\_\_

**References**

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4. Managing Newborn Problems: A Guide for Doctors, Nurses, and Midwives. WHO: Geneva, 2003
5. World Health Organization (WHO). 2004. Prevention of Mother-to-Child Transmission of HIV. Generic Training Package. In collaboration with the U.S. Department of Health and Human Services, Centers for Disease Control (CDC) and Global AIDS Program (GAP). WHO: Geneva.
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12. Family Planning – A Global Handbook for Providers, 2007.
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16. Dewhurst’s Textbook of Obstetrics & Gynecology, Blackwell Publishers Seventh Ediction, 2007
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# PEDIATRICS AND CHILD HEALTH NURSING

Module Name: Pediatrics and Child Health Nursing

Module Code: NursM-3033

Module Status: Core Module ECTS: 13

## Module Summary

Total Duration=8weeks (including exam)	Weeks/h rs	Emphasis	ECTS
Class Room Based Teaching	3 weeks		
PBL	12hrs		
SDL	18hrs		
Clinical Practice	4 weeks		
Exam Week	1 week		
<b>Module Content</b>	<b>Hours</b>		
Pediatrics and Child Health Nursing Theory	82 hrs	40 %	10
PBL	12 hrs		
Skill lab	18 hrs		
Clinical Practice Hours	168 hrs	60 %	3
<b>Total Study Hours</b>	<b>280 hrs</b>	<b>100 %</b>	<b>13</b>

**Module Description:** This module is designed based on an integrated and innovative competency-based teaching and learning approach for Comprehensive BSc Nursing students. It will enable them to have an adequate theoretical base of common neonatal and childhood illnesses and essential skills to provide high-quality comprehensive nursing care for well and sick newborns and children.

Module competencies:

❖ Provide comprehensive nursing care and management for newborns and children

▪ This competence describes the ability of generic nurses to assess, diagnose, plan, implement holistic nursing care, and evaluate the progress of newborns and children Sub competencies:

1. Assess, diagnose, plan and manage client problems, and evaluate newborn and childhood outcomes using nursing process as a framework
2. Provide comprehensive child health care
3. Assess and manage children with special needs
4. Manage common emergencies and acute health problems of newborns and children
5. Provide management and follow up for chronic health problems of newborns and children

6. Apply evidence-based practice while giving care for newborns and children **Module Objective**
- By the end of this module, students will be able to manage and provide comprehensive nursing care for newborns and children.

### **Supportive Objectives**

1. Describe historical background of pediatric nursing
2. Analyze child morbidity and mortality in Ethiopia
3. Take history and perform physical examination for all pediatric age groups.
4. Perform emergency assessment and management for all pediatric age groups.
5. Monitor Growth and Developmental Stages
6. Provide new born care
7. Describe feeding options for neonates and children
8. Perform neonatal resuscitation
9. Manage common neonatal and childhood illnesses
10. Provide immunization
11. Provide care for children with disability (physically, mentally, and socially)
12. Manage newborn and childhood illnesses using National Guidelines
13. Provide palliative care for children with life-limiting illnesses
14. Manage Pediatric Tuberculosis and HIV

### **Teaching and learning methods**

1. Interactive lecture and discussion
2. Small group discussion
3. Role play
4. Case study
5. Bedside teaching
6. Self-study
7. Portfolio
8. Clinical simulation
9. Video show
10. Demonstration
11. Seminar presentation
12. Guided clinical practice (Hospital Visit)

13. PBL cases Methods of assessment Formative

**Methods of Assessment Formative**

- Drills, essay exams, quizzes
- Workplace based assessments) choose the appropriate method from the listed ones
  - ✓ Mini-Clinical Evaluation Exercise (mini-CEX)
  - ✓ Clinical Encounter Cards (CEC)
  - ✓ Clinical Work Sampling (CWS)
  - ✓ Blinded Patient Encounters (BPE)
  - ✓ Case-based Discussion (CbD)
  - ✓ MultiSource Feedback (MSF)
  - ✓ Direct Observation of Procedural Skills (DOPS)
- Oral exam
- PBL case
- Logbook and Portfolio

**Summative Assessment**

1. Class room-based teaching =40% ○ Written test =25% ○ PBL=5% ○ SDL =10% ○ Total = 40%

2. Clinical practice = 60 %

- DOP= 20 %
- Review of portfolio= 10%
- OSPE with oral =20%
- Other student performance (seminar, CBD, care plan etc..)=10%
- Total =60% Module schedule
- Lecture and discussion + PBL + SDL = 32 hrs/week for 3 weeks
- Clinical practice= 40 hr/week for 4 weeks

Week	Content	Teaching Method	Contact Hrs
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<b>Week-1</b>	<b>Introduction to Pediatrics(2hr)</b> <ul style="list-style-type: none"> <li>➤ Definition of terms</li> <li>➤ History of Neonatal and Pediatric Nursing</li> <li>➤ Neonatal and Child Morbidity and Mortality in Ethiopia</li> <li>➤ Role of Nurses in Neonatal and Child Health</li> </ul> <b>Pediatrics Health Assessment(3hrs)</b> <ul style="list-style-type: none"> <li>➤ Newborn assessment</li> <li>➤ Essential Newborn Care</li> <li>➤ Pediatric Assessment</li> </ul>	<b>Interactive lecture and Discussion</b>	40hrs./wk
	<b>Pediatrics emergency (2hrs)</b> <ul style="list-style-type: none"> <li>➤ Emergency Triage Assessment and Treatment (ETAT)principles</li> </ul>		
	<input type="checkbox"/> <b>Neonatology</b>  <b>Growth and Development(3hrs)</b> <ul style="list-style-type: none"> <li>➤ Growth and Developmental Millstones</li> <li>➤ Principles of Growth and Development</li> <li>➤ Factors Affecting Growth and Development</li> <li>➤ Anticipatory Guidance</li> </ul> <b>Classification of newborn and Childhood nutrition (5hrs)</b> <ul style="list-style-type: none"> <li>➤ classification</li> </ul> <b>Newborn and child feeding</b> <ul style="list-style-type: none"> <li>➤ Newborn,Infantandyoungchildfeeding(exclusivebreastfeeding,Complementary feeding,Formula Feeding)</li> <li>➤ Position and Attachment</li> </ul> <b>Child Nutrition</b> <ul style="list-style-type: none"> <li>➤ Nutritional Assessment</li> <li>➤ Malnutrition</li> </ul>	<b>Interactive lecture and Discussion</b>	
	<b>Common neonatal disorders(6hrs)</b> <ul style="list-style-type: none"> <li>➤ Birth Asphyxia</li> <li>➤ HMD(Respiratory Distress Syndrome)</li> <li>➤ Meconium Aspiration Syndrome</li> <li>➤ Jaundice</li> </ul>		<b>Interactive lecture and Discussion</b>

	<ul style="list-style-type: none"> <li>➤ Sepsis</li> <li>➤ Neonatal meningitis</li> <li>➤ Necrotizing Enterocolitis</li> <li>➤ Hypothermia ➤ Hypoglycemia</li> </ul> <p><b>HEENT disorders(6hrs)</b>  Definition,etiology,riskfactor,pathophysiologyclassification,clinicalmanifestation,differentialdiagnosis,actualandpotentialnursingdiagnosis,investigation, complication and nursing and medical treatment of HEENT <b>Head:</b></p> <ul style="list-style-type: none"> <li>➤ Headache</li> <li>➤ Head Injury <b>Eye disorders</b></li> <li>➤ Conjunctivitis</li> <li>➤ Pediatrics cataract</li> <li>➤ Eye injury</li> <li>➤ Glaucoma</li> </ul> <p><b>Ear disorders</b></p> <ul style="list-style-type: none"> <li>➤ Hearing loss</li> <li>➤ Otitis externa</li> <li>➤ Foreign body</li> <li>➤ Ear infection (acute &amp;chronic otitismedia....)</li> <li>➤ Mastoiditis</li> </ul> <p><b>Nose disorders</b></p> <ul style="list-style-type: none"> <li>➤ Choanalatresia</li> <li>➤ Epistaxis</li> </ul>		
	<p><b>Endocrine Disorders(3hrs)</b>  Definition,etiology,riskfactor,Pathophysiology,Classification,Clinicalmanifestation,diagnosis,investigation,complication,nursingand medicalmanagements</p> <ul style="list-style-type: none"> <li>➤ DM</li> <li>➤ Hyperthyroidism and hypothyroidism</li> </ul>	<p><b>Interactive lecture and Discussion</b></p>	
	<p><b>Skill lab(6hrs)</b></p> <ul style="list-style-type: none"> <li>➤ Neonatal Resuscitation</li> <li>➤ Oxygen Administration</li> <li>➤ Pulse Oxymeter</li> <li>➤ Audiometer</li> <li>➤ Oto-scope</li> <li>➤ Baby bath, TTC, VitK,Chlorahexadine</li> <li>➤ ETAT</li> <li>➤ KMC</li> <li>➤ Growth Chart</li> </ul>		

	➤ Position and Attachment		
	➤ Formula Feeding Preparation		
	<b>PBL (4 hours)</b>		
<b>Week2</b>	<p><b>Birth Injures(2hrs)</b></p> <ul style="list-style-type: none"> <li>➤ Caput Succedaneum</li> <li>➤ Cephalo-hematoma</li> <li>➤ Subgaleal Hemorrhage</li> <li>➤ Brachia IPalsy</li> <li>➤ Phrenic Nerve Paralysis</li> </ul> <p><b>Congenital Disorders(4hrs)</b>  Definition,etiology,riskfactor,pathophysiolo  gyclassification,clinicalmanifestation,differ  entialdiagnosis,actualandpotentialnursingdi  agnosis,investigation, complication and  nursing and medical treatmentof  the following disorders</p> <ul style="list-style-type: none"> <li>➤ Trachea-esophageal fistula</li> <li>➤ Cleft palate/lip</li> <li>➤ Gastro-intestinal anomalous(omphalocele, Gastro-eschesis)</li> <li>➤ Genito-urinary anomalies(Bladder Extrophy)</li> <li>➤ Rectal anomalies (Imperforated anus)</li> <li>➤ Musculo-skeletal anomalies(Clubfoot, Hipbonedisplasia)</li> <li>➤ Genital anomalies (phimosis, paraphimosis, criptiorchidism)</li> <li>➤ Neural tube defects</li> </ul>	<b>Interactive lecture and Discussion</b>	40hrs./wk

	<p><b>Respiratory system disorders (8hrs)</b>  Definition, etiology, risk factor, pathophysiology  classification,clinicalmanifestation,different ialdiagnosis,actualandpotentialdiagnosis,investigation, complication and nursing and medical treatment of the following disorders</p> <ul style="list-style-type: none"> <li>➤ Common cold</li> <li>➤ Croup</li> <li>➤ Bronchitis</li> <li>➤ Pneumonia</li> <li>➤ Sinusitis</li> <li>➤ Pharyngitis</li> <li>➤ Tonsillitis</li> <li>➤ Tuberculosis</li> <li>➤ Epiglottis</li> <li>➤ Empyema</li> </ul>	<p><b>Interactive lecture and Discussion</b></p>	
	<ul style="list-style-type: none"> <li>➤ Emphysema</li> <li>➤ Childhood asthma</li> <li>➤ Foreign body aspiration</li> <li>➤ Chocking</li> </ul>		
	<p><b>Musculoskeletal Disorders(4hrs)</b>  Definition,etiology,riskfactor,Pathophysiology,Classification,Clinicalmanifestation,diagnosis,investigation,complication,nursingand medicalmanagements</p> <ul style="list-style-type: none"> <li>➤ Osteomyelitis</li> <li>➤ Arthritis</li> <li>➤ Fracture</li> <li>➤ Dislocation</li> <li>➤ Strain</li> <li>➤ Sprain</li> <li>➤ Pyomyocitis</li> </ul>		
	<p><b>Pediatric oncology and HIV(4hrs)</b>  Definition,etiology,riskfactor,Pathophysiology,Classification,Clinicalmanifestation,diagnosis,investigation,complication,nursingand medicalmanagements</p> <ul style="list-style-type: none"> <li>➤ Oncology (Lukemia, Wilms Tumor Burkitt lymphoma, Bone cancer, retinoblastoma, Neoplasm of the Larynx, Trachea and others .....)</li> <li>➤ Pediatric HIV</li> <li>➤ Palliative Care</li> </ul>	<p><b>Interactive lecture and Discussion</b></p>	



	<p><b>Congenital heart disease(2hrs)</b>  Definition,etiology,riskfactor,pathophysiolo  gyclassification,clinicalmanifestation,differ  entialdiagnosis,actualandpotentialdiagnosis,  investigation, complication and nursing and  medical treatment of the following disorders</p> <ul style="list-style-type: none"> <li>➤ Congenitalheartdisease(VSD,ASD,PD  A,Coarctationofaorta,TOF,PVS,AVS,T  ranspositionofgreatarteries,Truncusarter  iosus,Single ventricle)</li> </ul> <p><b>Cardio vascular disorders(4hrs)</b>  Definition,etiology,riskfactor,pathophysiolo  gyclassification,clinicalmanifestation,differ  entialdiagnosis,actualandpotentialdiagnosis,  investigation, complication and nursing and  medical treatment of the following disorders</p> <ul style="list-style-type: none"> <li>➤ Acute rheumatic fever and  rheumatic heart disease</li> </ul>	<p><b>Interactive lecture  and  Discussion</b></p>	
	<ul style="list-style-type: none"> <li>➤ Infective endo-carditis</li> <li>➤ Heart failure</li> <li>➤ Cardiomyopathy</li> <li>➤ Angina pectoris</li> <li>➤ Shock</li> </ul> <p><b>Hematologic disorders(2hour)</b>  Definition,etiology,riskfactor,pathophysiolo  gyclassification,clinicalmanifestation,differ  entialdiagnosis,actualandpotentialdiagnosis,  investigation, complication and nursing and  medical treatmentof the following disorders</p> <ul style="list-style-type: none"> <li>➤ Anemia</li> <li>➤ Polycythemia</li> <li>➤ Hemophilia</li> </ul>		
	<p><b>Skill Lab(6hrs)</b></p> <ul style="list-style-type: none"> <li>➤ Demonstrating cardio-vascularP/E</li> <li>➤ ECG/EKG, and Echocardiography</li> <li>➤ Nebulizer</li> <li>➤ Postural drainage</li> <li>➤ Thoracentesis</li> <li>➤ Water–seal drainage</li> <li>➤ Shock Position</li> <li>➤ Care of a child with traction</li> <li>➤ Care of a child with amputation</li> </ul>		

	<b>PBL(4 hrs)</b>		
<b>Week 3</b>	<p><b>Common Genetic Disorders(2hr)</b></p> <ul style="list-style-type: none"> <li>➤ Down syndrome</li> <li>➤ Autism</li> </ul> <p><b>Gastrointestinal disorders (8hrs)</b>  Definition,etiology,riskfactor,pathophysiolo  gy,Classification,Clinicalmanifestation,diag  nosis,investigation,complication,nursingand  medicalmanagements</p> <ul style="list-style-type: none"> <li>➤ Disorders of the oropharynx(E.g. Oral and Esophageal Lesions)</li> <li>➤ Esophageal disorders (esophageal</li> <li>➤ Abdominal trauma</li> <li>➤ Peritonitis</li> <li>➤ Appendicitis</li> <li>➤ Gastro esophageal reflex</li> <li>➤ Diarrheal diseases</li> <li>➤ Gastritis</li> <li>➤ Intestinal parasitosis</li> <li>➤ Hepato-bilary disorders</li> <li>➤ Pancreatitis</li> <li>➤ Hepatitis</li> </ul>	<b>Interactive lecture and Discussion</b>	40 hrs./week
	<ul style="list-style-type: none"> <li>➤ Hirschsprung Diseases</li> <li>➤ Intussusception</li> <li>➤ Pyloricstenosis</li> <li>➤ Hernia(hiatal ,inguinal, Femoral, Umbilical ,Incisional)</li> </ul> <p><b>Renal Disorders(4hrs)</b>  Definitions, etiology, risk factors,  Pathophysiology,  Clinical manifestations, Diagnosis ,investigation  and nursing &amp;medical treatment</p> <ul style="list-style-type: none"> <li>➤ Nephrotic Syndrome</li> <li>➤ Renal Failure/Acute Kidney injury</li> <li>➤ Urinary Tract Infection(UTI)</li> <li>➤ Glomerulonephritis</li> </ul>		

	<p><b>Neurologic disorders(3hrs)</b>  Definition,etiology,riskfactor,pathophysiologyclassification,clinicalmanifestation,differentialdiagnosis,actualandpotentialdiagnosis,investigation, complication and nursing and medical treatmentof the following disorders</p> <ul style="list-style-type: none"> <li>➤ Epilepsy/Seizure</li> <li>➤ Meningitis</li> </ul>	<b>Interactive lecture And Discussion</b>	
	<p><b>Integumentary(6hrs)</b>  Definition,etiology,riskfactor,Pathophysiolog,Classification,Clinicalmanifestation,diagnosis,investigation,complication,nursingand medicalmanagements</p> <ul style="list-style-type: none"> <li>➤ Skinlesions</li> <li>➤ Acne, Warts &amp;Scabies</li> <li>➤ Atopic dermatitis/eczema</li> <li>➤ Impetigo</li> <li>➤ Cellulitis</li> <li>➤ Folliculitis ➤ Carbuncle</li> <li>➤ Furuncle</li> <li>➤ Fungal Infections of the Skin (Onychomycosis,Dermatophytosis,Tineacorporis,Tineacapitis,Tineacuris&amp;Tineapedis)</li> <li>➤ Burn</li> </ul>	<b>Lecture and Discussion</b>	
	<p><b>IMNCI and EPI (7hrs)</b></p> <ul style="list-style-type: none"> <li>➤ Integrated Management New born and Childhood Illnesses</li> <li>➤ EPI</li> <li>➤ Vaccine Preventable Disease</li> </ul>		
	<p><b>Skill Lab (6hrs)</b></p> <ul style="list-style-type: none"> <li>➤ Pediatric Catheterization</li> <li>➤ Care of comatose child</li> <li>➤ IV Secure and Fluid Administration</li> <li>➤ Gastrostomy feeding</li> <li>➤ Enema</li> <li>➤ Cold Chain Management</li> </ul> <p>Vaccine preparation and administration</p>	<p>Video teaching  Demonstration  Teaching and  Roll play</p>	
	<b>PBL(4 hrs)</b>		
<b>Week 4-7</b>	<b>Hospital practice</b>		

	<ul style="list-style-type: none"> <li>➤ Manage Common Neonatal and childhood problems</li> <li>➤ Perform Essential new born care</li> <li>➤ Perform New born assessment</li> <li>➤ Perform Neonatal Resuscitation</li> <li>➤ Counsel optimal Nutrition</li> <li>➤ Evaluate Nutritional Status</li> <li>➤ Manage malnutrition</li> <li>➤ Demonstrate proper attachment and position on Breast feeding</li> <li>➤ Demonstrate KMC</li> <li>➤ Operate Radiant warmer, Phototherapy, Incubator</li> <li>➤ Perform NG tube insertion, Cup feeding</li> <li>➤ Measure Vital Sign</li> <li>➤ Use Pulse oxymeter for monitoring patient progress</li> <li>➤ Apply hot and cold compression</li> <li>➤ Administer Oxygen</li> <li>➤ Perform CPAP</li> <li>➤ Prepare IV maintenance fluid</li> <li>➤ Assist Exchange Blood transfusion</li> <li>➤ Collect Blood sample</li> <li>➤ Perform Catheterization</li> <li>➤ Assist endotracheal intubation</li> <li>➤ Evaluate Sick child who needs Emergency management</li> <li>➤ Perform Ear irrigation and Eye irrigation</li> <li>➤ Execute Postural drainage, Thoracentesis and Water –seal drainage</li> <li>➤ Assist Tracheotomy care</li> <li>➤ Perform CPR</li> <li>➤ Assist Removing foreign body form eye, ear &amp; nose Perform wound care</li> <li>➤ Manage burned Child</li> </ul>		
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	<ul style="list-style-type: none"> <li>➤ Applying comfortable device</li> <li>➤ Provide care for a child with cast and traction</li> <li>➤ Assist Lumbar puncture</li> <li>➤ Administer Medication</li> <li>➤ Perform diagnostic and therapeutic gastric aspiration Apply enema</li> <li>➤ Apply colostomy care</li> <li>➤ Prepare fluids with different concentration ➤ Administer fluids for dehydrated patients</li> <li>➤ Assist Pre-cutaneous urine aspiration Assist Male circumcision</li> <li>➤ Monitor Growth and Development</li> <li>➤ Recording and reporting patient findings</li> <li>➤ Apply infection prevention</li> <li>➤ Provide care for a child with HIV/AIDS</li> <li>➤ Administer vaccination</li> <li>➤ Develop nursing care plan for common neonatal and childhood disorders</li> <li>➤ Perform Pediatric life support</li> <li>➤ Apply IMNCI</li> <li>➤ Carry out admission and discharge documentation</li> </ul>		
<b>Week 8</b>	<b>Final Exam and OSCE</b>		

## References

1. Nelson text book of pediatrics, 19<sup>th</sup> edition
2. Marlow, Dorothy, Textbook of pediatric Nursing, W.B. Saunders co. Philadelphia,London.
3. Whale and Wong, essentials of pediatric Nursing, The C.V Mosby Co. st Louis
4. Leiffer, Gloria, principles and Techniques in pediatric nursing W>B> Saunders Co.
  - a. IMNCI Modules, 2015
5. Guidelines for pediatric HIV/AIDS care and treatment in Ethiopia, MOH 2007.
6. Wong's 9<sup>th</sup> edition, Essentials of pediatric nursing
7. Theresa Kyle 2<sup>nd</sup> edition., Essentials of pediatric nursing,
8. Lecture note, Pediatric nursing and health care, EPHTI, Jimma University
9. Patricia M. Dillon, Nursing health assessment, a critical thinking case studies approach
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# NURSING EDUCATION AND CURRICULUM DEVELOPMENT

**Module title: Nursing Education and Curriculum Development Module code: Nurs 3042 ECTS: 3**

**Lecture hour = 34 Practice: 8 hours**

**Module description:** This module is structured to introduce the learner to basic concepts, principles and methods of the teaching and learning process. It will also introduce the learners to the process of the design, implementation and evaluation of a course. The module provide an overview of curriculum philosophy, models, and evaluation activities. Module activities will focus on preparation of lesson plans appropriate to each domain of learning and to the characteristics of the learner.

## **Module Competence:**

- Understand the major components of a curriculum
- Prepare a session/lesson plan
- Conduct a learning teaching session using different teaching methods
- Facilitate a discussion effectively
- Apply curriculum principles in nursing education

**Module objective:** At the end of this module, the students will be able to effectively design, develop, facilitate and monitor teaching - learning experience in nursing professions

## **Learning outcomes**

1. Analyze the different theories of learning and its implication in teaching learning process
2. Analyze the different educational philosophies and their implication in curriculum design
3. Identify effective teaching –learning approach in the perspective of the different educational philosophies and learning theories
4. Identify challenges in nursing professional educations and provide suggestion for improvement
5. Evaluate the content and the different components of existing nursing curriculum and provide suggestion for improvement
6. Effectively plan for facilitating teaching in various settings
7. Facilitate learning using a variety of learning methods and activities
8. Assess the progress of learning and making judgment to increase student's learning and development
9. Conduct educational quality assessment using standards
10. Identify performance gaps, analyze the cause of performance gaps and select appropriate intervention to fix the existing gaps /problem **Teaching –learning methods and activities**
  - Interactive lecture
  - Demonstration
  - Guided practice

- Facilitated group discussion
- Project work
- Peer learning

**Learning assessment methods**

- Direct observation of performance
- Written test (MCQ, Essay, ...)
- Review of task (project, assignment, report,) completed by students
- Oral questioning □ Peer assessment Assessment
- Written exam (50 %)
- Assignment and presentation (20%)
- Project (30 %)

Module schedule

Week	Contents	Time
1-3	Introduction to education The meaning and scope of education Types Functions of education	2 hrs./wk
	Aims of education Principles of teaching and learning Purpose of teaching Teaching approaches Challenges of health professional educations	
4-5	<b>Instructional objectives</b> Definition General objectives Intermediate objectives Criteria used for writing Specific objectives Domains of objectives Levels of objectives	2 hrs./wk



6-8	<b>Common methods of teaching</b> Lecture method The Demonstration method Role play Various types of discussion methods Definition of a lesson plan Values of a lesson plan Essential components of a lesson plan Development of a lesson plan	2 hrs./wk
9-11	Basic techniques of teaching/learning Definition and classifications of instructional media Advantages Factors affecting the selection of media Flip charts, Wall charts and posters Electronic medias including use of computers and LCD Advantage, disadvantage and techniques of each media	2 hrs./wk
12-14	Curriculum Philosophical and historical aspects of nursing practice and education Conceptual framework Conceptions of a curriculum Planning a curriculum using an objective model	2 hrs./wk
15-17	Curriculum evaluation Purposes Types of curriculum evaluation Models of curriculum evaluation Curriculum Change Definition Curriculum change and its nature Resistance to change Curriculum Implementation Situational Analysis Prerequisite, Nomenclature of the course, code number, credit, placement Writing course description, goal and objectives Graduate profile Course contents Methodology Assessments References	2 hrs./wk
18	Curriculum evaluation project/ lesson plan preparation /Present using selected methods of teaching	8 hrs./wk

19	Final Exam	
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*\*\*\*N.B its stated on the course catalogue that nursing education and curriculum development will be delivered in block modalities however the above schedule was done for parallel mode of delivery, hence institutions can customize and amend as applicable (either block or parallel)*

## Reference

1. Guilbert JJ. (1998). Educational Handbook for Health Professionals, WHO, Jeneva.
2. Matiru, B., G. Schlette, R. (1995). Teach Your Best. A handbook for University Lecturers, Geramn, Deutche Stifung for Internationale, Entwicklung, (DSE)
3. Davis, B.G. (2009). Tools for Teaching. 2 nd Edition, San Francisco: Jossey Bass.
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5. Science Students, Lecture note Series, EPHTI, Carter Center.
6. Barbara Ann Mayor, Ruth A. Whitman- Price (2008): Nursing education: foundation for practice

# MENTAL HEALTH NURSING

Module title: Mental Health Nursing

Module Code: NursM-3053

EtCTS. = 8

**Prerequisite:** Foundation I, II , MSN I, II theory and practice

## Module summary

- Duration 4 weeks
- Total classroom-based teaching hrs. (Lecture, SDL, PBL.) = 2 weeks (85hr)
- Exam =1 week
- Clinical practice = 40hr/week **Module Description:**

This module is designed to prepare nursing students to assess, diagnose, plan and manage common psychiatric disorders. The module is also intended to help the students in understanding human behavior and differentiating between normal and abnormal behavior. It also will help students to develop skills in therapeutic communication and developing a nurse-patient relationship to manage, support, and rehabilitate patients with mental illness in hospitals and communities.

**Module competency:** After the end of this module nursing students will be able to;

- ❖ Conduct complete mental health assessment and apply DSM-5 common mental health problems.
- ❖ Provide mental health services at institutional and community settings.

**Module objective:** After completion of this module the students will be able to assess, diagnose, and manage common mental health problems based on DSM-5 and the nursing process as a framework.

## Supportive Objectives:

At the end of this module the students will be able to: Specific: At the end of this module the students will be able to:

- ❖ Differentiate mental health, mental illness, and common psychiatric disorders
- ❖ Identify the general principles of psychiatry interview
- ❖ Perform mental health nursing assessment (history taking and MSE)
- ❖ Demonstrate skills in therapeutic communications
- ❖ Describe etiological factors, psychopathology, clinical features, diagnostic criteria and treatment modalities used for mental disorders
- ❖ Differentiate psychiatric disorders
- ❖ Apply the Diagnostic and Statistical Manual of Mental Disorders (DSM-5)
- ❖ Manage common psychiatric disorders
- ❖ Refer cases that require further investigation and treatment

- ❖ Apply psychiatry case formulation by using Biopsychosocial model
- ❖ Manage patients with psychiatric emergencies
- ❖ Apply the preventive, curative, and promote methods of mental health including rehabilitative care

### **Teaching –learning assessment methods**

#### **Formative assessment**

- Quiz
- Assignment
- Seminar
- Observation with a checklist
- Logbook
- Dairy writing
- Nursing care plan
- Feedback on reflective portfolio

#### **Summative assessment of the overall module**

##### **1. Class room-based teaching =40%**

Written test = 33%

PBL = 5%

SDL = 2%

Total = 40%

##### **2. Clinical and community practice = 60%**

DOP = 24%

Review of portfolio = 12%

OSCE with oral =18%

Other student performance (seminar, CBD etc.) = 6 % Total =60% Module schedule

Course Schedule	Day	Topics	Contact Hours
1st Week		<p><b>Introduction to mental health Nursing (2Hrs)</b></p> <ul style="list-style-type: none"> <li>❖ Definition of psychiatry, mental health nursing, mental health, mental illness, and mental disorders</li> <li>❖ Historical development of psychiatry</li> <li>❖ Global and national burden of mental illness</li> <li>❖ Etiology of mental illnesses</li> <li>❖ Factors influencing mental health</li> <li>❖ Characteristics of people with mental health and mental illnesses</li> <li>❖ Common misconception about mental illnesses</li> </ul> <p><b>Psychopathology (4Hrs)</b></p> <ul style="list-style-type: none"> <li>❖ Define signs, symptoms, and syndrome</li> <li>❖ Perceptual disturbance</li> <li>❖ Thought and speech disturbance</li> <li>❖ Motor disturbance</li> <li>❖ Emotional disturbance (mood and affect)</li> </ul> <p><b>Examination and diagnosis of the psychiatric patients (4Hrs)</b></p> <ul style="list-style-type: none"> <li>❖ Psychiatry history taking</li> <li>❖ Mental status examination (MSE)</li> </ul> <p><b>Therapeutic communication (1Hrs)</b></p> <ul style="list-style-type: none"> <li>❖ Definitions and types</li> <li>❖ Process and techniques of communication</li> <li>❖ Process and techniques of communication</li> <li>❖ Nurse-patient- relationship</li> </ul>	

2nd week		<p><b>Classifications of mental disorders based on Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR).</b></p> <p><b>1. Schizophrenia spectrum and other psychotic disorders (8Hrs)</b></p> <ul style="list-style-type: none"> <li>❖ Introduction to psychoses</li> <li>❖ Schizophrenia</li> <li>❖ Schizophreniform disorder</li> <li>❖ Brief psychotic disorder</li> <li>❖ Schizoaffective disorder</li> <li>❖ Delusional disorder</li> <li>❖ Psychotic disorders secondary to Another Medical Conditions (AMC) and/or substance use and/or medications</li> <li>❖ Management of patients with psychotic disorders</li> <li>❖ Nursing intervention for patients with psychotic disorders</li> </ul> <p><b>2. Mood disorders (8Hrs)</b></p> <ul style="list-style-type: none"> <li>✦ <b>Introduction to mood disorders</b> <ul style="list-style-type: none"> <li>❖ <b>Bipolar and related disorders</b> <ul style="list-style-type: none"> <li>❖ Bipolar I Disorder</li> <li>❖ Bipolar II Disorder</li> <li>❖ Cyclothymic Disorder</li> </ul> </li> <li>✦ Bipolar and related disorders secondary to Another Medical Conditions (AMC) and/or substance use and/or medications           <ul style="list-style-type: none"> <li>❖ <b>Depressive disorders</b> <ul style="list-style-type: none"> <li>▪ Major depressive disorder (MDD)</li> </ul> </li> <li>▪ Persistent depressive disorder (Dysthymia)</li> <li>▪ Depressive disorders secondary to Another Medical Conditions (AMC) and/or substance use and/or medications               <ul style="list-style-type: none"> <li>• Treatment of mood disorders</li> <li>• Nursing intervention for patients with mood disorders</li> </ul> </li> </ul> </li> </ul> </li> </ul>	
	✦ <b>SDL (4Hrs)</b>	<ul style="list-style-type: none"> <li>• Examination and diagnosis of the psychiatric patients</li> </ul>	

✦ **PBL- Premenstrual dysphoric disorder (PMDD) (4Hrs)**

**3. Anxiety disorder (6Hrs)**

- ✦ Introduction to anxiety disorder
- ✦ Generalized anxiety disorder (GAD)
- ✦ Phobias
- ✦ Social anxiety disorder (Social phobia)
- ✦ Specific phobia
- ✦ Panic disorder
- ✦ Agoraphobia
- ✦ Anxiety disorders secondary to Another Medical Conditions (AMC) and/or substance use and/or medications
- ✦ Treatment of anxiety disorders
- ✦ Nursing intervention for patients with anxiety disorders

**4. Obsessive-compulsive and related disorders (OCD) (2Hrs)**

- ❖ OCD
- ❖ Management of patients with OCD
- ❖ Nursing intervention for patients with OCD

**5. Traumatic and stressor-related disorders (4Hrs)**

- ✦ Post-traumatic stress disorder (PTSD)
- ✦ Acute stress disorder (ASD)
- ✦ Management of patients with traumatic and stressor-related disorders
- ✦ Nursing intervention for patients with traumatic and stressor-related disorders

**6. Neurocognitive disorders (NCD) (6Hrs)**

- ✦ Delirium
- ✦ Dementia
- ✦ Amnestic disorders
- ✦ Neurocognitive disorders secondary to Another Medical Conditions (AMC) and/or substance use and/or medications
- ✦ Management of patients with Neurocognitive disorders
- ✦ Nursing intervention for patients with Neurocognitive disorders

		<b>7. Minor psychiatric disorders (8Hrs)</b>	
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|--|--|---|--|
|  |  | <ul style="list-style-type: none"><li>✦ Somatic Symptom and Related Disorders</li></ul> |  |
|--|--|---|--|



	<ul style="list-style-type: none"> <li>✦ Personality disorders</li> <li>✦ Sexual dysfunction and paraphilia disorder</li> <li>✦ Sleep-wake disorders</li> <li>✦ Feeding and eating disorders</li> <li>✦ Elimination disorders</li> <li>✦ Management of patients with neurocognitive disorders</li> <li>✦ Nursing intervention for patients with neurocognitive disorders</li> </ul> <p><b>8. Substance-related and addictive disorders (6Hrs) ❖</b></p> <p>Substance-related disorders</p> <ul style="list-style-type: none"> <li>❖ Alcohol-related disorders</li> <li>❖ Tobacco-related disorders</li> <li>❖ Khat-related disorders</li> <li>❖ Cannabis-related disorders</li> </ul> <ul style="list-style-type: none"> <li>❖ Management of patients with substance-related and addictive disorders</li> <li>❖ Nursing intervention for patients with substance-related and addictive disorders</li> </ul> <p><b>9. Emergency psychiatry (8Hrs)</b></p> <ul style="list-style-type: none"> <li>✦ Suicide</li> <li>✦ Violence</li> </ul> <ul style="list-style-type: none"> <li>❖ Medication-induced movement disorders and other adverse effects of medications <ul style="list-style-type: none"> <li>❖ Acute dystonia</li> <li>❖ Neuroleptic malignant syndrome (NMS)</li> <li>❖ Tardive dyskinesia</li> <li>❖ Akathisia</li> <li>❖ Pseudo parkinsonism</li> </ul> </li> <li>❖ Postpartum psychiatric disorders (psychosis and depression)</li> <li>❖ Management of patients with psychiatry emergencies</li> <li>❖ Nursing intervention for patients with psychiatry emergencies</li> </ul> <p><b>PBL - Medication-induced movement disorders (4Hr)</b></p> <p><b>10. Child psychiatry (6Hrs)</b></p>	
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		<ul style="list-style-type: none"> <li>✦ Neurodevelopmental disorders <ul style="list-style-type: none"> <li>❖ Autism</li> <li>❖ Down syndrome</li> <li>❖ Intellectual disability</li> <li>❖ Management of patients with neurodevelopmental disorders</li> <li>❖ Nursing intervention for patients with neurodevelopmental disorders</li> </ul> </li> </ul>	
<b>3rd week</b>	<b>Area</b>	<b>Hospital practice (40Hrs)</b>	
	(OPD & WARD)	<ul style="list-style-type: none"> <li>❖ Differentiate common psychiatric disorder</li> <li>❖ Perform psychiatry nursing history taking</li> <li>❖ Perform mental state examination (MSE)</li> <li>❖ Apply nursing intervention for patient with schizophrenia spectrum and other psychotic disorders and mood disorders</li> <li>❖ Apply nursing intervention for patients with anxiety disorder</li> <li>❖ Apply nursing intervention for patient with substance related disorder</li> <li>❖ Observation of E.C.T. (Electroconvulsive therapy)</li> </ul>	
<b>4th week</b>		<b>Final Exam</b>	

### References;

1. Mary C. Townsend, Psychiatric nursing: assessment, care plans, and medications. 9<sup>th</sup> ed, 2015.
2. Senthil Tihrusangu Psychiatric Mental Health Nursing, 2<sup>nd</sup> edition, 2018
3. Videbeck, Sheila L. Psychiatric-mental health nursing. 5<sup>th</sup> ed, 2012.
4. Managing the side effects of psychotropic medications. American Psychiatric Pub; 2018 Aug 10, 2<sup>nd</sup> edition.
5. Ed. Stephen Jones, Stephen Jones, et al. 100 cases in psychiatry Oct 19, 2017, 1<sup>st</sup> edition.
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15. Galanter CA, Jensen PS, editors. DSM-5® Casebook and Treatment Guide for Child Mental Health. American Psychiatric Pub; 2016 Jun 21.
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19. Community mental health. Routledge; 2013 Nov 5.
20. Chiles JA, Roberts LW. Clinical manual for assessment and treatment of suicidal patients. American Psychiatric Pub; 2018 Aug 23.
21. Ketter TA, editor. Advances in treatment of bipolar disorders. American Psychiatric Pub; 2015 Apr 9

# NURSING LEADERSHIP AND MANAGEMENT

Module name Nursing leadership and management

Module Code: SPH 3073

ECTS: 7

Duration: 20 Weeks Lecture 78hrs.

Practice: 8hrs.

Module Description: This module is designed to comprehensive nursing students to equip them with the knowledge, skills and needed to lead and manage nursing service administration and leadership. Also provides students a conceptual framework for understanding health informatics and information technology as applied in the healthcare environment.

Module Competence: after completion of these module the learners will have the following competencies

- Utilize basic principles involved in management of resources
- Design an organizational plan and implement at different settings
- Monitor and evaluate health related activities
- Apply basic principles of management and leadership in different health facility levels.
- Apply the basic concept and principles of health informatics in the day-to-day activities □ Record, document and report health related data

Upon the completion of this module, students will be able to:

- Analyze and apply principles and functions of management
- Describe concept of nursing service administration and leadership
- Discusses and analyze the principle of leadership in the health sector
- Apply nursing service administration and leadership principles
- Demonstrate a merit-based selection, appointing, managing and leading the human Resources
- Describe basic principles involved in management of resources.
- Analyze the principle of change and involve in implementation of change
- Plan and perform quality assurance on nursing care service
- Identify the major risk areas in nursing services and manage it
- Lead group dynamics and team spirit
- Analyze and apply advocacy role in nursing care service
- Analysis and resolve conflict within and/or out of organization
- Analyses and apply the discipline measures
- Manage nursing care and service, education, training, and staff development program
- Create motivating working environment to assure quality nursing service
- Effectively manage time and financial resource of an organization
- Utilize organizational communication appropriately
- Design and conduct project on health service of the organization
- Explain and demonstrate managerial role at different organization level

- Identify and discuss the merit and demerit of leadership types
- Apply the attributes and principles of critical thinking in both clinical and leadership areas
- Understand the basics of computer network and Internet
- Explain the basic theoretical concept that underlies informatics practice
- Identify how health data is processed into information and knowledge for health care tasks with the support of information technology to improve patient care
- Understand and practice the concept of Health information system and its characteristics
- Describe the different types of Health information systems (routine and clinical information systems) specific to their disciplines.
- Explain how the use of an electronic health record system can affect patient care safety, efficiency of care practices, and patient outcomes
- Analyze how the integration of data from many sources assists in making clinical decisions and discuss how tele health communication technologies support clinical care.
- Understand and practice the concept of information retrieval techniques

### **Teaching-Learning Methods**

- ✦ Interactive lecture and discussion
- ✦ Small group learning activities: assignment, exercise,
- ✦ Individual reading assignment
- ✦ Group discussion
- ✦ Presentation
- ✦ Group project presentation
  
- ✦ Assessment Methods
  
- ✦ Written exam (50 %)
- ✦ Assignment and presentation (20%)
- ✦ Project (30 %)

Week	Contents	Time
1-2	<p>Introduction to nursing leadership and management</p> <p>Definition of leadership</p> <p>Principles of leadership</p> <p>Types of leadership</p> <p>styles of leadership</p> <p>Application to Nursing profession</p> <p>Concepts and applications of leadership in the health sector</p>	4 hrs/week
3-4	<p>Definition of management</p> <p>Theories of management</p> <p>Types of managers</p> <p>Managerial Skills</p> <p>Management functions and Managerial roles (Planning, Organizing, Implementing, Controlling, Monitoring and evaluation etc.)</p>	4 hrs/week
5-6	<p>Resource management</p> <p>Human resource management</p> <p>Acquisition and Recruitment</p> <p>Selection</p> <p>Induction and orientation</p> <p>Retention</p> <p>Development</p> <p>Discipline,</p> <p>Delegation</p> <p>Performance appraisal, Motivation, promotion and training</p> <p>Financial resource management</p> <p>Concepts of budget in health</p> <p>Types of budgets</p> <p>Approach of budgeting</p>	4 hrs/week
	<p>Time resource management</p> <p>Concept of time management</p> <p>Planning time arrangements (Timetable, Schedule, Roster)</p> <p>Common time waster</p> <p>Principles of time management</p> <p>Materials and equipment management</p>	

7	<p>Group dynamics and teamwork</p> <p>Types of groups  Phases of group development  Managing Group Dynamics  Types and styles of Decision making  Factors Influencing Decision Making  Concept of teamwork and team sprit  Organizational communication</p> <p>Concept of organizational communication  Types of communication  Levels and pattern of communication  Factors influencing organizational communication</p>	4 hrs./week
8-9	<p>Nursing service administration</p> <p>Organizational structure of nursing services  Nursing care delivery models  Nursing round and Patient hand over  Nursing workload calculation  Clinical supervision in nursing services  Role of nurse at different levels of nursing service administration  Nurse advocacy role (concept, principles and rationales)  Quality assurance and risk management of nursing services</p>	4 hrs/week
10	<p>Conflict management</p> <ul style="list-style-type: none"> <li>▪ Definition and concepts</li> <li>▪ Sources of conflict</li> <li>▪ Explain types of conflict</li> <li>▪ Discuss stages of conflict</li> </ul> <p>Explain approaches to conflict resolution</p>	4hrs/week
11	<p>Introduction to planning and implementing change</p> <p>Definition and concepts of change  Purpose of change and areas of change influencing healthcare today Change strategies</p>	4hrs/week

	Rules that should be followed in implementing change Leaders as change agents Change management Reason for change Change process (steps) Methods of problem solving			
Week	Lecture Plan	Hrs.	Practice	Hrs.
12	Health informatics Introduction Application of computer technology in Nursing	2	Know basic computer skill and deal on its application for nursing profession.	4
14	Health informatics terminologies Domains of Health informatics Information hierarchy (Data, Information, Knowledge, Wisdom) Health Information Systems Overview Why health information system Classification of health information system Health information system reform	4	Observing the HMIS system in health facilities	4
15	Routine health information system Introduction Information cycle Data collection/extraction Data processing Data presentation Health data record keeping and documentation Information utilization Data quality Health management information system HMIS in Ethiopia	4	Practice on Microsoft excel Formula table graph Practice on Microsoft power point	4
16	Clinical Information System EMR Patient Monitoring Systems	4	Familiarize with EMR software	4
17	Information retrieval & Overview of Evidence based practice Information and computer ethics	4	Search tools Search engine Google Google scholar	4



	Search tools and search engines	Databases (Pub med, Gate way, HINARI, Pub Med) Evidence based practice	
18-19	Project assignment  Nursing service management and leadership project ✓ Assess the existing health facility through the lenses of the health service administration concept ✓ Make SWOT analysis ✓ Identify the problem and prioritize based on criteria ✓ Set an action plan which includes objectives, strategies, duration of implementation and responsible bodies ✓ Provide summary/conclusion and possible recommendation ✓ Submission of report in paper based and set symposium presentation		8 hrs./week
<b>20</b>	<b>Final exam</b>		

*\*\*\*N.B its stated on the course catalogue that nursing leadership and management will be delivered in block modalities however the above schedule was done for parallel mode of delivery, hence institutions can customize and amend as applicable (either block or parallel)*

## References

1. Amsale Cherie and Brhane G/kidan. Lectur note of Nursing leadership and management, Adis Ababa iniversity, 2005
2. Management Sciences for Health (MSH). Managers who lead. MSH, 2005.
3. Jira C. Health planning for health science students. Carter Center; 2003.
4. Haile Mariam D. Exploring Alternatives for Financing Health Care In Ethiopia: An Introductory Review Article.Ethiop J Health Dev2001;15(3):153-163.
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## **MODULE NAME: RESEARCH METHODOLOGY**

**Code: Nurs4032**

**Module ECTS: 5 / 3 credit hr.**

**Lecture Hours: 75 hours**

**Module Description:** This module is designed for BSc in nursing students to have basic theoretical and practical background in research methodology. This course will enable the students to understand the methodological aspects of research process and operationalize how to write research proposal (Scientific writing), data collection, organization, analysis and interpretation. Furthermore, it gives the students the opportunities to disseminate and utilize research findings.

Module competence: after completion of these module the learners will have the following competencies

- ✦ Identify research problems important to health at community, and health facility level
- ✦ Design and conduct health research for the identified health problem
- ✦ Interpret and utilize findings of health related research

### **Module Objective:**

At the end of this module, learners will be able to describe and apply basic research method to investigate health problems as it applies to nursing to improve quality of care, promote the health status of patients and families.

### **Learning Outcomes:**

To meet the above module objective the student will be expected to:

- ✦ Explain the concept of research and nursing research
- ✦ Describe the different types of research
- ✦ Identify research problems
- ✦ Write literature review text
- ✦ Develop research objectives
- ✦ Distinguish the different types of research designs
- ✦ Select study population
- ✦ Identify different types of sampling methods
- ✦ Outline different types of data collection methods
- ✦ Differentiate different methods of data analysis
- ✦ Analyze ethical issues in research processes
- ✦ Develop a research proposal
- ✦ Point out different ways of referencing
- ✦ Prepare work plan and budget break down
- ✦ Prepare a research report

- ★ Describe how to utilize research findings for evidence based Nursing practices.

### Teaching-Learning Methods

- Interactive lecture and discussion
- Small group learning activities: assignment, exercise, proposal writing
  - Individual reading
  - \○ Project writing
- Use of computer applications and access to the internet
- Student presentation
- Personal reflection exercise

### Assessment Methods Formative assessment

- Exercise and assignment
- Student presentation

### Summative assessment

- Written exam (50 %)
- Assignment and/or student presentation (20 %)
- Research proposal (30%)

### Learning materials

- AV aids (LCD and computer, writing board and marker or chalk)
- Computers with appropriate statistical software like EPI info, SPSS and etc.
- Handouts of lecture materials

Week	Contents	Time
1-2	<b>Introduction to research</b> <ul style="list-style-type: none"> <li>✓ Research and nursing research</li> <li>✓ Importance of research</li> <li>✓ Common research terminologies</li> <li>✓ Types of research Steps in research process</li> </ul>	10 hrs./wk
3-4	<b>Identification and delimitation of research problems</b> <ul style="list-style-type: none"> <li>✓ Research topic selection</li> <li>✓ Identification and prioritization of research problem</li> <li>✓ Writing study background and problem statement</li> </ul>	4hrs./wk

5-8	<b>Literature Review</b> <ul style="list-style-type: none"> <li>✓ Importance of literature review</li> <li>✓ Approaches to literature review (Induction and deduction)</li> <li>✓ Steps in literature review</li> <li>✓ Different ways acknowledging scientific papers referencing</li> <li>✓ Commonly used electronic data bases</li> <li>✓ Conceptual frame work of study</li> <li>✓ Objective writing</li> <li>✓ General objective</li> <li>✓ Specific objectives</li> </ul>	and 10 hrs./wk
9-13	<b>Methodology</b> <ul style="list-style-type: none"> <li>✓ Components of research method</li> <li>✓ Selection of study design</li> <li>✓ Selection of target population</li> <li>✓ Sampling and sampling techniques</li> <li>✓ Errors in sampling</li> <li>✓ Identification and operationalization of research variables</li> <li>✓ Methods and procedure of data collection</li> <li>✓ Data analysis, interpretation and synthesis</li> <li>✓ Quality assurance techniques in research</li> <li>✓ Work plan and budget break down</li> <li>✓ Research findings dissemination</li> <li>✓ Writing research proposal</li> <li>✓ Writing research report</li> <li>✓ Research ethics</li> </ul>	14 hrs./wk
14	Nursing research practice and trends	6 hrs./wk
15	<b>Proposal writing</b> <ul style="list-style-type: none"> <li>✓ Students will identify nursing problem at a community or health facility level</li> <li>✓ Formulate a research title</li> <li>✓ Prepare and submit a complete research proposal</li> <li>✓ Questioner development</li> </ul>	14 hrs./wk
17	<b>Application of software in research</b> <ul style="list-style-type: none"> <li>✓ Fore data collection</li> <li>✓ For data analysis</li> <li>✓ For data interpretation</li> <li>✓ For report presentation</li> </ul>	10 hrs./wk

## Reference Books

1. Hott JR. Buddin WC. Notters Essentilas of Nursing research. Sixth edition, 1999
2. . Holzemer W. Improving health through nursing research, 2010.
3. Hoskins C. and Mariano C. Research in Nursing and health; understanding and using quantitative and qualitative methods. Second edition, 2004.
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7. Daniel. Biostatistics: a foundation for analysis in health sciences.
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11. Jolley J. Introducing research and evidence based practice for nurses, 2010.
11. Maltby J., Williams G., McGarry J. and Day L. Research methods for nursing and health care, 2010.

## PRE-INTERNSHIP EXAM

Course Title: Pre-internship exam

Course code: Nurs 4043

ECTS: 5

Course duration: four weeks

Course grading: Pass/Fail

### Course/exam Description

The pre-internship examination module is designed to assess the students' competency level in the areas of the major core comprehensive nursing modules and determine if the student has to move to the internship practice so that he/she will provide quality & safe comprehensive nursing care to the recipients. Student who passes the pre-internship examination will be assigned in hospital to practice in Medical, Surgical, Paediatrics and child health, and Obstetrics and Gynaecology wards. Each posting lasts for four week. Student will take full responsibilities for his/her duties including night times and holidays.

### Course/exam Objectives

The examination module will:

1. Assess students competency level (Knowledge, Attitude and/or Practice) level on the following modules;
  - ✓ Foundation of Nursing I& II
  - ✓ Medical Surgical Nursing
  - ✓ Maternity and Reproductive Health Nursing
  - ✓ Paediatric and child health Nursing

### Description of the exam

1. The pre-internship examination will consist of **four** separate exam booklets and practical exam/OSPE/OSCE on the following areas
  - ✓ Foundation of Nursing I & II
  - ✓ Medical Surgical Nursing
  - ✓ Maternity and Reproductive Health Nursing
  - ✓ Paediatric and Child Health Nursing
2. The pass score for each written and practical exam is **60%**.
3. Progression to internship will require successfully passing qualifying assessment as **pass or fail** which comprises the following component:

### **Internal**

- ✓ Comprehensive written exam (30%)

### **External**

- ✓ OSCE (50%)
- ✓ Standardized external oral exam (20%)

4. Student who fails in pre-internship in each module shall repeat each attachment for one month in the area where he/she failed before pre-internship re-examination. If the student fails again on re-examination the student repeat the module of specific competency he/she failed.

## **MEDICAL NURSING INTERNSHIP**

**Module Title:** Medical Nursing Internship

**Module Code:** NursM-4223 **ECTS:** 7 **Module Duration:** 5 Weeks (including summative assessment)

**Approach:** BLOCK system

**Prerequisites:** Medical surgical nursing II with its practicum

**Module Description:** This module is designed for students to provide opportunities to synthesize and integrate the Knowledge, Skill and Attitude they have learned and practiced in the classroom, demonstration room, clinical simulation room, clinical practice sites and the community, and to apply them in the area of medical care units under minimum supervision.

### **Module Objective**

By the end of this module, students will be able to provide quality, culturally sensitive comprehensive independent & interdependent nursing care for individuals and families using nursing process as framework in the area of medical units in accordance with nursing professional codes of conduct and principles.

### **Supporting Objectives**

To meet the above module objective the students will be able to:

1. Identify and manage common medical disorders using nursing process as a framework
2. Analyses, understands and makes professional clinical judgment, upholds ethical practice, and maintains respect for the patients and families.
3. Practice quality nursing care by the adoption of a holistic and individualized approach to the patient in accordance with relevant legislation, policies and guidelines of the health care facility

4. Plan an efficient and effective communication system with the patient/family/significant others, the multidisciplinary team and other relevant departments.
5. Organize a group of peers and other professionals, bearing in mind the subsystem and the organization's purposes, and the results of the activity
6. Formulate his/her professional portfolio in order to personally develop and meet the required knowledge and skill for constantly evolving specialization.
7. Plan to use resources effectively and efficiently in the provision of quality nursing care
8. Prepare to actively teach, mentor and supervise junior students with in the working area.
9. Devise high quality, culturally sensitive health education and advise to patients, relatives and at-risk groups according to their needs to help them reach in decisions and to maximize the wellbeing of community
10. Demonstrate proper documentation and reporting skills for dependent and independent activities regularly
11. Question any inappropriate medical care plan for their patients in the unit
12. Manage the safety of patient care environment
13. Justify any type of care plan they prepare for their patients, family and community.
14. Interpret basic laboratory values
15. Support patients and other health team during advanced procedures.
16. Formulate admission and discharge planning for patients with medical problems
17. Comply with infection prevention practices
18. Manage common STIs using syndromic approach

**Areas to be covered with this module**

- Providing basic nursing care for patients with medical disorders
- Assisting during advanced medical procedures
- Care plan
- Professional attitude, ethics,

**Practice site:** Hospitals or health centers

**Location:** Medical ward/units/outpatient

**Teaching and learning methods**

Demonstration of key task



- Guided practice (coaching)
- Case Based Discussion (CBD)
- Seminar presentations (individual/group tutorials)
- Nursing round /bedside teaching
- Group discussion following exposure to any learning experience Independent study and practice

**Methods of assessment Formative**

- i. Workplace based assessments)
  - Mini-Clinical Evaluation Exercise (mini-CEX)
  - Clinical Encounter Cards (CEC)
  - Clinical Work Sampling (CWS)
  - Blinded Patient Encounters (BPE)
  - Case-based Discussion (CbD)
  - MultiSource Feedback (MSF)
  - Direct Observation of Procedural Skills (DOPS)
- ii. Oral exam
- iii. Written test
- iv. Review of student log book, portfolio etc... that show student learning
- v. Review of reports, procedures, care plan, assignment, project etc... developed by the student (may be part of portfolio
- vi. Expert judgment (global rating)
- vii. Use of multisource (360 degree)
- viii. Documented and verified reports from supervisor, colleague, subject expert, trainer or others(third party report)
- ix. Reflective practice
- x. Case study
- xi. Report from resident staff/nurses

**Summative**

- ✚ DO (direct observation of performance ) ----- (40%)
- ✚ Review of portfolio ----- (20%)
- ✚ OSCE/Oral ----- (30%)
- ✚ Others (bedside, seminar, case based) ----- (10%)

**Key professional practice /key tasks**

- Assess, diagnose and manage patients with medical disorders using nursing process
- Doing physical examination
- Comforting patient (bed making, comfort devices)
- Repairing patient for medication procedures

- Administer medication
- Monitoring of patient's condition/response to the problem or treatment
- Prevent and manage medical complications
- NG tube insertion & feeding
- Catheterization, input & output monitoring
- Documentation & recording
- Interpreting investigations of medical disorders
- Developing nursing care plan
- Implementing developed care plan
- Evaluating care plan
- Prepare bedside & case presentations
- Rounds & regular visits
- Prepare and present seminars
- Oxygen administration and monitoring
- Providing health information for the patients and families
- Prepare fluids with different concentration
- Assist with Lumbar puncture demonstration
- Blood sugar measurement
- Admission and discharge planning
- Assist in care of critically ill patients in the ICU
- Writing client progress notes
- Infection prevention **N.B.:**
  
- There should be night duty during the attachment/internship
- Every day morning session (in each attachment site)
- Every Thursday seminar presentation/at least once a week
- Monday morning clinical round inpatient wards
- Weekly schedule will be prepared by clinical coordinator
- The following key learning activities should be included in each weekly schedule and time should be allocated for each learning activities
- Demonstration of some key tasks by clinical facilitators
- Guided practice\* -Time for students to practice with feedback
- Group discussion- time for facilitated group discussion
- Case based discussion\*- time for facilitating CBD
- Individual/group tutorial(seminar)

- Bedside teaching /Nursing round \*
- Independent study and practice\*
- SURGICAL NURSING INTERNSHIP

**Module Name:** Surgical Nursing Internship

**Pre-requisite (if any):** Medical Surgical Nursing I and II module

**Duration (In Weeks):** 5wks (including summative assessment)

**Module Description:** Also module is designed to provide opportunities to synthesize and integrate the Knowledge, Skills and attitude they have learned in the area of Surgical nursing in the classroom and practicum and apply in surgical inpatient, surgical emergency, operation room and recovery Unit to practice nursing under minimum supervision before graduation.

**Learning outcome:**

To meet the above module objective the student will be to:

- Take in charge surgical inpatient, operation room, recovery unit and activate for managing the day to day activities
- Provide quality, culturally sensitive specialized nursing care for surgical inpatient, operation room and recovery Unit
- Promote effective team working spirit in a multidisciplinary team in the nursing management of surgical patient.
- Participate actively in teaching, mentoring and supervising junior students with in the working area.
- Provide high quality, culturally sensitive health education and advise to patients, relatives and at risk groups according to their needs to help them reach in decisions.
- Provide high quality, culturally sensitive health education to maximize the wellbeing of community
- Provide high quality, culturally sensitive nursing care plan for specific body system disorders using nursing process
- Document and report independent activities regularly
- Incorporate the knowledge of pathophysiology in making diagnosing and providing overall therapeutic managements for patient with Surgical disorder
- Properly involve and take a role in the performance of diagnostic and therapeutic procedure involving Surgical disorder
- Provide appropriate teaching for the patient and family affected by Surgical disorder
- Provide safe and effective nursing care for patients having surger

### **Possible Area of clinical practice units**

- Surgical inpatient
- Surgical emergency
- Surgical OPD
- Minor operation
- Operation room
- Recovery room (PACU)
- CSR (central sterilization)

### **Key performance task/competencies**

- Assess , diagnose and intervene patients with surgical disorders
- Providing nursing care for a patient with surgical problem of body systems
- Preparing patient for surgery
- Practice scrubbing and circulating roles
- Process surgical instruments
- Assess and provide Wound care
- Monitoring of patient's condition and intervene
- Prevent and treat complications
- NG tube insertion
- Input & output monitoring
- Documentation & recording
- Interpreting investigations of lab result
- Developing nursing care plan
- Implementing developed care plan
- Evaluating care plan
- Prepare bedside & case presentations
- Rounds & regular visits
- Bed making

- Administer oxygen for minimum of patients
- Give peri-operative nursing care
- Give a minimum of bed baths
- Pack and sterilize instruments, gloves and rums
- Suturing wound
- Remove wounds stitches  
Give tracheotomy care
- Administering Oxygen
- Enema
- Breathing and coughing exercise
- Perform gastric lavage
- Give nasal feeding (gavage)
- Urinary Catheterization
- Give intramuscular injection
- Give subcutaneous injection
- Give intravenous injection
- Set and give IV infusion
- Blood transfusion
- Take blood sample
- Perform general physical examination
- Assist in:-
- Abdominal paracentesis
- Liver biopsy
- Lumbar puncture
- Traction applications
- Cast care procedure
- Bronchoscopy procedure ▪ Colonoscopy procedure

- Endoscopy procedure
- Colostomy care
- Treat and care for patient with feco-oral disease
- Provide care for patient with immobilization devices Crutch walking counseling and demonstration

### **Teaching –learning methods and activities**

- Demonstration of key task
- Guided practice ( coaching)
- Case Based Discussion (CBD)
- Seminar presentations(individual/group tutorials)
- Nursing round /bedside teaching
- Group discussion following exposure to any learning experience
- Independent study and practice

### **Learning assessment methods Formative**

- Workplace based assessments select the applicable one
  - ✦ *Mini-Clinical Evaluation Exercise (mini-CEX)*
  - ✦ *Clinical Encounter Cards (CEC)*
  - ✦ *Clinical Work Sampling (CWS)*
  - ✦ *Blinded Patient Encounters (BPE)*
  - ✦ *Case-based Discussion (CbD)*
  - ✦ *MultiSource Feedback (MSF)*
  - ✦ *Direct Observation of Procedural Skills (DOPS)*
- Oral exam
- Written test
- Review of student log book, portfolio etc... that show student learning
- Review of reports, procedures, care plan, assignment, project etc... developed by the student (may be part of portfolio)

- Expert judgment (global rating)
- Use of multisource (360 degree)  
Documented and verified reports from supervisor, colleague, subject expert, trainer or others(third party report)

### **Summative**

- Direct observation of individual performance = 40%
- OSCE wit oral exam= 30%
- Review of student portfolio( log book, reports, assignments, projects etc...completed by students) =20%
- Others (bedside, seminar, case based) ----- (10%)

### **N.B.**

- There should be night duty during attachment
- Every day morning session (in each attachment site)
- Every Thursday seminar presentation or CBD
- Monday morning clinical round inpatient wards
- Weekly schedule will be prepared by clinical coordinators
- The following key learning activities should be included in each weekly schedule and time must be allocated
- Demonstration of key selected task by clinical instructors
- Guided practice (coaching)-time for students to observe, practice and perform,
- Case Based Discussion (CBD)-at least 2 hr/week to facilitate CBD
- Seminar presentations (individual/group tutorials)
- Nursing round /bedside teaching
- Group discussion following exposure to any learning experience
- Independent study and practice

# MATERNITY NURSING PROFESSIONAL PRACTICE

**Module title:** Maternity and reproductive health nursing professional practice

Module Code: Nurs 4243 EtCTS: 8

**Pre-requisite:** All theoretical and practical modules

**Duration (Weeks):** 5 weeks (including examinations)

**Description:** This internship is designed for comprehensive BSc nurse students to provide nursing care in maternity ward using nursing process for mothers with normal & abnormal pregnancy, labour, puerperium and gynecological cases, while identifying and referring complicated obstetric and gynecological cases for better management. Moreover, it equips them to provide services reproductive health services base on client and/or patient need.

## **Learning outcome**

- At the end of the attachment period the student will be able to identify the reproductive needs of the client and provide basic obstetrics and gynecology care, nurse patient relationship, sense of responsibility, effective communication skills, and show responsible behavioral changes towards the care of mothers and new born. **Key performance task/competencies**

By the end of the internship, students will be able to:

- Provide comprehensive ANC including PMTCT service
- Manage women with pregnancy complications
- Conduct normal delivery
- Provide immediate newborn care
- Perform Neonatal Resuscitation
- Provide post natal care and health education
- Perform and repair an episiotomy
- Follow the principles of infection prevention and standard precaution while performing any procedure.
- Provide active management of third stage of labour (AMTSL)
- Manage complications of third stage of labor
- Manage obstetrics emergencies during labor and delivery
- Perform/Assist instrumental delivery
- Perform pre and post-operative care
- Provide postpartum nursing care
- Provide comprehensive family planning services
- Provide comprehensive abortion care
- Provide nursing care for women's with gynecologic problem using nursing process as framework.
- Refer case if beyond scope of practice



- Demonstrate nursing skills and professional attitude in the daily activities of the clinical area following MRC principles
- Apply counseling skill
- Recording and reporting patient finding
- Carry out admission and discharge documentation
- Document client progress notes

**Teaching –learning methods at clinical practice**

- Guided practice ( coaching)
- Seminar presentation / assignment/project /report ...
- Group discussion following exposure to any learning experience
- Independent study and practice
- Case study
- Bed side discussion

**Teaching –learning materials and resources**

- This will include: Reference text books, national service delivery guidelines, learning guides, SOP, checklists, video, medical equipment and supplies, etc....

**Teaching –learning assessment policies/guideline and methods**

- Guided community practice
- Facilitated discussion after exposure of learning experience
- Independent study
- Small group work □ Seminar

Direct observation by instructor using checklist, or preceptor , seiner student and clinical instructors this includes punctuality, participation and ethics and attitude	review Portfolio (care plan, daily activity, logbook .) the student document	SCE with oral exam	seminar, bed side and case discussion
40%	20 %	30%	10%

**Performance assessment methods Module policy:**

- Attendance is 100% mandatory without justifiable reasons i.e., without reporting to the instructor and/ having medical certificate he/ she will end up with one year delay and repeat that particular internship.
- If a student is absent with medical certificate or justifiable reasons he/she compensates it.
- If a student is absent without justifiable reasons s/he will repute the internship ➤ Students are expected to work including night and weekend time. **N.B.:**
  - There should be night duty during attachment

- Every day morning session (in each attachment site)
- Every Thursday seminar presentation or CBD
- Monday morning clinical round inpatient wards
- Weekly schedule will be prepared by clinical coordinators
- The following key learning activities should be included in each weekly schedule and time must be allocated
  - ✓ Demonstration of key selected task by clinical instructors
  - ✓ Guided practice ( coaching)-time for students to observe, practice and perform,
  - ✓ Case Based Discussion (CBD)-at least 2 hr/week to facilitate CBD
  - ✓ Seminar presentations(individual/group tutorials)
  - ✓ Nursing round /bedside teaching
  - ✓ Group discussion following exposure to any learning experience
  - ✓ Independent study and practice

**Module Schedule (typical week)** ○ Total duration= **5 weeks**  
 ○ Clinical practice =28hr/week ○ Case based discussion =2hr/week

Attachment area	Task	Week
ANC and family	<input type="checkbox"/> Attend orientation on (learning outcome, code of	

planning units	<p>conduct, assessment policies,&amp; setting )</p> <ul style="list-style-type: none"> <li>• Preform registration using various formats</li> <li>• Take history</li> <li>• Conduct physical examination</li> <li>• Identify danger sign during pregnancy</li> <li>• Request and interpret ANC related lab investigation</li> <li>• Provide short acting FP methods</li> <li>• Assist insertion and removal of long acting contraceptives</li> <li>• Discuss case</li> <li>• Mentor junior nursing students</li> </ul>		
ANC and family planning units	<ul style="list-style-type: none"> <li>• Provide ANC and PMTCT</li> <li>• Provide short acting FP methods and insert and remove of long acting contraceptives</li> <li>• Interpret ANC related lab investigation</li> <li>• Discuss Cases</li> <li>• Give Health Education</li> <li>• Conduct FP Counselling</li> <li>• Present Seminar</li> <li>• Mentor junior nursing students</li> </ul>		
Labour	<ul style="list-style-type: none"> <li>✓ Attend orientation on (learning outcome, code of conduct, assessment policies,&amp; setting )</li> <li>✓ Provide nursing care such as Vital sign, IV secure, catheterization, medication administration, blood</li> </ul>		
ward	<p>transfusion, ...</p> <ul style="list-style-type: none"> <li>✓ Preform registration using various formats</li> </ul>		

	<ul style="list-style-type: none"> <li>✓ Take History</li> <li>✓ Conduct physical examination</li> <li>✓ Assist normal labour (Diagnosis, follow normal labour using partograph)</li> <li>✓ Assist normal labour and delivery</li> <li>✓ Perform AMTSL, and newborn care</li> <li>✓ Prepare equipment for labour and delivery</li> <li>✓ Provide postnatal care</li> <li>• Observe abnormal labour and delivery follow up and managements</li> <li>• Mentor junior nursing students</li> </ul>	
Labour ward	<ul style="list-style-type: none"> <li><input type="checkbox"/> Provide nursing care such as Vital sign, IV secure, catheterization , medication administration, blood transfusion, ...</li> <li><input type="checkbox"/> Take History</li> <li><input type="checkbox"/> Conduct physical examination</li> <li><input type="checkbox"/> Manage Normal labour (Diagnosis, follow normal labour using partograph)</li> <li><input type="checkbox"/> Perform normal labour and delivery</li> <li><input type="checkbox"/> Perform AMTSL, and newborn care</li> <li><input type="checkbox"/> Provide postnatal care</li> </ul>	
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Assist abnormal labour and delivery</li> <li><input type="checkbox"/> Perform sterilization techniques</li> <li><input type="checkbox"/> mentor junior nursing students</li> </ul>	

<p>Oby/gyni OPD</p>	<ul style="list-style-type: none"> <li>○ Attend orientation on (learning outcome, code of conduct, assessment policies,&amp; setting )</li> <li>○ Provide nursing care such as Vital sign, IV secure, catheterization ...</li> <li>○ Take Gynecologic history using nursing approach</li> <li>○ Assist in Dx abnormal pregnancy, labour and delivery where beyond scope consult or refer</li> <li>○ Provide Post Abortion care</li> <li>○ Discussion on selected Case</li> <li>○ mentor junior nursing students</li> </ul>	
<p>Gyn ward</p>	<ul style="list-style-type: none"> <li>□ Attend orientation on (learning outcome, code of conduct, assessment policies, &amp; setting)</li> <li>□ Provide nursing care such as Vital sign, IV secure, catheterization, medication administration, blood transfusion, wound care ...</li> <li>□ Take Gynaecologic history using nursing process as framework</li> <li>□ Provide nursing care for women having gynaecologic abnormality</li> <li>□ Implement nursing process on women admitted in gynaecology ward</li> <li>□ Discuss case</li> </ul>	
	<ul style="list-style-type: none"> <li>□ Presentation case and seminars</li> <li>□ Discuss bedside</li> <li>□ Conduct nursing round</li> <li>□ Mentor junior nursing students</li> </ul>	

# PEDIATRICS AND CHILD HEALTH NURSING INTERNSHIP

**Module Title:** Pediatrics and Child Health Nursing Internship

**Module Code:** NursM-4253 **Module Duration:** 5 Weeks (including summative assessment) **Module ECTS:**7

**Prerequisites:** All Modules except TTP and Research Project

**Module Description:** This module is designed for comprehensive BSc Nursing students to provide opportunities to Synthesize and integrate the Knowledge, Skill and Attitude they have learned and practiced in the classroom, demonstration room, clinical simulation room and the community, and to apply them under minimum supervision **Module Objectives:**

After completing of this module, the student will be able to:

- Monitor the growth and development of newborns, infants and children
- Exercise teamwork in the provision of individualized patient care
- Apply nursing care plan using the nursing process approach.
- Apply preventive measures on childhood problems
- Manage common Pediatric and childhood illnesses
- Manage common under five problems using IMNCI protocol
- Apply Compassionate, Respectful and caring
- Establishes an efficient communication with the patient/family/and others
- Demonstrate the principles of leadership and management
- Provide care for physically, mentally, and socially children with disability
- Manage newborn and childhood illnesses using National Guidelines
- Provide palliative care for children with life-limiting illnesses
- Manage Pediatric Tuberculosis and HIV

## Key tasks

Manage Common Neonatal Problems

Perform Essential new born care

Perform New born assessment

- Perform Neonatal Resuscitation
- Counsel optimal Nutrition
- Demonstrate proper attachment and position on Breast feeding
- Demonstrate KMC
- Operate Radiant warmer, Phototherapy, Incubator

- Perform NG tub, Cup feeding
- Cup feeding
- Measure Vital Sign
- Use Pulse oxymeter for monitoring progress
- Apply hot and cold compression
- Administer Oxygen
- Perform CPAP
- Prepare IV maintenance fluid
- Assist Exchange Blood transfusion
- Collect Blood sample
- Perform Catheterization
- Measure Input and output
- Manage Dehydration
- Assist Indotracheal intubation
- Evaluate Nutritional Status

Manage malnutrition

Evaluate Sick child who needs Emergency management

Perform Ear irrigation and Eye irrigation

Execute Postural drainage, Thoracentesis and Water –seal drainage

Assist Tracheotomy care

- Perform CPR
- Assist Removing foreign body form eye, ear & nose
- Perform wound care
- Manage burned Child
- Applying comfortable device

- Applying sand bag
- Applying Splint
- Applying fracture board
- Perform Application and Removal of cast and Traction
- Assist Lumbar puncture
- Administer Medication
- Perform diagnostic and therapeutic gastric aspiration
- Apply the different types of enema
- Apply colostomy care
- Prepare fluids with different concentration
- Administer fluids for dehydrated patients
- Administer Enema
- Assist Pre-cutaneous urine aspiration
- Assist Male circumcision
- Monitor Growth and Development
- Apply counseling skill
- Apply counseling skill
- Recording and reporting patient finding
- Carry out admission and discharge documentation
- Document Client progress notes
- Apply infection prevention

### **Teaching –learning methods and activities**

- Demonstration of key task
- Guided practice (coaching)
- Case Based Discussion (CBD)



- Seminar presentations (individual/group tutorials)
- Nursing round /bedside teaching
- Group discussion following exposure to any learning experience
- Independent study and practice

### **Learning assessment methods Formative**

- Workplace based assessments)
- Mini-Clinical Evaluation Exercise (mini-CEX)
- Clinical Encounter Cards (CEC)
- Clinical Work Sampling (CWS)
- Blinded Patient Encounters (BPE)
- Case-based Discussion (CbD)
- MultiSource Feedback (MSF)
- Direct Observation of Procedural Skills (DOPS)
- Oral exam

#### Written test

Review of student log book, portfolio etc... that show student learning

Review of reports, procedures, care plan, assignment, project etc... developed by the student (may be part of portfolio)

- Expert judgment (global rating)
- Use of multisource (360 degree)
- Documented and verified reports from supervisor, colleague, subject expert, trainer or others(third party report)

### **Summative**

- Direct observation of individual performance = 40%
- OSCE wit oral exam= 30%
- Review of student portfolio( log book, reports, assignments, projects etc...completed by students) =20%

- Others (bedside, seminar, case based) ----- (10%)

**N.B** ∴

- ❖ There should be night duty during attachment
- ❖ Every day morning session (in each attachment site)
- ❖ Every Thursday seminar presentation or CBD
- ❖ Monday morning clinical round inpatient wards
- ❖ Weekly schedule will be prepared by clinical coordinators
- ❖ The following key learning activities should be included in each weekly schedule and time must be allocated
- ❖ Demonstration of key selected task by clinical instructors
- ❖ Guided practice ( coaching)-time for students to observe, practice and perform,
- ❖ Case Based Discussion (CBD)-at least 2 hr/week to facilitate CBD
- ❖ Seminar presentations(individual/group tutorials)
- ❖ Nursing round /bedside teaching
- ❖ Group discussion following exposure to any learning experience
- ❖ Independent study and practice

## **TEAM TRAINING PROGRAM (TTP)**

**Module Title: Team training program (TTP)**

**Module Code: SPHM4102**

**ECTS: 7**

**Duration: 8 Weeks**

Professionals and level of education: Undergraduate Health professionals Training

**Module Description:** This TTP is designed for undergraduate health professional to equip with the required knowledge, attitude and skills that can achieve an understanding of how collaboration applies to healthcare to deliver the highest quality of care across setting by providing opportunity to participate in inter-professional education which will enable them to be collaborative-practice ready health work force.

### **Module General Objective**

At the end of this module the students will be able to provide comprehensive services (both clinical and non-clinical health-related work) in a collaborative team environment by working with patients, their families, carers and communities to deliver the highest quality of care across setting which in turn optimizes health-services, strengthens health systems and improves health outcomes

### **Learning outcomes**

- Provide comprehensive services (both clinical and non-clinical health-related work, such as diagnosis, treatment, surveillance, health communications, management and sanitation etc...) a collaborative team environment by working with patients, their families, carers and communities to deliver the highest quality of care across setting
- Work with individuals of other professions to maintain a climate of mutual respect and shared values
- Use the knowledge of one's own role and those of other professions to appropriately assess and address the healthcare needs of the patients and populations served.
- Communicate with patients, families, communities, and other health professionals in a responsive and responsible manner that supports a team approach to the maintenance of health and the treatment of disease.
- Apply relationship-building values and the principles of team dynamics to perform effectively in different team roles to plan and deliver patient-/population-centered care that is safe, timely, efficient, effective, and equitable.
- Interact, negotiate and collaborate with colleagues from other professions (learn from each other) during providing clinical and non-clinical service
- Respect for the values and beliefs of their colleagues during providing clinical and non-clinical service
- Learn to appreciate the challenges and benefits of working in teams during providing clinical and non-clinical service

- Communicate and consult each other to optimize care for the patient during providing clinical and non-clinical service
- Jointly work with a common set of problem with shared responsibility and decision- making for patient care and foster a collaborative learning environment (learn with each other)

### **Teaching-Learning Methods**

1. Guided Community visit, survey and practice
2. Guided project work
3. Guided clinical practice (Task based learning)
4. Case/problem - based learning
5. Seminar
6. Facilitated Group discussion
7. Reflective Portfolio
8. Personal research and reflection exercise (PRRE)
9. Teaching learning materials
10. AV aids (LCD and computer or Overhead projector and transparencies, writing board and marker or chalk)
11. Computers with internet and data analysis software
12. Logbooks for entry of community experience
13. Stationeries for community survey
14. Drugs, equipment, tools and materials for clinical and public health interventions

### **Assessment Methods**

#### **Formative assessment**

- Direct observation of performance ( clinical area, community setting,
- Written test
- Oral questioning /interview
- Review of task (assignment, project , activity report , logbook, portfolio) completed by students
- Global rating midway during TTP
- Seminar presentation
- Review of Reflective portfolio

#### **Summative assessment**

1. Feedback from colleagues and supervisors/peer (360-degree evaluation (20 %)
2. Feedback from immediate supervisor using Global rating scale (20 %))

3. Review of task (assignment, project, activity report including mini project, community diagnosis etc..) completed by students (50%)
4. Review of Reflective portfolio (10%) Attendance or participation requirement

**Attachment Schedule (8weeks)**

	<b>Key practice area</b>	<b>Duration</b>
1	Community Surveillance (CS)	1 week
2	Clinical practice ( Dx, Rx..) (CP)	1 week
3	School Health Service + Outreach and health institutions supervision activities (SHS &OR,Sup	1 week
4	Prison Health Service + Environmental health activities(PHS & EHA)	1 week
5	Primary Health Care (PHC) evaluations (PHC)	1 week
6	Inter-Professional Education (IPE)	1 week
7	Mini-project work (MP)	1 week
8	Home visiting (HV)	4 hr /week for 7 weeks (Every Friday morning)

Week 8	Evaluate effectiveness and efficiency of the service rendered and the community learning experience Overall reporting and discussion
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**Typical weekly schedule**

<b>Week</b>	<b>Area of practice</b>						<b>Remark</b>
1	Community surveillance						All students
2	IPE						All small group
3	CP	SHS	PHS	PHC	MP		
4	G1	G2	G3	G4	G5		
5	G5	G1	G2	G3	G4		
6	G4	G5	G1	G2	G3		
7	G3	G4	G5	G1	G2		
8	G2	G3	G4	G5	G1		

N.B.

- All the team will involve in community surveillance in the first week of TTP
- Students will divide in 5 small groups starting from 2 week of TTP and each group will be assigned and practice IP learning activities
- Starting from 3<sup>rd</sup> week, each small group will be assigned in one practice area for a week and rotate every week
- Each group apply principle of IPE (collaborative work with a common set of problem with shared
- Responsibility and decision-making, communication, consultation, interaction, respect ) in all practice area.

Seminar –each team will have their on seminar on the identified patient /community problem to be solved and the team explain, argue , reason and debate on it.

- Implementation of mini-project by each will continue till the end of the TTP practice
- Out reach and health facilities supervision will be conducted in the same week along with SHS and PHS
- All group will conduct home visiting every Friday morning

	Monday	Tuesday	Wednesday	Thursday
AM	key activities			

### 1. Community Diagnosis

It is the process of identification and detailed description of the most important health problems of a given community. The objectives of this community diagnosis attachment is to enable students identify major health & health related problems & set priorities, understand the health status of the population, design the possible interventions to alleviate the major identified problems, identify resource for the intervention, mainly resources available in the community, and implement interventions with full participation of the community

### 2. Inter-Professional Education (IPE)

Inter-professional education occurs when two or more professions from different backgrounds learn about, from and with each other to enable effective collaboration and improve health outcomes. This includes working with individuals of other professions to

maintain a climate of mutual respect and shared values, understanding of how professional roles and responsibilities complement each other in patient-centered and community/population-oriented care, and communicate with patients, families, communities, and other health professionals in a responsive and responsible manner that supports a team approach to the maintenance of health and the treatment of disease.

<b>PM</b>	<ul style="list-style-type: none"> <li>➤ Select the area/community,</li> <li>➤ Communicate with the relevant bodies in area/community,</li> <li>➤ Develop tools of data collection, pretest and standardize the tools/instruments,</li> <li>➤ Mapping and zoning the study area and number the houses,</li> <li>➤ Collect, process, analyze data, and write up,</li> <li>➤ Select appropriate intervention</li> <li>➤ Design an action plan</li> </ul>
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N.B. There should be a general orientation and discussion for all students before grouping on the following key points of IPE

- Concept and benefit of IPE and collaborative practice
- Core competencies/outcome / of IPE, ground rules
- Selected learning activities and learning environments
- Key tasks to be executed during the IPE week
- Application of IPE principles to the rest of TTP activities
- Formative and summative assessment methods of Inter-professional learning using reflective portfolio

	<b>Monday</b>	<b>Tue</b>	<b>Wed</b>	<b>Thursday</b>	<b>Friday</b>
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AM	<p><b>Identification common set of problem and planning</b></p> <p>Review and understanding of core competency / objectives of IPE and collaborative practice</p> <p>Consensus on the ethical principles /ground rules to guide all aspects of patient care and team work</p> <p>Identification of patient /community problems to be solved or /pt/community care/service to be provided collaboratively (Based on community diagnosis)</p> <p>Identification and selection of set of interventions to be implemented to solve problem/selection of strategies to provide care/service</p> <p>Clarify each member's responsibility in executing components of a treatment plan or public health intervention</p>	Team work	Team work	<p><b>Team work ....cont.d</b></p> <p>Seminar ( on the identified patient /community problem to be solved and team explain, argue , reason and debate on it)</p>	Home Visiting
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	<p>Jointly plan and share responsibilities (develop joint action plan). Action plan includes</p> <p>Activities/tasks to be implemented</p> <p>Responsible profession</p> <p>Resource needed</p> <p>TimeLine</p>				
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PM	<p><b>Working together</b></p> <p>Implement interventions in collaborative and consultative manner with shared responsibilities and decision making</p> <p>Perform range of tasks together</p>	Team work	Team work	<p><b>Review meeting</b></p> <p>Team meet together and each members</p> <p>Explain implemented intervention/activities</p> <p>Justify/discuss/argue the rationale for each intervention given</p> <p>Reflection on individual and team performance for individual, as well as team, performance improvement.</p> <p><b>Evaluation of IPE</b></p> <p><b>Evaluation focused on degree of :</b></p> <p>Collaboration work with a common set of problem</p> <p>Communicate and consultation of each other</p> <p>Integration of the knowledge and experience of other professions—appropriate to the specific care situation—to inform care decisions, Respecting the unique cultures, values, roles/responsibilities, and expertise of other health professions</p> <p>Engagement of other health professionals— appropriate to the specific care situation—in shared patient-centered problem-solving.</p> <p>Working in cooperation with other health professions, and others who contribute to or support the</p> <ul style="list-style-type: none"> <li>• delivery health</li> <li>• services</li> <li>• Sharing accountability with</li> </ul>	Weekly activity report
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			<p>there professions Learning about, from and with each other Benefits &amp;</p> <ul style="list-style-type: none"> <li>Challenges of working in teams</li> </ul> <p>Understanding of how professional roles and responsibilities complement each other in patient - centered and community/population oriented care</p> <p>Able to clearly describe one's own professional role and responsibilities to team members of other professions and understand others' roles and</p>	
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### 1. Clinical practice

The team in the clinical practice is expected to provide promotive, preventive, curative and rehabilitative services. In the health care facility, the team can deal with conditions/illness that need more investigations and attention.

	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
<b>AM</b>	<p>1. Review and understanding of core competency / objectives of IPE and collaborative practice</p> <p>2.Consensus on the ethical principles and ground rules to guide all aspects of patient care and team work Clarify each member's responsibility in executing components of a treatment plan or public health intervention</p> <p>Discuss how to effectively work in collaboration, consultation and communication with each professions on set of problem</p> <p>Engagement of other health professionals— appropriate to the specific care situation— in shared patient-centered problem solving</p>	<p>Provide comprehensive services in a collaborative team environment</p>	<p>Provide comprehensive services in a collaborative team environment</p>	<p>Team work</p> <p><b>Seminar ( on the identified patient /community problem to be solved and team explain, argue , reason and debate on it)</b></p>	<p>Home visiting</p>

<p><b>PM</b></p>	<p>Provide comprehensive services in a collaborative team environment (Team work)</p>	<p>Team work</p>	<p>Team work</p>	<p><b>Review meeting</b></p> <p>Team meet together and each team members          Explain implemented intervention/activities          Justify/discuss/arg ue the rationale for each intervention given          Reflection on individual and team performance for individual, as well as team, performance improvement.</p> <p><b>Evaluation of IPE</b></p> <p><b>Evaluation focused on degree of :</b></p> <p>Collaboration work with a common set of problem          Communicate and consultation of each other          Integration of the knowledge and experience of other professions— appropriate to the specific care situation—to inform care decisions,          Respecting the unique cultures, values, roles/responsibilities, and expertise of other health professions</p>	<p>Weekly activity report</p>
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				Engagement of other health professionals—appropriate to the specific care situation—in shared patientcentered problemsolving. Working in cooperation with other health professions, and others who contribute to or support the delivery health services Sharing accountability with other professions Learning about, from and with each other Benefits & Challenges of working in teams	
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### 6. School Health Services (SHS)

School health service is a health service that is offered in the school, which focuses mainly on prevention of diseases and promotion of health. The objective is to create conducive environment for teaching learning process, prevent transmission of communicable diseases in the school, identify and treat diseases at their earlier stage in order to prevent further suffering, disability and death and promote health of students

	<b>Monday</b>	<b>Tuesday</b>	<b>Wedn esday</b>	<b>Thursday</b>	<b>Friday</b>
<b>AM</b>	Review and understanding of core competency / objectives of IPE and collaborative practice and its application in SHS Consensus on the ethical principles	<b>Team work</b>	<b>Team work</b>	Team work	

	<p>/ground rules to guide all aspects of patient /community care and team work</p> <p>.Identification of patient/community problems to be solved or care/service to be provided collaboratively ( Based on community diagnosis)</p> <p>Identification and selection of set of interventions to be implemented to solve problem/selection of strategies to provide care/service.</p> <p>Clarify each member's responsibility in executing components of a treatment plan or public health intervention</p> <p>Jointly plan and share responsibilities (develop joint action plan) action plan includes</p> <p>Activities/tasks to be implemented</p> <p>Responsible profession</p> <p>Resource needed</p> <p>TimeLine</p>			<p>Seminar ( on the identified patient /community problem to be solved and team explain, argue , reason and debate on it)</p>	<p>Home visiting</p>
<p><b>PM</b></p>	<p><b>Working together</b> mplement interventions in collaborative and consultative manner with shared responsibilities and decision making</p>	<p>Team work</p>	<p>Team work</p>	<p><b>Review meeting</b></p> <p>Team meet together and each team members Explain implemented intervention/ activities</p> <p>Justify/discuss/ argue the rationale for each intervention given</p> <p>Reflection on individual and team performance for individual, as well as team, performance improvement.</p> <p><b>Evaluation of IPE</b></p> <p><b>Evaluation focused on degree of :</b></p> <p>Collaboration</p> <p>work with a common set ofproblem</p> <p>Communicate and</p>	<p>Weekly activity report</p>

				<p>consultation of each other</p> <p>Integration of the knowledge and experience of other professions—appropriate to the</p> <p>Specific care situation—to inform care decisions, Respecting the unique cultures, values, roles /responsibilities, and expertise of other health professions</p> <p>Engagement of other health professionals—appropriate to the specific care situation—in shared patient-centered problem-solving.</p> <p>Working in cooperation with other health professions, and others who contribute to or support the</p> <p>delivery health services Sharing accountability with other professions</p> <p>Learning about, from and with each other</p> <p>Benefits &amp;</p> <p>Challenges of</p> <p>working in teams</p>
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7. **Prison Health Service** It is one of the setting in which health care service is provided for prisons with the objective of identifying health & health related problems in the prison , maintaining the sanitation of the prison, breaking disease transmission and increasing health awareness of the prison staff and prisoners

	<b>Monday</b>	<b>Tue</b>	<b>Wed</b>	<b>Thur</b>	<b>Friday</b>
	1. Review and understanding of core competency / application in PHS 2. Consensus on the ethical principles /ground rules to guide all aspects of patient /community care and team work 3. Identification of patient /community problems to be solved or care/service to be provided collaboratively (Based on community diagnosis) 4. Identification and selection of set of interventions to be implemented to solve problem/selection of strategies to provide care/service. 5. Clarify each member's responsibility in executing components of a treatment plan or public health intervention 6. Jointly plan and share responsibilities (develop joint action plan) action plan includes Activities/tasks to be implemented Responsible profession Resource needed • TimeLine	team work	Team work	Seminar (on the identified patient /com problem to be solved and team explain, a and debate on it)	

**5. Environmental Health Activities**

It is the prevention of diseases and promotion of health by eliminating or controlling the environmental factors, which form links in the chain of disease transmission. The objectives are to familiarize students on the role of environmental health in diseases prevention and control and promote health, prevent and control diseases through the participation of the community and other concerned bodies

	<b>Monday</b>	<b>Tuesda y</b>	<b>Wed</b>	<b>Thur.</b>	<b>Friday</b>

AM	<p>Review and understanding of core competency / objectives of IPE and collaborative practice and its application in EHA</p> <p>Consensus on the ethical principles /ground rules to guide all aspects of patient /community care and team work</p> <p>Identification of patient /community problems to be solved or care/service to be provided collaboratively (Based on community diagnosis)</p> <p>Identification and selection of set of interventions to be implemented to solve problem/selection of strategies to provide care/service.</p> <p>Clarify each member's responsibility in executing components of a treatment plan or public health intervention</p> <p>Jointly plan and share responsibilities (develop joint action plan) action plan includes Activities/tasks to be implemented</p> <p>Responsible profession</p> <p>Resource needed</p> <ul style="list-style-type: none"> <li>• TimeLine</li> </ul>	Team work	Team work	<p>Team work</p> <p>Seminar ( on the identified patient /community problem to be solved and team explain, argue reason and debate on it</p>	Home visiting
PM	<p><b>Working together</b></p> <p>Implement interventions in collaborative and consultative manner with shared responsibilities and decision making</p>	Working together ....cont. d	Working together ....cont. d	<p><b>Review meeting</b> Team meet together and each team members Explain implemented intervention/activities Justify/discuss/argue the rationale for each intervention given</p> <p>Reflection on individual and team performance for individual, as well as team, performance improvement.</p> <p><b>Evaluation of IPE</b>  <b>Evaluation focused on degree of :</b></p>	Weekly Activity report



			<p>Collaboration work with a common set of problem</p> <p>Communicate and consultation of each other Integration of the knowledge and experience of other professions—</p> <p>appropriate to the specific care situation— to inform care decisions, Respecting the unique cultures, values, roles/responsibilities, and expertise of other health professions Engagement of other health professionals— appropriate to the specific care situation— in shared patient-centered problem solving. Working in cooperation with other health professions, and others who contribute to or support the delivery health services</p> <p>Sharing accountability with other professions</p> <p>Learning about, from and with each other Benefits &amp; Challenges of working in teams</p>
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**6. Mini- project**

It is a small-scale project that will be devised and implemented by the health team to alleviate health and health related problems, which was identified during community diagnosis or other mechanisms. The objectives of the mini-project is to bring the different disciplines together, find out problems, and try to solve them within the limited resources available in the community.

	<b>Monday</b>	<b>Tue</b>	<b>Wedn</b>	<b>Thursday</b>	<b>Friday</b>
<b>AM</b>	Review and understanding of core competency / objectives of IPE and collaborative practice and its application in Mni-project Consensus on the ethical principles /ground rules to guide all aspects of patient /community care and team work Identification of patient /community problems to be solved or care/service to be provided collaboratively ( Based on community diagnosis) Identification and selection of set of interventions to be implemented to solve problem/selection of strategies to provide care/service. Clarify each member’s responsibility in executing components of a treatment plan or public health intervention Jointly plan and share responsibilities (develop joint action plan) action plan includes Activities/tasks to be implemented Responsible profession Resource needed TimeLine	Team work	Team work	Team work            Seminar ( on the identified patient /community problem to be solved and team explain, argue , reason and debate on it)	Home visit

<p><b>PM</b></p>	<p><b>Working together</b></p> <p>Jointly Implement the mini- project in collaborative and consultative manner with shared responsibilities and decision making with full participation of the community and other concerned bodies</p> <p>Monitor and evaluate the mini- project; arrange follow up mechanisms for sustainability</p>	<p>Team work</p>	<p>Team work</p>	<p><b>Review meeting</b></p> <p>Team meet together and each team members</p> <p>Explain implemented intervention/activities</p> <p>Justify/discuss/argue the rationale for each intervention given</p> <p>Reflection on individual and team performance for individual, as well as team, performance improvement.</p> <p><b>Evaluation of IPE Evaluation focused on</b></p> <p><b>degree of :</b> Collaboration work with a common set of problem</p> <p>Communicate and consultation of each other Integration of the knowledge and experience of other professions— appropriate to the specific care situation—to inform care decisions, Respecting the unique cultures, values, roles/responsibilities, and expertise of other health</p>	<p>Weekly report</p>
				<p>professions Engagement of other health professionals—appropriate to the specific care situation—in shared patient-centered problemsolving.</p> <p>Working in cooperation with other health professions, and others who contribute to or support the delivery health services</p> <p>Sharing accountability with other professions</p> <p>Learning about, from and with each other</p> <p>Benefits &amp; Challenges of working in teams</p>	

**7. PHC evaluation**

Primary health care evaluation is the assessment to know the status of PHC components, identify challenges/problems in the implementation of the programs and there by forwarding solution. The objectives are to know the status of PHC components, measure the cost effectiveness and cost efficiency of the programs, identify problems/challenges in the implementation of the programs and develop skills in planning, implementing and evaluating specific PHC programs

	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
<b>AM</b>	Review and understanding of core competency / objectives of IPE and collaborative practice and its application in PHC evaluation  Clarify each member's responsibility in executing components of a treatment plan or	<b>Collection of data</b>	Data analysis and write up	Provision of feedback  Give feed back to the concerned bodies (Oral and written )  Seminar ( on the identified patient /community problem	Home visiti ng

	public health ntervention  <b>Planning</b> Jointly Plan how to conduct the evaluation Planning includes  Identification of indicators for the evaluation of PHC programs  Development of instruments/tools for evaluation  Analyze role and responsibilities of each team member in PHC evaluation share responsibilities			to be solved and team explain, argue , reason and debate on it) •	
<b>PM</b>	• Planning cont.d	Collection of	Data	<b>Review meeting</b>	

## COMPREHENSIVE QUALIFICATION EXAM

Course Title: Comprehensive Qualification Exam

Course code: Nurs 4043

ECTS: 5

Course duration: four weeks

Course grading: Pass/Fail

### Components of this exam shall contain

- ✓ Comprehensive written exam-----40%
- ✓ Structured oral exam-----20%
- ✓ Practical examination /OSCE/-----40%

### N.B:

- ✓ The examination is recommended to incorporate all the seven domains.
- ✓ The examiners include internal for written exam, practical and structured oral examination.
- ✓ Pass mark shall be a cumulative of 60% (for written, practical and oral examination) but the student should score pass mark at least 60% of practical exam.
- ✓ The student who fails the final comprehensive exam shall repeat the practical attachment for the duration of 3 months and then seat for the examination.

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# WALIIF HEALTH SCIENCES AND BUSSINESS COLLEGE

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Department of Medical Laboratory Sciences



Curriculum For

**Bachelor of Science in Medical Laboratory Sciences**

October, 2022  
Harar, Ethiopia

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## **Acknowledgement**

We acknowledge all participant of higher education institutions and universities and all stake holders for the adjustment of the curriculum to be fitted for use in higher education training. We highly valued our Waliif Health Science College for organizing this curriculum revision program and We also appreciate all those staff from the Department of Medical Laboratory Sciences and other units of the college for their valuable inputs during revision of this curriculum.

## **Acronyms**

BSC	Bachelor of Science
CGPA	Grade point Average
CBTP	Community Based Training Program
DOP	Direct Observation Practice
EtCTS	Ethiopian Credit System
FMOH	Federal Ministry of Health
GBV	Gender Based Violence
GTP	Growth and Transmission Plan
HEI	Higher Education Institute
MCQ	Multiple Choice Questions
MoSHE	Ministry of Science and Higher education
OSPE	Objective structured Practical Examination
SIDA	Swedish international development agency
SOP	Standard Operating Procedure
SPH	School of Public Health
SRH	Sexual & Reproductive Health
WHSBC	Waliif health science and business college

## **1. Background**

The strength of a healthcare system, in addition to physical infrastructure, depends on the skills, competencies, values and availability of its work force. In sub-Saharan Africa, there is a severe shortage and imbalance in its workforce.

Ethiopia is distinguished by a low level of socioeconomic development and access to healthcare. As a result, there is an insufficient number of health professionals relative to the population.

The present Ethiopian health policy prioritizes the rural and underprivileged urban populations in order to promote health and prevent disease. The availability of both high-quality and sufficient numbers of qualified health professionals is essential for the policy's successful implementation.

The mainstay for a nation's progress and the solution to its pervasive challenges is education. It can present chances for a nation's population to play a crucial part in bringing about and maintaining the necessary development in a variety of sectors, the health delivery system being no exception.

The laboratory service is a crucial part of the healthcare delivery system, hence qualified workers are needed to obtain reliable results essential for service providers to accurately assess the status of a patient's health, make accurate diagnoses, design treatment, as well as for early detection, notification and response to disease outbreaks.

Some of the shortages have been linked to a lack of retention strategy and a shortage of appropriate training institutions to build a competent and critical workforce. There is a critical need to build a strong and competent laboratory workforce to properly staff public health laboratory and to provide quality laboratory service.

### **1.1. College profile**

WALIIF Health Sciences and Business college (WHSC) is going to be established at Harari region, Harar city eastern Ethiopia, is one of the five sectors under WALIIF Health Care S.C Which is founded by shareholders from private health company, banks and insurances, private investors, public sectors, health professionals, and individual people (farmers, students, etc.). WALIIF Health Care S.C has a vision of being an outstanding health care company in providing quality, efficient and affordable health services in Ethiopia, Africa and the world. To realize this, the share company has planned to open specialty centers, advanced diagnostic centers, health centers, pharmacies, specialized comprehensive teaching hospital, general hospitals, pharmaceutical industry, medical equipment maintenance, import and distribution centers and, health science colleges. To fulfill the vision of WALIIF Health Care S.C, WHSBC has planned to produce highly qualified health professionals in

pharmacy, medical laboratory, Nursing, Radiology and anesthesia and Public Health Officer programs, in its short-term plan, where it has long term plan of opening medical schools, business program and MPH programs. WHSBC aspires to be a Centre of Excellence in the area of Education, Research and community service. It is an overwhelming health science and Business College in that it provides trainings of international quality, incorporates English language competency and character development training in all its programs.

## **2.Rationale**

Currently with the aim of producing competent and capable graduates to address the current social and economic dynamics, there is an initiation to integrate and modularize the existing curricula for all undergraduate programs throughout the country. Even though the existing curriculum is modularized, the courses are not organized based on competences rather related courses are clustered as a module. As a result, students who drop out from universities are not recognized for the module they successfully accomplished. In general, modularization is believed to maintain the uniformity of training, curriculum flexibility, and student mobility across the higher education institutions. It also strengthens the relationship between the world of education and the world of work. Therefore, development of new, integrated, and harmonized modular curriculum is required to cope up with new technologies and modern ideas.

## **3.Objective**

### **3.1. General Objective**

- The aim of this program is to produce BSc level Medical Laboratory Science Practitioners capable of providing quality, comprehensive and evidence based medical laboratory services.

### **3.2. Specific Objectives**

The specific objectives of Generic Medical Laboratory Science program are to train:

- Qualified medical laboratory science practitioners to work in health institutions, higher institutions, research institutions and industries.
- Graduates capable of developing and promoting the medical laboratory profession for human good.
- Competent medical laboratory science practitioners to meet the human power needs of

various health and health related institutions.

- Graduates equipped with skills to utilize classical and advanced laboratory techniques in clinical diagnosis of human disease (in both clinical and public health laboratory settings).
- Graduates who can test and analyze tissue, blood, and other biological specimens collected for the purposes of criminal and other legal investigations.
- Graduates who can participate in identifying and solving the community problems in various health perspectives.
- Graduates with managerial, supervisory and quality assurance responsibility.
- Competent practitioners who can maintain the professional code of ethics.

## **4. Program Domains and Competencies**

### **4.1. Professionalism and Ethical Conduct**

**Description:** Medical Laboratory Science professionals shall maintain the medical laboratory ethical code of conduct standards and contribute to the stewardship of their profession. The professionals will also participate in policy, professional standards, and continuing professional development issues pertaining to the medical laboratory profession. They will establish interpersonal relationships, apply principles of ethics; exercise, duties and responsibilities of medical laboratory professionals, and maintain patients' bill of rights. Moreover, these professionals will deliver medical laboratory services in a respectful, compassionate and caring manner to patients and other clients. Graduates of this program will have the following competencies:

- Apply medical laboratory ethical code of conduct and contribute to the stewardship of their profession.
- Implement laboratory standard operating procedures while performing tests.
- Value compassionate, respectful, and caring behavior at the individual and family level.

## 4.2. Medical laboratory science practice

**Description:** Medical laboratory professionals perform different laboratory tests which play an important role in the detection, diagnosis, and treatment of diseases. Medical laboratory professionals are capable of patient identification, proper specimen collection, handling, processing and storage skills for onsite analysis and sample referral. They are multi-skilled health care providers who perform various tests for different diagnostic purposes and generate data on blood, urine, body fluids and other specimens through the use of precise methodologies and automated technologies.

Graduates of this program will have the following competencies:

- 4.2.1. Identify the chemical characteristics of different chemical compounds and solutions.
- 4.2.2. Prepare stock and working laboratory solution of different concentrations.
- 4.2.3. Identify appropriate anatomic sites for biological sample collection.
- 4.2.4. Identify structure, functions and biochemical contents of cells and organs
- 4.2.5. Perform patient identification, proper specimen collection, handling, processing and storage for onsite analysis and sample referral as per standard operating procedure.
- 4.2.6. Perform molecular tests on clinical specimens as per standard operating procedure.
- 4.2.7. Perform immunological assays on clinical specimens as per standard operating procedure.
- 4.2.8. Perform serological assays on clinical specimens as per standard operating procedure.
- 4.2.9. Perform parasitological tests as per standard operating procedure.
- 4.2.10. Identify public health important vectors and apply integrated vector control strategies.
- 4.2.11. Perform hematological tests on clinical specimens as per standard operating procedure.
- 4.2.12. Perform immunohematology tests on clinical specimens as per standard operating procedure.
- 4.2.13. Perform histopathological techniques on tissue specimen for histopathological investigation.
- 4.2.14. Perform bacteriological tests on clinical specimens as per standard operating procedure.
- 4.2.15. Perform virological tests on clinical specimens as per standard operating procedure.

- 4.2.16. Perform Mycological tests on clinical specimens as per standard operating procedure.
- 4.2.17. Perform clinical chemistry tests on clinical specimens as per standard operating procedure.
- 4.2.18. Perform Urine and body fluid analysis as per standard operating procedure.
- 4.2.19. Perform toxin analysis using different methods and instruments following standard operating procedure.
- 4.2.20. Use automated equipment and instruments capable of performing a number of tests simultaneously.
- 4.2.21. Interpret, report, and document laboratory test results correctly

#### **4.3. Public Health Laboratory Practice**

**Description:** Medical laboratory professionals will involve in outbreak investigation and microbiological analysis of food, water, and beverages. They will collect and analyze biological and environmental samples for the purpose of an outbreak investigation, surveillance, and prevention and control of communicable diseases.

Graduates of this program will have the following competencies:

- Perform specimen collection, processing, transport, storage, and analysis during disease outbreak and surveillance according to standard operating procedure.
- Collect, process, transport, store and analyze food, water, beverages and other environmental samples for communicable disease prevention and control as per the standard operating procedures.
- Interpret, report, and document public health laboratory test results correctly.

#### **4.4. Laboratory Quality Assurance and Safety Practice**

**Description:** Medical Laboratory Science professionals evaluate test results, develop and modify procedures and implement standard laboratory practices to ensure quality test results and promote safety. They involve in planning and execution of internal and external laboratory quality assurance. Monitor and maintain proper functioning of



medical laboratory equipment/reagents. Collect, document, retrieve and interpret laboratory data. Assure a safe working environment and manage common accidents in the laboratory. Graduates of this program will have the following competencies:

- Apply computer skills for data storage, analysis and report generation.
- Evaluate test results and methods; develop and update standard operating procedures to ensure the accuracy of tests.
- Design and implement quality enhancement plan to ensure the delivery of quality laboratory services.
- Promote and apply laboratory safety practices and standard operating procedures.
- Manage common accidents in the laboratory.
- Apply international medical laboratory quality standards.
- Confirm and verify laboratory test results through in-depth knowledge of scientific methods, principles and instrumentation theory.
- Monitor and maintain proper functioning of medical laboratory equipment and reagents.

#### **4.5. Research and Education**

**Description:** Medical laboratory Science Professionals assist, participate and conduct operational and basic research, and involve in the development of new medical laboratory diagnostic technologies. They participate in teaching at higher education institutions, training of laboratory workforce and engage in continuous professional development. Graduates of this program will have the following competencies:

- Design and conduct problem solving operational and basic research projects.
- Analyze the occurrence of disease and health events in terms of place, time and person.
- Participate in teaching at higher education institutions.
- Train laboratory workforce and engage in continuous professional

development.

#### **4.6. Leadership and Management**

**Description:** Medical laboratory professionals shall participate in Leadership, Management and Governance of the health care system in general and medical laboratory programs in particular. They involve in planning, directing and supervising medical laboratory personnel, laboratory supplies, equipment and financial resources required to run medical laboratories in the health care system. Graduates of this program will have the following competencies:

- Supervise medical laboratory personnel.
- Participate in Leadership, Management and Governance of the health care system in general and medical laboratory in particular.
- Setup specification for laboratory equipment and other related logistics.
- Demonstrate the ability to create a health care system that can provide compassionate, respectful and caring service.

#### **4.7. Communication and Collaboration**

**Description:** Medical Laboratory Professionals shall communicate effectively with the health workforce both verbally and in writing to improve the health care system. Involve in health promotion activities in the community and advocate the proper use of laboratory tests. Graduates of this program will have the following competencies:

- Advocate proper use of laboratory tests.
- Demonstrate effective verbal and written communication with client and clients' family.
- Work in harmony with the health care workforce and stakeholders.
- Provide health Information to communities and clients.
- Design and apply appropriate intervention for psychological, social, and

environmental determinants of health

#### **4.8. Public Health and management of information:**

**Description:** refers to understanding the social determinants of health to protect and promote the health of population and understanding the principles of health systems organization for efficient and effective management of the health care system. They are also expected to manage and use information for medical problem solving and decision-making. At the completion of medical laboratory education, the graduate is expected to:

- Analyze important life-style, nutritional, genetic, demographic, environmental, social, economic, psychological and cultural determinants of health.
- Take appropriate action in disease, injury and accident prevention and promoting the health of individuals, families and communities,
- Analyze global and national trends in morbidity and mortality of diseases of public health significance,
- Analyze impact of migration and environmental factors on health and the role of international health organizations
- Apply the basic principles of communicable disease control in hospital and community settings
- Measure population health, risk factors and its determinants
- Manage and interpret health and health related data at population level
- Use national, regional and local surveillance data as well as demography and epidemiology in health decisions, management of epidemics and disaster preparedness plan and management.
- Create and maintain accurate, legible and complete community health records
- Generate data from laboratory investigations to diagnose and treat diseases and assess general health at the community level

- Search, collect, organize and interpret health and biomedical information from different databases and other sources for solving problems and making decisions that are relevant to the care of individuals, population and health promotion
- Retrieve and use patient-specific information from a clinical laboratory data system maintaining confidentiality and protection of individual data
- Use information and communication technology to assist in diagnostic and preventive measures and for surveillance and monitoring health status.

#### **4. 9. Involve in laboratory instrumentation**

**Description:** refers to understand and describes the principle, instruction to use and applications of different laboratory instruments; classification of laboratory instruments; handling of laboratory instrumentation; apply operating procedures, and application of different instruments in the laboratory by considering standard safety issue maintenance and troubleshooting of laboratory instruments.

#### **4.10. Engage in supply chain management**

**Description:** refers to understand the forecasting, product selection and procurement of laboratory equipment and supplies, quantification, inventory management, storage and distribution of laboratory equipment and supplies.

### **5. Professional Profile**

- Medical laboratory professionals are equipped with ethical communication skill, maintain patient confidentiality and privacy.
- Medical laboratory professionals are capable for patient identification and proper specimen collection skill.
- Medical laboratory professionals prepare specimens for examination, count cells and look for abnormal cells or findings.
- Medical laboratory professionals are multi-skilled health care providers who perform various tests for different diagnostic purposes.

- Medical laboratory professionals generate data on blood, urine, body fluids and other specimens through the use of precise methodologies and technologies, which help to diagnose and treat diseases and assess general health.
- Medical laboratory professionals work in hospital laboratories, health centers, in industrial medical laboratories, in pharmaceutical companies, and research programs.
- Medical laboratory professionals serve as faculty of higher training institutions preparing medical laboratory personnel.
- Medical laboratory professionals use automated equipment and instruments capable of performing a number of tests simultaneously, as well as microscopes, cell counters and other sophisticated laboratory equipment.
- Medical laboratory professionals analyze the results and relay them to physicians.
- Medical laboratory professionals perform an assay of complex chemical, hematological, immunological, parasitological, virological, fungal, bacteriological, molecular tests.
- Medical laboratory professionals analyze samples for chemical content or a chemical reaction in various specimens.
- Medical laboratory professionals evaluate test results, develop and modify procedures, and establish and monitor programs to ensure the accuracy of tests.
- Medical laboratory professionals direct and supervise medical laboratory technicians.
- Medical laboratory professionals work in harmony with other professionals and stakeholders
- Medical laboratory professionals participate in leadership, management and governance of the health care system in general.
- Medical laboratory professionals participate in designing and implementation of quality enhancement plan to ensure the delivery of quality laboratory services.
- Medical laboratory professionals should participate in development of national policies related to medical laboratory science.

- Medical laboratory professionals participate in planning, directing, and supervising medical laboratory personnel, laboratory supplies, equipment, and financial resources required to run medical laboratory services in the health care system.

## **6. Graduate Profile**

A student who has successfully completed the B.Sc. in Medical Laboratory Sciences Education will be able to apply his/her knowledge, skills, and attitudes as follows:

### **Knowledge**

- Understand management, policies, principles and procedures of the medical laboratory sciences
  - Use his/her critical thinking to improve the laboratory-working environment
  - Familiarize him/herself with latest scientific findings to improve the quality of medical/ clinical laboratory services rendered to the society.
  - Recognize and interpret laboratory findings and correlate with common disease pathogenesis
- Identify factors that affect procedures and test results, and suggest appropriate action within predetermined limits.
  - Recognize ways of surveillance of communicable diseases
  - Confirm and verify results through an in-depth knowledge of scientific methods, principles and instrumentation theory.
  - Recognize laboratory logistic procurement, evaluation, setup specification and equipment auditing .
    - Understand international Medical/Clinical laboratory quality standards
  - Understand pathogenesis and diagnostic principles and methods of bacterial, viral, fungal and parasitic diseases.

- Recognize the physiological and pathological conditions which may affect the biochemical and hematological parameters.
- List factors that influence down time of lab instruments-based SOP
- Explain the principle of radioactive detection and safety issues according to SOP
- Identify the operating procedures of micropipettes, spectrophotometer, electrophoresis, chromatography, cell counting automation and electrochemical techniques.
- Understand the definitions and principles of related to supply chain management
- Acquire understanding and knowledge of project management skills, centralized procurement and tracking of supplies and logistics
- Understand the supply chain management and logistics system
- Understand the process of supply chain management
- Understand importance and role of supplier and vendor in supply chain management
- Describe cost accounting, financial statements, and bidding process in procurement
- Acquire cost-to-serve understanding
- Understand the technical requirements, cross-cultural and global business and financial issues in supply chain management
- Understand information technology, automation knowledge, electronic business and electronic purchases, catalogue reading and product searching
- Define criteria for supplies or materials to be purchased
- Consider the advantages and disadvantages of purchasing “brand name” compared to “generic” products

- Understand business ethics and understand any local or national government requirements that need to be accommodated in the contracts
- Know supply chain management troubleshooting and problem solving, and understand supplier relationship management

### **Attitude**

- Maintain the medical laboratory ethical code of conduct standards and contribute to stewardship of their profession
- Adhere to Laboratory standard operative procedures while performing tests
- Advocate the proper use of laboratory tests.
- Promote safety, quality control and quality assurance in clinical and public health laboratories
- Participate in policy, professional standards, continuing professional development issues pertaining to medical laboratory profession
- Respectful, compassionate and caring to patients, their relatives and other professionals
- Practice constant learning and thorough understanding
- Develop good working network and integrate multiple systems
- Adhere and follow standards for quantification, inventory management, storage and distribution of laboratory equipment and supplies
- Adhere and follow standard products specification
- Aspire accreditation as important as service delivery

### **Skill**

Perform routine and advanced biochemical, bacteriological, virological, mycological, parasitological, hematological, immunologic, and molecular tests, on clinical, environmental, drugs, toxins and specimens of public importance.



- Participate and contribute in surveillance and control of communicable disease and information dissemination in diseases outbreak situations.
- Assist, participate and conduct operational and basic research and involve in development of new medical laboratory diagnostic technologies.
- Establish and monitor programs to ensure the accuracy of tests.
- Plan and monitor laboratory logistic procurement, evaluation, setup, auditing and safe disposal
- Provide professional services, leadership and quality assurance in clinical/public health laboratories
- Monitor and maintain proper functioning of medical laboratory equipment/reagents
- Supervise medical laboratory staff.
- Develop, evaluate and update laboratory standard operational procedures.
- Demonstrate leadership and management skills in health/research institutions
- Engage in policy, professional standards, and continuing professional development issues pertaining to medical laboratory profession.
- Collect, preserve, store and transport referral specimens for proper and safe testing
- Communicate effectively both verbally and non-verbally.
- Collect, document, retrieve and interpret laboratory data clearly and safely.
- Forecast laboratory supplies and equipment for procurement
- Undergo method selection process and prepare acceptance criteria for supplies and equipment after procurement
- Review all contracts to make sure the laboratory's requirements are being met.
- Prepare specification and undergo item selection process for purchase
- Engage in preparation of contractual agreement and legal frame work

- Determine how payments will be made, and how the vendor will assure reliable availability and delivery of supplies and reagents.
- Follow-up the logistics system

## 7. Program Profile

S. No	Program profile	Numbers
1	Total Credit hours/ EtCTS	178 Cr. Hrs (289 ECTS)
2	Number of Modules	46
3	<b>Category of Modules</b>	
	General	15
	Supportive	10
	Core	21

## 8. Admission Requirements

To be admitted to the regular Program, candidates must:

- Meet the set criteria of the Ministry of Education for degree students to join higher learning institution.
- Satisfy the academic rules and regulations of the college.
- Present diploma in Medical Laboratory Technician/Technology/Sciences who meet the admission criteria set by the college.
- Diploma/advanced diploma/ level IV graduates in Medical Laboratory Sciences, passed certificate of competency (COC) exam and able to pass entry exam of the teaching college.
- Be physically and mentally healthy and fit to the program.
  - Applicants with minor physical problems that would not hinder effective training should be considered in to the school

- However, any student with any visual problem and any problem in manipulation of laboratory equipment's using his/her both hands should not be selected to join the school.

**Duration of study:** 4 years

**Module Delivery:** Year based except first year which is semester-based delivery (mixed approach). The modules would be delivered in parallel, but for some modules it could be block based delivery as needed.

### **Teaching – Learning Methods and Materials**

The following instructional methods will be used as strategies for the execution of this program:

**Interactive Lecture:** Lectures can be made interactive by enhancing them with engagement of learners mentally and physically using questions, brainstorming, discussion, think-pair-share, debate, role play, case study, providing opportunities for reading, talking, listening, writing and reflecting, and other learner activities.

**Case Study:** Case studies present realistic scenarios/situations that focus on a specific issue or problem, which may be related to diagnosis or treatment of patients, interpersonal skills or any of a wide range of managerial or organizational problems. Learners typically read, study and react to the case study individually or in small groups. Case studies are important to teach higher order knowledge objectives (application, analysis and synthesis) and critical thinking skills.

**Case Based Discussion (CBD):** is a structured interview conducted by a supervisor and a trainee in a focused manner around the actual written case records a trainee presents. It is a process which has both a grading element and a feedback function. Generally, the trainee will select some cases and should give the necessary records prior

to the case discussion. The trainee should be guided to choose cases in which uncertainty or where a conflict of decision making has arisen. In practical terms, it is helpful for the supervisor to be familiar with the competencies being assessed using assessment tools or check lists.

**Simulated Practice (Medical Laboratory skills lab):** Simulated practice is the use of simulated person, device or set of conditions for instructional purpose. The learner is required to respond to the situation as he or she would under natural circumstances. Simulation takes various forms. Simulation can be static (like using anatomical models that closely resemble the human body or parts of it) or automated using advanced computer technology. Some are individual, prompting solitary performance, or interactive, involving groups of people. In medical education, simulation complements patient-based education and is best employed to prepare learners for real patient contact. It allows them to practice and acquire patient care skills in a controlled, safe and forgiving environment. Simulations are used to develop psychomotor, procedural and clinical decision-making skills. Simulation also aids development of communication and teamwork skills as well as the ability to respond to medical emergencies systematically. Simulated teaching facilitates learning under the right conditions including, but not limited to, learners receiving feedback on their performance, learners having the opportunity for repetitive practice and simulation being an integral part of the curriculum.

**Role Play:** In a role play, learners play out different roles or parts-such as of a patient and provider-in a simulated situation. Role play addresses knowledge, skills and attitude objectives. Role plays promote learning through behavior modeling, observation, feedback, analysis and conceptualization. They are also often useful for exploring, discussing and influencing behaviors and attitudes of learners, as well as for helping learners develop communication and counseling. It is also useful for teaching management and supervision skills.

**Laboratory Practicum:** is the use of client experiences to develop and practice

knowledge, skills and attitude required for medical laboratory services under the supervision of a skilled laboratory instructor or preceptor. Learning opportunities include placements at a variety of medical laboratories. Medical laboratory teaching and learning uses a variety of techniques including observation, demonstration, role-modeling, practice, coaching, feedback, discussion and reflection.

**Literature Reviewed Seminar:** A seminar is one of the most modern and advanced teaching methods where a group of students are guided to interact with each other on a given theme/ topic. This method motivates participants by actively involving them in the presentation and in the later discussion. Participants develop their questioning skills in a seminar, and they also need to learn to debate with arguments. For the presenter, a deep learning is achieved through the preparation, presentation, and defending of his/her arguments. The participants also learn good communication skills and learn to be open-minded to different ideas. In general, the seminar method encourages active participation from the participants and facilitating deep learning.

**Research and Reflection:** In this methodology the student selects content area from list of topics provided (e.g., examine the impact of culture on the delivery of health care) then use journals, self- reflection, community-based research, clinical experiences, discussions etc., and is expected to present the findings (in writing and /or orally). This will help the student apply literature review, self-reflection and critical thinking as a method of professional exploration and growth to enhance their research and communication skill and deepen and broaden their knowledge.

**Tutorial:** is a method of transferring knowledge and may be used as a part of a learning process. Tutorial activities aim at enabling students to learn in an individual or small group environment, developing their subject knowledge, and developing their effective learning and critical thinking skills. This involves a number of different activities: modeling appropriate learning behaviors, supporting and developing student subject

learning by introducing ideas and insights, questioning and probing students' responses, and focusing the discussions on critical concepts, principles and skills. This includes creating a friendly, informal environment necessary for successful academic learning, as well as acknowledging students' contributions and promoting collaborative work. Tutors also have a managerial role in setting the agenda and planning the tutoring sessions. This includes a variety of tasks such as introducing the learning group, establishing the expected outcomes, introducing and setting tasks, focusing and re-focusing the discussions, setting the pace and managing the time, summarizing the outcomes, closing the discussions or conferences.

**Community Based Training Program (CBTP):** is one of the community-based educational programs that aims to give students the skills they need to evaluate, identify, and address priority community health issues. In this educational style, pupils actively participate in their own learning.

**Team Training Program (TTP):** is a problem-solving-based, community-based learning activity that involves all students in site selection, mapping, the creation of investigation tools for gathering data, processing and analyzing that data, listing and prioritizing problems, creating plans of action, implementing interventions, and conducting follow-up and evaluation work. Students from the Medical Laboratory, Nursing, and Pharmacy departments will work together as a team in the neighboring training medical facilities during their final year.

The program aims

- Enable students to apply and integrate their knowledge and abilities with their team members and service providers.
- Enable students to work as a member of a health team in addressing health problems in a community.
- To provide students with a chance to gain first-hand experience and exposure to real-life situations.

This program needs materials such as text and reference books, lecture notes, laboratories with chemicals, reagents and equipment, learning guides, audiovisual materials, computers, and other supplementary materials as found necessary.

## **9. Assessment Methods**

The techniques, procedures, instruments, and equipment used in assessment methods are those that help identify how well students are demonstrating desired academic goals. Assessment will motivate students to learn, creates learning opportunities, gives feedback to students, enable teachers evaluate their teaching approach, used for quality assurance.

In planning assessment, it is necessary to use the variety of methods available to assess students' learning outcome.

**Formative assessment:** represents a number of techniques that teachers employ to assess students' understanding, learning needs, and academic achievement as they proceed through a lesson, unit, or module. The goal of formative assessment is to monitor student learning to provide ongoing feedback that can be used by instructors to improve their teaching and by students to improve their learning. More specifically, formative assessments: help students identify their strengths and weaknesses and target areas that need further work.

The following methods will be used for formative assessment on medical laboratory science education.

- Assignments, Laboratory reports, Oral exam, Tests, Quiz, Case study,
- Seminar, Logbook

**Summative Assessment:** are used to assess student learning, academic achievement, and skill development at the end of a specified instructional period. As a result, they are typically evaluative rather than diagnostic; they are better suited for assessing student

learning at the conclusion of an instructional unit by comparing it against some standard or benchmark, determining learning progress and achievement, assessing the efficacy of educational programs, measure progress toward improvement goals, or make module-placement decisions, among other possible applications.

**Written Examination:** written assessments may include different item formats such as multiple-choice questions, matching, true-false, essay and short answer. Written assessment methods will help to evaluate knowledge and understanding of basic, clinical, public health and psychosocial sciences and professionalism and ethics. Important point to remember is to ensure written exams assess higher order knowledge in addition to recall and comprehension. Written assessments would be parts of both as formative and summative assessment in all of the program modules.

**Objectively Structured Practical Examination (OSPE):** are objectively structured laboratory evaluations of a student while he/she is performing medical laboratory procedures in different settings.

The OSPEs offers students immediate and ongoing feedback about their observed general laboratory skill and performance.

## 10. Grading system

Letter grades shall be given based on the points earned out of 100. The letter grading system has a fixed scale as described in the table below.

Raw mark interval [100%]	Corresponding fixed number grade	Corresponding letter grade	Status Description	Class description
[90, 100]	4.0	A+	Excellent	First class with great distinction



[85, 89]	4.0	A	Excellent	First class with great distinction
[80, 84]	3.75	A <sup>-</sup>	Excellent	First class with great distinction
[75, 79]	3.5	B <sup>+</sup>	Very good	First class with distinction
[70, 74]	3.0	B	Very good	First class with distinction
[65, 69]	2.75	B <sup>-</sup>	Good	First class
[60, 64]	2.5	C <sup>+</sup>	Good	Second class
[50, 59]	2.0	C	Satisfactory	Second class
[45, 54]	1.75	C <sup>-</sup>	Unsatisfactory	Lower class
[40, 44]	1.0	D	Very poor	Lower class
[<40]	0	F	Fail	Lowest class

#### Promotion requirements

- Students are required to achieve a passing mark of C (50%) in knowledge based and C+ (60%) in performance assessments that will be conducted before their transition from one core modules to another core module and transition to internship program (pre-internship assessment) respectively.
- Any student scoring below 60% in core modules having hospital or community based clinical laboratory practice assessment should repeat the module.
- A student who scores C- or D in overall modular assessment of core modules will be allowed to take the next module/s while concurrently repeating the modules he/she scored C- or D.
- A failure (F) in the performance of the second attachment would suffice to delay the student by one year.
- Any student scoring below 50% in core modules in school-based assessment, including written exam, simulation-based assessment and PBL progressive assessment should take reexam in two weeks' period.

- Achieving at least 50% in overall school-based assessment is a requirement to join the modules' clinical laboratory practice.
- A student who scores C<sup>-</sup> in supportive and common courses could progress to take the next modules/semester/year given that his/her cumulative GPA is in acceptable range.
- A student who scores D in supportive course should take re-exam although he/she may have GPA of 2.0 or more. But for common courses, scoring D does not prohibit students to progress to the next level given that his/her GPA is in unacceptable range (as specified for 1<sup>st</sup> and 2<sup>nd</sup> year in the table above).
- A student with F in any of the modules/ courses must repeat the course/module as long as his/her cumulative GPA is in unacceptable range.
- A student should pass the pre-internship exam to attach the internships.
- A student should pass the comprehensive examination to take the national licensure examination.

## **11. Module policy**

### **Attendance**

- Students are expected to attend 100% of the lecture class. Students with tangible reason can be tolerated up to 20% absenteeism. It is mandatory for a student to attend 100% medical laboratory practice sessions.

### **Assignment:**

- On time assignment and seminar submission and/or presentation is mandatory.

### **Assessment: (test /quiz/presentation, exams, etc.):**

- If student miss any form of assessments without justifiable reason, no makeup will be given. Students are also required to adhere to the college's rules and regulations.
- Grading System: Criteria referenced fixed scale
- Remediation should be followed according to college policy

### **Cheating /plagiarism:**

- Students must do their own work and should not copy/give exam answers, assignments, research proposal, research reports, laboratory reports...etc from/to someone else.
- Inappropriate behavior will be dealt with according to the college's misconduct policy. Cheating in class is unethical. Anyone who is found cheating, the material will be confiscated and appropriate disciplinary action will be taken as per the college's rules and regulation.

### **Professional Behaviors**

- Adhere to time schedule
- Student should come with appropriate module materials during the lecture, laboratory and attachment sessions (handouts, laboratory manuals, laboratory reports.... etc.).
- During class desiccation, students are required to actively participate.
- If students are working in a group or with a partner, they should be a part of the group.
- Student should be efficient with their group work and home study time.
- Students should wear gown during the laboratory activities and never wear gown outside the laboratory.
- Students should display appropriate dressing and appearance (as per college students' dressing code)
- Students should adhere to laboratory safety rules and practice including appropriate dressing
- Students should not chew gum, eat, listen to and/or view materials from mobiles, iPod, etc., in class, laboratories and attachment sites.
- Students should not wear sunglasses, or talk about personal issues in class, laboratories and attachment sites.
- Students should turn off cell phones, pagers etc., before class, laboratories and exam sessions.
- Students should respect diversity and work as a team
- Any form of harassment is prohibited (to peer, teaching staff, clinical attachment site staff, patients, etc.)
- Theft and malicious destruction of properties are prohibited
- Use of drugs of abuse are prohibited

- All misconducts shall be handled as per the college legislation
- \*All rules and regulations of the College should be followed strictly.**

## **12. Requirement for Promotion**

- Promotion will be conducted every year as per the Waliif Health Science college rule and regulations.
- Promotion, Probation, and dismissal of students will be handled according to the college's legislation
- A student shall take remedial exam for only one module in a given year and three modules throughout his/her stay at the college/department.
- If a student has failure in any clinical laboratory attachment modules or laboratory internship, remedial exams will not be allowed and the student will be required to repeat the failed clinical laboratory attachments or internship.
- Any student who fails a remedial exam will repeat the modules.
- If a student fails again after the repeat and remedial exam, the student can repeat the failed modules or attachment and/or internship.
- A student who fails to pass the module or attachment/internship after repeating the module twice shall be managed as per the college's rules and regulations.

### 13. Graduation Requirement

Graduation requirement will be according to the university's rule and regulation. Thus, a student enrolled in the BSc Medical Laboratory Science program is eligible for graduation if and only if he/she:

- Has taken all the required modules for the program and obtained a minimum CGPA of 2.00
- Student should be able to pass comprehensive exam of the department/school, both in theory and practice before graduation.
- Has not scored "F" grade in any module, should not score less than "C" grade in any core module and should not score less than "C-" grade for any supportive module.
- A student shall score at least "C-" for any supportive modules
- Has carried out a student research project on a selected and agreed topic of research problem and scored a minimum of "C" grade in his/her thesis report.
- Pass successfully the comprehensive exam.
- 

The minimum passing mark for the Comprehensive exam (Internal plus external) is **50%**. If a student failed to score the above-mentioned result, he or she should be delayed for three months. During this period the student will be attached to hospital laboratories for further practice and/or be given an assignment and re-evaluated. The evaluation shall be consisted of hospital attachment evaluation (40%), written examination (40%) and oral examination (internal examination) (20%). This should be conducted until competency is ascertained.

### 14. Degree Nomenclature

The degree to be awarded to the students after completion of the program will bear the following name:

English version: **"Bachelor of Science Degree in Medical Laboratory Sciences"**

Amharic version: **"የሳይንስ ባችለር ዲግሪ በህክምና ላቦራቶሪ ሳይንስ"**

## 15.Resource Profile

In addition to Medical Laboratory Science professionals, and other members who specialized in the following fields are required: Hematology and Immunohematology, Medical Microbiology, Medical Parasitology, Immunology, Infectious and tropical disease, and Clinical Chemistry.

Sr. No	Educational level	Number
1	PhD	
2	PhD candidate	
3	MSc	2
4	MSc candidate	
5	BSc	1
6	Diploma	0

## 16.Quality Assurance

The authorized body in academic affairs for this program is the School Academic Council or Department Council. This body is responsible for the management and monitoring of the program. The following mechanisms will be employed to evaluate whether the modules offered in the program meet the standards or not.

- A module outlines according to the module content indicated in this catalog should be prepared for each module with time frame.
- The respective School/departments will evaluate the agreement between examination contents and the module outline.
- Health professionals from diverse field of study will comment on the curriculum in various ways.
- Recruitment of qualified staff.
- Implementation of continuous assessment (formative and summative)

- Periodic acquisition updated references, laboratory equipment and reagents
- Supervised practices in the training hospitals and health centers
- Periodic evaluation of the curriculum and the program in general
- External program evaluation by responsible regulatory bodies
- Additional quality assurance strategies designed by the school/department would also be employed as appropriate.
- Furthermore, there will be a periodic evaluation of the curriculum by using the feedback from the stakeholders/employers, graduates and students. Based on valuable feedbacks collected the curriculum will be revised accordingly.

### 17.Module profile

**Module name and Numbering:** The module name is directly or indirectly related to the content of the module and the identified competencies to be achieved by the respective modules.

- The first four/three letters in the module code represent program/department to which the module belongs to
- The last letter (M) represents the code is assigned for module code
- The first digit number represent level of students (years)
- The middle two digits represent module number
- The last digit represents category of the module (General = 1, Supportive = 2, Core = 3)  
Example: Module MeLS-M2111 (MeLS - Medical laboratory science, 2= the level of student (year 2), 11= Module number, 1= Category of the module which is general)

#### Module amount

Total modules to be taken = 46 (General = 15, Supportive = 10, Core = 21)

### 18.Program Modules

Year	Module Name	Module Code	Module Type	Module Credit	Module EtCTS	Delivery
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				hour		
<b>Year I</b>	Communicative English Language Skills I	FLEn1011	General	3	5	Parallel
	General Physics	Phys 1011	General	3 (2 +1)	5	Parallel
	General Psychology	Psch1011	General	3	5	Parallel
	Mathematics for Natural Sciences	Math1011	General	3	5	Parallel
	Critical Thinking	LoCT1011	General	3	5	Parallel
	Geography of Ethiopia and the Horn	GeES1011	General	3	5	Parallel
	Physical Fitness	SpSc1011	General	-	P/F	Parallel
	Communicative English Language Skills II	FLEn1012	General	3	5	Parallel
	Social Anthropology	Anth1012	General	2	3	Parallel
	General Biology	Biol1012	General	3 (2 +1)	5	Parallel
	Global Trend	GITr1012	General	2	3	Parallel
	Introduction to Emerging Technologies	EmTe1012	General	3	5	Parallel
	Moral and Civics Education	MCiE1012	General	2	3	Parallel
	General Chemistry	Chem1012	General	3	5	Parallel
	<b>Total</b>				<b>36</b>	<b>64</b>
<b>Year II</b>	Determinants of Health	SPH-M2152	Supportive	2	3	Parallel
	Chemistry	Chem-M2162	Supportive	6	10	Parallel



			e			
	Biomedical science	Biom-M2172	Supportive	9	15	Parallel
	Basic to Medical Laboratory Science	MeLS-M2183	Core	5	9	Parallel
	Applied Genetics and Molecular Biology	MeLS-M2193	Core	5	8	Parallel
	Medical Parasitology and Vector Biology	MeLS-M2203	Core	10	17	Parallel
	Hematology and Immunohematology	MeLS-M2213	Core	11	19	Parallel
	<b>Total</b>			<b>48</b>	<b>81</b>	
<b>Year III</b>	Immunology and Serology	MeLS-M3223	Core	6	10	Parallel
	Medical Bacteriology and Public Health Microbiology	MeLS-M3233	Core	10	17	Parallel
	Urine and Body Fluid Analysis	MeLS-M3243	Core	4	7	Parallel
	Basic Pharmacology	Phar-M3252	Supportive	3	5	Parallel
	Clinical chemistry and toxin analysis	MeLS-M3263	Core	10	17	Parallel
	Histopathology	MeLS-M3273	Core	3	5	Parallel
	Medical Virology	MeLS-M3283	Core	3	5	Parallel

	Instrumentation	MeLS-M3293	Core	2	3	Parallel
	Medical Mycology	MeLS-M3303	Core	2	3	Parallel
	Measurement of Health and Disease	SPH-M3312	Supportive	4	7	Parallel
	CBTP	PubH-M2091	Supportive	2	3	Block
	Clinical Laboratory Attachment I	MeLS-M3323	Core	3	5	Parallel/Block
	<b>Total</b>			<b>52</b>	<b>87</b>	
<b>Year IV</b>	Health promotion and disease prevention	SPH-M4332	Supportive	2	3	Parallel
	Health Informatics	Hinf-M4342	Supportive	2	3	Parallel
	Health Laboratory and supply chain management	MeLS-M4353	Core	3	5	Parallel
	Quality assurance in medical laboratory	MeLS-M4363	Core	2	3	Parallel
	Health service management and policy	SPH-M4372	Supportive	2	3	Parallel
	Research Methodology	SPH-M4382	Supportive	2	3	Block
	Student Research Proposal	MeLS-M3393	Core	1	2	Parallel
	Advanced and Research laboratory attachment	MeLS-M4403	Core	2	3	Block
	Clinical Laboratory	MeLS-M4413	Core	4	7	Parallel/Block

	Attachment II					Block	
	Entrepreneurship	ENps-M 4421	General	2	3	Block	
	Laboratory Internship	MeLS-M4433	Core	6	10	Block	
	Student Research project	MeLS-M4443	Core	2	3	Parallel	
	Comprehensive Examination	MeLS-M4463	Core	-	P/F	Block	
	<b>Total Year IV module credit hours</b>				<b>34</b>	<b>55</b>	
	<b>Total</b>				<b>166</b>	<b>269</b>	

#### Year IV Summer- Short Course trainings

Ser. No.	Short Course certificate trainings	Days	Mandatory/Optional
1.	Project management	8	Optional
2.	Statistical applications	4	Mandatory
3.	LQMS and safety	5	Mandatory
4.	Technical update trainings	7	Mandatory
5.	Entrepreneurship	3	Optional
	<b>Total</b>	<b>27 days</b>	

## **19. List of Medical Laboratory Sciences Module Syllabus**

Module Number	Module Code	Module Name	Module Type
1.	FLEn-M1011	Communicative English Language Skills I	General
2.	Phys-M1011	General Physics	General
3.	Psyc-M1011	General Psychology	General
4.	Math-M1011	Mathematics for Natural Sciences	General
5.	LoCT-M1011	Critical Thinking	General
6.	GeES-M1011	Geography of Ethiopia and the Horn	General
7.	SpSc-M1011	Physical Fitness	General
8.	FLEn-M1012	Communicative English Language Skill II	General
9.	Anth-M1012	Social Anthropology	General
10.	Biol-M1012	General Biology	General
11.	Econ-M1012	Economics	General
12.	EmTe-M1012	Introduction to Emerging Technologies	General
13.	MCiE-M1012	Moral and Civic Education	General
14.	Chem-M1012	General Chemistry	General
15.	SPH-M2152	Determinants of Health (SPH 1)	Supportive
16.	Chem-M2162	Chemistry	Supportive

17.	Biom-M2172	Biomedical Science	Supportive
18.	MeLS-M2183	Molecular Biology and Applied Genetics	Core
19.	MeLS-M2193	Basic to Medical Laboratory Science	Core
20.	MeLS-M2203	Immunology and Serology	Core
21.	MeLS-M2213	Medical Parasitology and Vector biology	Core
22.	MeLS- M2223	Clinical Laboratory Attachment I	Core
23.	SPH-M3232	Measurement of Health and Disease (SPH 2)	Supportive
24.	SNIE-M3241	Inclusiveness	General
25.	MeLS-M3253	Urine and Body Fluid Analysis	Core
26.	MeLS-M3263	Hematology and Immunohematology	Core
27.	SPH-M3272	Health Promotion and Disease Prevention (SPH 3)	Supportive
28.	MeLS-M3283	Histopathology	Core
29.	MeLS-M3293	Medical Bacteriology and Public Health Microbiology	Core
30.	MeLS-M3303	Medical Virology	Core

31.	MeLS-M3313	Medical Mycology	Core
32.	Phar-M3322	Basic Pharmacology	Supportive
33.	ComH-M3332	Community Based Training Program (CBTP)	Supportive
34.	MeLS- M3343	Clinical Laboratory Attachment II	Core
35.	MeLS-M4353	Clinical Chemistry and Toxin Analysis	Core
36.	GITr-M 4361	Global Trend	General
37.	MeLS-M4373	Quality Assurance in Medical Laboratory	Core
38.	MeLS-M4383	Health Laboratory and Supply Chain Management	Core

## **20. Description of the Modules**

### **20.1. Communicative English Language Skill I**

**Course code:** FLEn1011

**Cr. Hr (ECTS):** 5 ECTS

**Year:** I Semester I **Course objectives**

At the end of this course, students will be able to:

- Express themselves in social and academic events in English
- Use English intelligibly with reasonable level of accuracy and fluency
- Listen and comprehend to talks related to social and academic events given in English
- Read and understand texts written in English texts on academic and social matters
- Write in English as academically and socially desirable.
- Learn and develop their English on their own learning to learn: the language and the skills

#### **Course Description**

Communicative English Skills is a course designed to enable students to communicate in English intelligibly with acceptable accuracy, fluency and ability to use English appropriately in different contexts. The course exposes students to English language learning activities designed to help students use English for their academic and social needs. Students would be engaged in language learning development activities through doing and reflection on action. This includes grammar and vocabulary as used in communicative events and all skills and their sub-skills: speaking, listening, reading and writing. The language and skills are integrated where one becomes a resource to the other. There are six units covering topics related to the life world of students as well as of societal relevance.



Week	Study hour	Units Sections/Sub-sections	Role of students and teachers	Expected Learning Outcomes
	3hr	Unite 1: Introducing Oneself Section 1: Listening Activity one -Introducing oneself (who you are, where you came from, where you finished your primary and secondary school), what you intend to study and why	Students listen and take notes; use notes for class discussion. - Teacher introduces himself/herself. - Teacher facilitates that all students introduce themselves and engages students in group discussion where they ask more questions to their friends using the notes they took (speaking). - Teacher gives more input on introductions—use of language and style of introducing oneself. He/ She explains the grammar and vocabulary used in introductions mainly the simple present and simple past (Grammar), and lexical items that express actions can be given focus.	using English to introduce oneself -taking notes in English from the introductions listened to - interacting in English by asking more questions using the notes already taken
		Section 2: Reading Activity one - Reading a short biography written in		

		<p>simple English: using background knowledge, reading with comprehension, making notes while reading, guessing meanings, attending to reference words &amp; discussing notes, Activity two -Reading a short deductive essay: taking notes while reading, discussing notes, guessing meaning while reading, identifying descriptive words, using descriptive words in sentence writing</p>		
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**Prerequisite: None**

**Course Contents**

**20.2. General Physics**

**Module name:** General Physics

**Program:** BSc in Medical Laboratory Sciences

**Year:** I Semester I

<p>Course Goal (Learning outcome)</p>	<p>By the end of this course the student will able to:</p> <ul style="list-style-type: none"><li>• Develop knowledge and skills in basic measurement and uncertainty.</li><li>• Understand the basic concepts of physics and the relations between them (Laws).</li><li>• Describe and explain natural phenomena using the basic concepts and laws.</li><li>• Apply the basic concepts and laws to practical situations.</li><li>• Develop the algebraic skills needed to solve theoretical and practical problems.</li><li>• Appreciate the applicability of physics to a wide range of disciplines.</li></ul>
<p><b>Course Description</b></p>	<p>This algebra-based course provides science students with the basic concepts of physics that enable them to understand describe and explain natural phenomena. Emphasis is laid on general principles and fundamental concepts in measurements, mechanical and thermal interactions, fluid mechanics, electromagnetism, oscillations and waves with applications of physics in various fields of science.</p> <p>The course is organized into 7 chapters. The chapters on mechanics introduces the principles and laws governing the motion of objects and the interaction between them as well as conservation laws. The chapter on heat and temperature discusses the interaction between systems through energy transfer and describes some basic thermal properties of such systems. The chapters on oscillations, waves and optics provide basic concepts of periodic motions, how waves transfer energy from one place to the other, and use the concepts of light rays to explain image formation by mirrors and lenses. Electro-magnetism and electronics introduce the basic electric and magnetic phenomena using the concept of field and treats elementary concepts of semiconductors. Cross-cutting applications of physics explain the roles of physics in</p>

	Agriculture, Industries, Medicine, Archeology, Power Generation, Earth and Space Sciences.		
<b>Gerda Distribution</b>	Attendance and Class Participation		Students must attend above 80% of the lecture classes and 100% of Lab/Demonstration
	Demonstration/Lab work	15%	
	Quizzes/Assignments	5%	Department academic council will decide on missed Mid Exams.
	Mid Exam	30%	
	Neither late assignments nor late projects are allowed		
	Lecture, Tutorial, Seminar /Demonstration ...		

## 1.Lessen sequence plane

Chapter	Title	Detailed Content
1	Preliminaries (2 hrs.)	<ul style="list-style-type: none"> <li>✓ Physical Quantities and Units of Measurement</li> <li>✓ Uncertainty in Measurement and Significant Digits</li> <li>✓ Vectors: composition and resolution</li> <li>✓ Unit Vectors</li> </ul>
2	Kinematics & Dynamics of Particle (13Hrs.)	<ul style="list-style-type: none"> <li>✓ Kinematics in One and Two Dimensions (4hrs) <ul style="list-style-type: none"> <li>○ Displacement, Velocity and Acceleration in 1D and 2D</li> <li>○ Motion with Constant Acceleration</li> <li>○ Free Fall Motion</li> <li>○ Projectile motion</li> </ul> </li> <li>✓ Particle Dynamics and Planetary Motion (6hrs) <ul style="list-style-type: none"> <li>○ The Concept of Force as a Measure of Interaction</li> <li>○ Types of forces</li> <li>○ Newton's Laws of Motion and Applications</li> <li>○ Circular Motion</li> <li>○ Newton's Law of Universal Gravitation and Examples</li> <li>○ Kepler's laws, satellites motion and weightlessness</li> </ul> </li> <li>✓ Work, Energy and Linear Momentum (3hrs) <ul style="list-style-type: none"> <li>○ Work and Energy</li> <li>○ Linear Momentum</li> <li>○ Conservation of Energy and Linear Momentum /Collisions</li> <li>○ Power</li> <li>○ The Concept of Center of Mass</li> </ul> </li> </ul>
3	Fluids Mechanics (4 hrs.)	<ul style="list-style-type: none"> <li>✓ Properties of Bulk Matter /Stress, Strain/</li> <li>✓ Density and Pressure in Static Fluids</li> <li>✓ Buoyant Forces, Archimedes' principle</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Moving Fluids and Bernoulli's Equation</li> </ul>
<b>Mid Exam</b>		
4	Heat and Thermodynamics (5Hr)	<ul style="list-style-type: none"> <li>The Concept of Temperature: Zeroth Law of Thermodynamics</li> <li>✓ The Concept Heat and Work</li> <li>✓ Specific Heat and Latent Heat</li> <li>✓ Heat Transfer Mechanism</li> <li>✓ Thermal Expansion</li> <li>✓ Energy Conservation: First Law of Thermodynamics</li> </ul>
5	Oscillations, Waves and Optics (5 hrs.)	<ul style="list-style-type: none"> <li>✓ Simple Harmonic Motion</li> <li>✓ The Simple Pendulum</li> <li>✓ Wave and Its Characteristics</li> <li>✓ Resonance</li> <li>✓ Doppler Effect</li> <li>✓ Image formation by thin lenses and mirrors</li> </ul>
6	Electromagnetism and Electronics (6hrs)	<ul style="list-style-type: none"> <li>✓ Coulomb's Law and Electric Fields</li> <li>✓ Electric Potential</li> <li>✓ Current, Resistance and Ohm's Law</li> <li>✓ Electrical Power</li> <li>✓ Equivalent Resistance and Kirchhoff's Law</li> <li>✓ Magnetic Field and Magnetic Flux</li> <li>✓ Electromagnetic Induction</li> <li>✓ Insulators, Conductors, Semiconductors</li> <li>✓ Diodes / Characteristics Curve</li> <li>✓ Transistors</li> </ul>

7	Cross-Cutting Applications of Physics (4 hrs.)	<ul style="list-style-type: none"> <li>✓ Application in Agriculture <ul style="list-style-type: none"> <li>o Energy balance concept, energy balance in soils, moisture content, soil densities, soil moisture characteristics,</li> </ul> </li> <li>✓ Physics and Industries <ul style="list-style-type: none"> <li>o Principle of Motor and generator</li> </ul> </li> <li>✓ Physics in Health Sciences and Medical Imaging <ul style="list-style-type: none"> <li>o Radiation and its biological effect, x-ray, MRI, Ultrasound</li> </ul> </li> <li>✓ Physics and Archeology <ul style="list-style-type: none"> <li>o Radioactive Dating</li> </ul> </li> <li>✓ Application in Earth and Space Sciences <ul style="list-style-type: none"> <li>o Geothermal Energy, Seismometer, Radio and TV communications</li> </ul> </li> <li>✓ Application in Power Generation <ul style="list-style-type: none"> <li>o Solar and Wind Energy, Nuclear Power Plants, Hydroelectric power</li> </ul> </li> </ul>
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### **20.3. General Psychology**

**Program: Medical Laboratory Sciences**

**Year: I**

**Semester I**

1.1. Definition of Psychology and Related Concepts

1.2. Goals of Psychology

1.3. Historical Background and Major Perspectives in Psychology

1.3.1. Early schools of psychology

1.3.2. Modern schools of psychology

1.4. Branches/Sub Fields of Psychology

1.5. Research Methods in Psychology

#### **CHAPTER TWO: HUMAN DEVELOPMENT**

2.1. Basics of Human Development

2.2. Principles of Human Development

2.3. Aspects of Human Development

2.4. Theories of Human Development

2.4.1. Piaget 's theory of cognitive development

2.4.2. Freud 's psychosexual theories of development

2.4.3. Erikson 's theory of psychosocial development

2.4.4. Kohlberg 's theory of moral development

#### **CHAPTER THREE LEARNING, THEORYS OF LEARNING**

3.1. Definition, Characteristics and Principles of Learning

3.1.1. Definitions of learning

3.1.2. Characteristics of learning

3.1.3. Factors Influencing Learning.

3.2. Social Learning Theory (observational learning) theory

3.3. Cognitive Learning Theory

#### **CHAPTER FOURE: MEMMORY AND FORGETTING**



## 4.1 Memory

### 4.1.1 Meaning and Processes of Memory

### 4.1.2 Stages/Structure of Memory

### 4.1.3 Factors Affecting Memory

## 4.2 Forgetting

### 4.2.1 Meaning and Concepts of Forgetting

## **CHAPTER FIVE; MOTIVATION**

## 5.1. Motivation

### 5.1.1. Definition and types of motivation

### 5.1.2. Approaches to motivation (theories of motivation)

### 5.1.3. Conflict of motives and frustration

## 5.2. Emotions

### 5.2.1. Definition of emotion

### 5.2.2. Theories of emotion

## **CHAPTER SIX: PERSONALITY**

## 6.1. Meaning of Personality

## 6.2. Theories of Personality

### 6.2.1. The psychoanalytic theory of personality

### 6.2.2. The trait theory of personality

### 6.2.3. Humanistic theory of personality

## **CHAPTER SEVEN: PSYCHOLOGICAL DISORDERS AND TREATMENT TECHNIQUES**

## 7.1. Nature of Psychological Disorders

## 7.2. Causes of Psychological Disorders (Based on Perspectives)

### 7.2.1. The Biological Perspective

### 7.2.2. Psychological Perspectives

## 7.3. Types of Psychological Disorders

## 7.4 Treatment Techniques

## **CHAPTER EIGHT: INTRODUCTION TO LIFE SKILLS**

## 8.1. Nature and Definition of Life skills

## 8.2. Components of Life Skills

### 8.3. Goals of Life Skills

## CHAPTER NINE: INTRA-PERSONAL AND PERSONAL SKILLS

### 9.1. Self-Concept and Self-Awareness

9.2. Self-Esteem and self-confidence

9.3. Self-Control

9.4. Anger Management

9.5. Emotional Intelligence and Managing Emotion

9.6. Stress, Coping with Stress and Resilience

9.7. Critical and Creative Thinking

9.8. Problem Solving and Decision-Making

## CHAPTER TEN: ACADEMIC SKILLS

10.1. Time Management

10.2. Note-taking and Study Skills

10.3. Test-Taking Skill

10.4. Test Anxiety and Overcoming Test Anxiety

10.5. Goal Setting

10.6. Career Development Skill

## CHAPTER ELEVEN: SOCIAL SKILLS

### 11.1. Understanding cultural Diversity

11.2. Gender and Social Inclusion

11.3. Interpersonal Communication Skills

11.4. Social Influences

11.5. Peer Pressure

11.6. Assertiveness

11.7. Conflict and Conflict Resolution

11.8. Team Work

11.9. Overcoming Risky Behavior

## **20.4. Mathematics for Natural Sciences**

**Program: BSc in Medical Laboratory Sciences**

**Year: I**

**Semester I**

**Module code: Math-M1011**

**Module Weight: 5 ECTS**

**Course name: Mathematics for natural science**

### **Course Descriptions**

The course intends to prepare natural science students with the basic concepts and materials from mathematics that necessitate a good foundation to treat fundamental mathematical tools in science. This course rigorously discusses the basic concepts of logic and set theory, the real and complex number systems, mathematical induction, least upper bound and greatest lower bound, functions and types of functions, polynomial and rational functions, logarithmic and exponential functions, trigonometric functions, hyperbolic functions and their graphs and analytic geometry.

### **Course objectives:**

After completion of the course, students will be able to:

- ✓ apply propositional logic in reasoning,
- ✓ use quantifiers in open propositions in mathematical logic
- ✓ understand concepts of sets and set operations,
- ✓ understand the fundamental properties of real numbers use mathematical induction in proofs,
- ✓ analyze least upper bound and greatest lower bound,
- ✓ understand the fundamental properties of complex numbers
- ✓ express complex numbers in polar representation
  
- ✓ explain different types of functions, their inverses and their graphs evaluate zeros of polynomials
- ✓ Understand basic properties of logarithmic, exponential, hyperbolic, and trigonometric functions
- ✓ Understand basic concept of analytic geometry
- ✓ derive equations of conic sections

### **Chapter One: Propositional logic and Set Theory (14 hrs.)**

1.1. Definition and examples of proposition

1.1.1 Logical connectives

1.1.2 Compound (or complex) propositions

1.1.3 Tautology and contradiction

1.1.4 Open proposition and quantifiers

1.2. Set theory

1.2.1 The concept of a set

1.2.2 Description of sets

## **CHAPTER TWO THE REAL AND COMPLEX NUMBER SYSTEM (14 hrs.)**

2.1 The real number system

2.1.1. The natural numbers, Principle of mathematical induction and the Well ordering Principle

2.1.2. The integers, rational numbers and real numbers.

2.1.3. Upper bound and lower bound: least upper bound and greatest lower bound; Completeness property of real numbers

2.2. Complex number system

2.2.1. Definition of complex numbers and their operations

2.2.2. Polar representation of complex numbers and the De-Moi Vere's formula

2.2.3. Extraction of roots

## **CHAPTER THREE: Functions (14 hrs.)**

3.1. Review of relations and functions

3.2. Real-valued functions and their properties

3.3. Types of functions and inverse of a function

3.4. Polynomials, zeros of polynomials, rational functions, and their graphs

3.5. Definitions and basic properties of logarithmic, exponential, trigonometric and hyperbolic functions, and their graphs

## **CHAPTER FOUR: Analytic Geometry (22 hrs.)**

4.1 The straight-line: Division of segments and various forms of equation of a line.

4.2. Circles

4.2.1. Definition of circle and examples

4.2.2. Equation of a circle center at the origin and different from the origin.

4.2.3. Intersection of a circle and a line

4.3. Parabola

4.3.1. Definition of parabola and standard form of equation of parabola.

4.3.2. Equation of parabola parallel to the x-axis (the y-axis)

4.4. Ellipse

4.4.1. Definition of Ellipse and examples

4.4.2. Equation of ellipse center at the origin and different from the origin

4.5 Hyperbola

4.5.1. Definition of circle and examples

4.5.2. Equation of hyperbola of center at the origin transverse axis to x-axis (the y-axis)

Mode of delivery

- ✓ Lecture
- ✓ Group discussion
- ✓ Demonstration
- ✓ Problem solving

Assessment methods

- Assignments / quizzes / tests 20%
- Mid Exam 30%
- Final examination

## **Reference**

Abera Abay, An Introduction to Analytic Geometry, AAU, 1998

Alemayehu Haile and Yismaw Alemu, Mathematics an Introductory Course, Department of Mathematics, AAU.

## **20.5. Critical Thinking**

**Course Guide: Critical Thinking**

**School name: Medical Laboratory Sciences**

**Program: BSc. In Medical Laboratory Sciences**

**Module name:** Global affairs

**Year: I**

**Semester I**

**Module category:** General

**Module code:** Glaf-M4043

**Module Weight:** 30 ECTS

**Course name:** Critical thinking

**Course Code: LoCT1011**

**Module ECTS: 5**

**Module Duration:** 20 Weeks

### **CHAPTER ONE: Philosophy**

Lesson 1: Meaning and Nature of Philosophy

Lesson 2: Basic Features of Philosophy

Core Fields of Philosophy

Lesson 3: Metaphysics and Epistemology

3.1 Metaphysics

3.2 Epistemology

Lesson 4: Axiology and Logic

4.1 Axiology

4.2 Logic

Lesson 5: Importance of Learning Philosophy

### **CHAPTER TWO: BASIC CONCEPTS OF LOGIC**

Chapter Overview

Lesson 1: Basic Concepts of Logic: Arguments, Premises and Conclusions

Lesson 2: Techniques of Recognizing Arguments

2.1 Recognizing Argumentative Passages

2.2 Recognizing Non-argumentative Passages

Lesson 3: Types of Arguments: Deduction and Induction

3.1 Deductive Arguments

3.2 Inductive Arguments

3.3 Differentiating Deductive and Inductive Arguments Lesson

4: Evaluating Arguments

4.1 Evaluating Deductive Arguments: Validity, Truth, and Soundness

4.2 Evaluating Inductive Arguments: Strength, Truth, and Cogency

## **CHAPTER THREE: LOGIC AND LANGUAGE**

Chapter Overview

Lesson 1: Philosophy of Language: An overview

1.1 What is Philosophy of Language?

1.2 A Brief Note on the Debates and History of Philosophy of Language

1.3 Some Philosophical Approaches to the Nature of Meaning

Lesson 2: Logic and Meaning

2.1 The Functions of Language: Cognitive and Emotive Meanings

2.2 The Intension and Extension of Terms Logic and Definition

Lesson 3: Meaning, Types, and Purposes of Definitions

3.1 The Meaning of Definition

3.2 The Types and Purposes of Definitions

Lesson 4: Techniques of Definition

4.1 The Extensional (Denotative) Definitional Techniques

4.2 The Intentional (Connotative) Definitional Techniques

Lesson 5: Criteria for Lexical Definitions

## **CHAPTER FOUR: BASIC CONCEPTS OF CRITICAL THINKING**

Lesson 1: Meaning of Critical Thinking

Lesson 2: Standards of Critical Thinking

Lesson 3: Codes of Intellectual Conduct for Effective Discussion

3.1 Principles of Good Argument

3.2 Principles of Critical Thinking

Lesson 4: Characteristics of Critical Thinking

4.1 Basic Traits of Critical Thinkers

4.2 Basic Traits of Uncritical Thinkers

Lesson 5: Barriers to Critical Thinking

Lesson 6: Benefits of Critical Thinking

## **CHAPTER FIVE: INFORMAL FALLACIES**

Chapter Overview

Lesson 1: Fallacy in General

1.1 The Meaning of Fallacy

1.2 Types of Fallacies

Informal fallacies

Lesson 2: Fallacies of Relevance

Lesson 3: Fallacies of Weak Induction

Lesson 4: Fallacies of Presumption

Lesson 5: Fallacies of Ambiguity and Grammatical Analogy

5.1 Fallacies of Ambiguity

5.2 Fallacies of Grammatical Analogy

## **CHAPTER SIX: CATEGORICAL PROPOSITIONS**

Chapter Overview:

Lesson 1: General Introduction

1.1 Standard-Forms of Categorical Proposition

1.2 The Components of Categorical Propositions

Lesson 2: Attributes of Categorical Propositions: Quality, Quantity, and Distribution

Lesson 3: Venn Diagrams and the Modern Square of Opposition

3.1 Representing Categorical Propositions in Diagrams

3.2 Squares of Opposition: Traditional and Modern Squares of Opposition

3.3 The Traditional Square of Opposition

Lesson 4: Evaluating Immediate Inferences: Using Venn Diagrams and Square of Oppositions

4.1 Logical Operations: Conversion, Obversion, and Contraposition



## **20.6. Geography of Ethiopia and the Horn**

**Course Guide: Geography of Ethiopia and the Horn**

**Department name: Medical Laboratory Sciences**

**Program: BSc. In Medical Laboratory Sciences**

**Module name: Health promotion and disease control**

**Year: I**

**Semester I**

**Module category: General**

**Module code: Sosc-M1033**

**Module Weight: 30 ECTS**

**Course name:** Geography of Ethiopia and the Horn

**Course Code:** GeES-1011

**Pre-requisite:** None

**Module ECTS:** 5

### **CHAPTER ONE: INTRODUCTION**

1.1. Geography: Definition, Scope and Themes

1.1.1. Meaning of Geography

1.1.2. The Scope, Approaches and Themes of Geography

1.2. Location, Shape and Size of Ethiopia and the Horn

1.2.1. Location of Ethiopia

1.2.2. Size of Ethiopia

1.2.3. The shape of Ethiopia and its implication

1.3. Basic Skills of Map Reading

### **CHAPTER TWO: THE GEOLOGY OF ETHIOPIA AND THE HORN**

2.1. Introduction

2.2. The Geologic Processes: Endogenic and Exogenic Forces

2.3. The Geological Time scale and Age Dating Techniques

2.4. Geological Processes and the Resulting Landforms of Ethiopia and the Horn

2.4.1. The Precambrian Era geologic processes (4.5 billion - 600 million years ago)

2.4.2. The Paleozoic Era geologic processes (600million - 225 million years ago)

2.4.3. The Mesozoic Era geologic processes (225-70 million years ago)

2.4.4. The Cenozoic Era geologic processes (70million years ago - Present)

2.5. Rock and Mineral Resources of Ethiopia

2.5.1. Brief facts and current state of main minerals in Ethiopia

2.5.2. Mineral potential sites of Ethiopia

### **CHAPTER THREE: THE TOPOGRAPHY OF ETHIOPIA AND THE HORN**

3.1. Introduction

3.2. The Physiographic Divisions of Ethiopia

3.2.1. The western highlands and lowlands

3.2.2. The southeastern highlands and lowlands

3.2.3. The Rift Valley

3.3. The Impacts of Relief on Biophysical and Socioeconomic Conditions

### **CHAPTER FOUR: DRAINAGE SYSTEMS AND WATER RESOURCE OF ETHIOPIA AND THE HORN**

4.1. Introduction

4.2. Major Drainage System of Ethiopia

4.2.1. The western drainage system

4.2.2. The southeastern drainage system

4.2.3. The Rift Valley drainage system

4.3. Water Resources: Rivers, Lakes and Sub-Surface Water

4.3.1. The Ethiopian rivers

4.3.2. The Ethiopian lakes

4.3.3. Subsurface (ground) water resource of Ethiopia

4.4. Water Resources Potentials and Development in Ethiopia

### **CHAPTER FIVE: THE CLIMATE OF ETHIOPIA AND THE HORN**

5.1 Introduction

5.2. Elements and Controls of Weather and Climate

5.3. Spatiotemporal Patterns and Distribution of Temperature and Rainfall in Ethiopia

5.3.1 Spatiotemporal distribution of temperature

5.3.2. Spatiotemporal distribution of rainfall

5.4. Agro-ecological Zones of Ethiopia

## 5.5. Climate Change/Global Warming: Causes, Consequences and Response Mechanisms

### 5.5.1. Current Trends of Climate Change in Ethiopia

### 5.5.2. Causes of Climate Change

### 5.5.3. Consequences of Climate Change

### 5.5.4. Climate Response Mechanisms

## **CHAPTER SIX: SOILS, NATURAL VEGETATION AND WILDLIFE RESOURCES OF ETHIOPIA AND THE HORN**

### 6.1. Introduction

### 6.2. Ethiopian Soils: Types, Degradation and Conservation

#### 6.2.1. Introduction

#### 6.2.2. Major soil types in Ethiopia

#### 6.2.3. Soil degradation

#### 6.2.4. Soil erosion control measures

### 6.3. Natural Vegetation of Ethiopia

#### 6.3.1. Introduction

#### 6.3.2. Major vegetation types of Ethiopia

#### 6.3.3. Natural vegetation degradation

#### 6.3.4. Natural vegetation conservation

### 6.4. Wild Life/Wild Animals in Ethiopia

#### 6.4.1. Introduction

#### 6.4.2. Wildlife conservation

#### 6.4.3. Challenges of wild life conservation in Ethiopia

## **CHAPTER SEVEN: POPULATION OF ETHIOPIA AND THE HORN**

### 7.1. Introduction

### 7.2. Population Data: Uses and Sources

### 7.3. Population Dynamics: Fertility, Mortality and Migration

#### 7.3.1. Demographic Measurements

#### 7.3.2. Levels and trends in fertility and mortality rates in Ethiopia

#### 7.3.3. Migration in Ethiopia and the Horn

### 7.4. Age and Sex Structure of Ethiopian Population

### 7.5. Population Distribution in Ethiopia

#### 7.5.1. Measures of population distribution

7.5.2. Factors affecting population distribution in Ethiopia

7.6. Socio-cultural Aspects of Ethiopian Population: Education, Health and Languages

7.6.1. Education

7.6.2. Health

7.6.3. Languages families and languages of Ethiopia

7.7. Settlement Types and Patterns

7.7.1. Types of Settlement

7.7.2. Urban Settlements and Urbanization in Ethiopia

## **CHAPTER EIGHT: ECONOMIC ACTIVITIES IN ETHIOPIA**

8.1. Introduction

8.2. Mining Activity in Ethiopia

8.2.1. Introduction

8.2.2. Status of mining sector investment in Ethiopia

8.2.2. Importance of mining sector in Ethiopia

8.2.3. Environmental issues and management related to mining

8.3. Forestry

8.4. Fishery

8.4.1. Introduction

8.4.2. Fishing grounds in Ethiopia

8.4.3 Demand and consumption of fish

8.4.4. Constraints and opportunities of the fishing sector

8.5. Agriculture in Ethiopia

8.5.1. Introduction

8.5.2. Contributions, potentials and characteristics of agriculture in Ethiopia

8.5.3. Agriculture systems in Ethiopia

8.5.4. Major problems of Ethiopian agriculture

8.6. Manufacturing Industry in Ethiopia

8.6.1. Introduction

8.6.2. Types, characteristics of manufacturing

8.6.3. The spatial distribution of manufacturing industries in Ethiopia

8.6.4. Industrial development in Ethiopia: Challenges and opportunities

8.7. The Service Sector in Ethiopia

8.7.1. Introduction

8.7.2. Transportation and communication in Ethiopia: types, roles and characteristics

8.7.3. Trade in Ethiopia

8.5.3. Tourism in Ethiopia: Types, tourist attraction sites, challenges and prospects

## **20.7. Physical Fitness**

**Course Guide: Physical Fitness**

**Department name: Medical Laboratory Sciences**

**Program: BSc in Medical Laboratory Sciences**

**Module name: Natural Science**

**Year: I**

**Semester I**

**Module category: General**

**Module code: Nasc-M1023**

**Module number: 2**

**Module Weight: 30 ECTS**

**Course name: Physical fitness**

**Course code: SpSc-1011**

**Module ECTS: P/F**

**Module Duration: 20 Weeks**

**Unit 1: Concepts of physical fitness**

1.1. Meanings and definitions of terms

1.1.1. Physical fitness

1.1.2. Physical Activity

1.1.3. Physical exercise

1.1.4. Sport

1.2. General principles of fitness training

1.2.1 Principle of Overload

1.2.2 FIIT Principle

1.2.3 Principle of Rest, Recovery and Periodization

1.2.4 Principle of Reversibility

1.2.5 Principle of Individual Deference

**Unit 2: The Health Benefits of Physical Activity**

2.1. Physical Activity and Hypokinetic Diseases/Conditions

2.2. Physical Activity and Cardiovascular Diseases

2.2.1 coronary heart disease

2.2.2 Hypertension

2.2.3 Hyper-cholesterol Mia and Dyslipidemia

2.2.4 Diabetes Mellitus

2.2.5 Obesity and Overweight

2.2.6 Metabolic Syndrome

2.2.7 Aging

2.3. Physical activity and postural deformity

2.3.1 Musculoskeletal disease and disorders

### **Unit 3: Making Well-Informed Food Choices**

3.1. Sound Eating Practices

3.1.1 Macronutrients

3.1.2 Micronutrient

3.1.3 Calories (Food Energy)

3.2. Nutrition and Physical Performance

3.2.1 Nutrition Before Exercise

3.2.2 Nutrition during Exercise

3.2.3 Nutrition after Exercise

3.2.4 How to Plan Your Training Diet

### **Unit 4: Health related components of fitness and principles of exercise prescription**

4.1. Health Related Components of Fitness...

4.1.1 Cardiorespiratory Fitness

4.1.2 Muscle Fitness

4.1.3 Flexibility

4.1.4 Body Composition

4.2. Principles of exercise prescription for health and fitness

4.2.1 Fitness Goals

4.2.2 Mode of Exercise

4.2.3 Warm Up

4.2.4 Primary Conditioning Period: The Workout Plan

- 4.2.5 Cool –Down
- 4.3. Individualizing workout
- 4.4. Means and methods of developing cardiorespiratory fitness
  - 4.4.1 Exercise prescription for Cardiorespiratory Fitness
  - 4.4.2 Starting and Maintaining a Cardiorespiratory Fitness Program
  - 4.4.3 Training Techniques
- 4.5. Means and methods of developing muscle fitness
  - 4.5.1 Guiding Principles for Designing a Strength and Endurance Program
  - 4.5.2 Types of Weight Training Programs
  - 4.5.3 Exercise Prescription for Weight Training: an overview
  - 4.5.4 Developing an Individualized Exercise Prescription
- 4.6. Means and methods of developing flexibility
  - 4.6.1 Exercise Prescription for Improving Flexibility
  - 4.6.2 How to Avoid Hazardous Exercise

#### Unit 5: Assessment of fitness components

- 5.1. Evaluating Health Status
- 5.2. Assessment of cardiorespiratory fitness
  - 5.2.1 The 1.5 Mile Run Test
  - 5.2.2 1 Mile Walk Test
  - 5.2.3 The Cycle Ergometer Fitness Test
  - 5.2.4 The Step Test
- 5.3. Assessment of Muscle Fitness
  - 5.3.1. Assessing muscular strength
  - 5.3.2. Assessing muscular endurance
- 5.4. Assessment of flexibility
  - 5.4.1 Trunk Flexibility
  - 5.4.2 Shoulder Flexibility
- 5.5. Assessment of body composition
  - 5.5.1 The Skin Fold Test
  - 5.5.2 Estimation of Body Composition: Other Field Techniques

## **20.8. Communicative English Language Skill II**

**Department name: Medical Laboratory Sciences**

**Program: BSc in Medical Laboratory Sciences**

**Module name: English language skill**

**Year: I**

**Semester: II**

**Module category: General**

**Module code: FLEn-M1012**

**Module Weight: 33 ECTS**

### **Introduction to the Module**

Communicative English Language Skills II Module is a continuation of Communicative English I Module, and it mainly aims to provide first year college students proficiency with reading, speaking and writing skills. It also aims to help students learn vocabularies that are assumed unfamiliar to them. In the grammar part, with the intention of providing explanations, brief notes are given in each unit.

The module consists of five units with three supplementary reading at the end of the Module. The supplementary readings are included to support ideas included in the reading passages in units 1-3.

Students are advised to read the references put in the box for further learn the grammar points included in the Module.

Table of Contents

Unit I: Life Skills

Part I Reading passage: The concept of life skills

Part II Grammar: Active and passive voices

Part III Speaking

Part IV Writing

Unit II: Speculations about the future of science

Part I Reading passage: Grassroots attack in bilharzia Part II Grammar: Future Tense

Part III Speaking

Part IV: Writing



Unit III: Environmental protection

Part I Reading: Environmental Challenges: A river run through it

Part II Grammar: Modal verbs

Part III Speaking Part IV: Writing

Unit IV: Indigenous Knowledge

Part I Reading: A local Pathway to Global Development

Part II Grammar: Reported Speech

Part III Speaking Part IV: Writing

Unit V: Cultural Heritage

Part I Reading: Cultural Heritage

Part II Grammar: Relative Clauses

Part III Speaking

Part IV: Writing Supplementary Readings

A. Environmental Problems

B. The Origin of Humans: The Record from the Afar of Ethiopia

C. Tourism Can be Used to Preserve Ethiopia's Cultural and Historic Wealth

### **20.9. Social Anthropology**

**Course Guide: Social Anthropology**

**Department Name: Medical Laboratory Sciences**

**Program: BSc. In Medical Laboratory Sciences**

**Module name: Social science**

**Year: II**

**Semester II**

**Module category: General**

**Module code: Sosc-M1012**

**Module number: 4**

**Module Weight: 33 ECTS**

**Course name: Social anthropology**

**Course Code: Anth-1052**

**Pre-request none Course ECTS: 3**

Contents of the module: In addition to the above-mentioned themes, this module comprised the following contents: scope of anthropology, branches of anthropology, unique features of anthropology, and research methods in anthropology.

**Delivery Methods:** The teacher or course facilitator who is assigned to deliver is recommended to make use of different active learning methods including: brainstorming, question and answer, group discussion, buzz-group, cross-over, home-works, reading assignments, peer teaching, and seldom active lecturing.

**Modes of Assessment:** To assess the progress of student, the instructor/ the course facilitator is expected to employ a continuous assessment technique in the form of quizzes, group and individual assignments, take-home exam, final exam, term paper. The purpose of using various assessment techniques is to improve the process of students' learning.

**Module Learning Competencies:**

- Up on the successful completion of the course, students will be able to:
- Develop an understanding of the nature of anthropology and its broader scope in making sense of humanity in a global perspective
  - Understand the cultural and biological diversity of humanity and unity in diversity across the world and in Ethiopia;
- Analyze the problems of ethnocentrism against the backdrop of cultural relativism;
- Realize the socially constructed nature of identities & social categories such as gender, ethnicity, race and sexuality;
- Explore the various peoples and cultures of Ethiopia;
- Understand the social, cultural, political, religious& economic life of different ethno- linguistic & cultural groups of Ethiopia;
  
- Understand different forms marginalization and develop skills inclusiveness;
- Appreciate the customary systems of governance and conflict resolution institutions of the various peoples of Ethiopia;
- Know about values, norms and cultural practices that maintain society together;
- Recognize the culture area of peoples of Ethiopia and the forms of interaction developed over time among themselves; and
- Develop broader views and skills to deal with people from a wide variety of socio- economic and cultural backgrounds.

## **Unit One**

1. Introducing Anthropology and its Subject Matter
  - 1.1 Definition, Scope and Subject Matter of Anthropology
  - 1.2 Sub-fields of anthropology
  - 1.3 Unique (Basic) Features of Anthropology
  - 1.4 Misconceptions about anthropology
  - 1.5 The Relationship between Anthropology and Other Disciplines
  - 1.6 The Contributions of anthropology

## **Unit Two**

2. Human Culture and Ties that Connect
  - 2.1. Conceptualizing Culture: What Culture is and What Culture isn't
  - 2.2 Characteristic Features of Culture
  - 2.3 Aspects/Elements of Culture
  - 2.4 Cultural Unity and Variations: Universality, Generality and Particularity of Culture
  - 2.5. Evaluating Cultural Differences: Ethnocentrism, Cultural Relativism and Human Rights
  - 2.6 Culture Change
  - 2.7 Ties That Connect: Marriage, Family and Kinship

## **Unit-Three**

3. Human Diversity, Culture Areas and Contact in Ethiopia
  - 3.1. Human Beings & Being Human: What it is to be human?
  - 3.2 Origin of the Modern Human Species: Homo sapiens sapiens
  - 3.3 The Kinds of Humanity: human physical variation
  - 3.4 Human Races: the history of racial typing
  - 3.5 The Grand Illusion: Race, turns out, is arbitrary
  - 3.6. Why is Everyone Different? Human Cultural Diversity/Variation
  - 3.7. Culture area and cultural contact in Ethiopia
4. Marginalized, Minorities, and Vulnerable Groups
  - 4.1 Definition of concepts
  - 4.2 Gender-based marginalization Female genital cutting
  - 4.3 Marginalized occupational groups
  - 4.4 Age-based vulnerability

- 4.5. Religious and ethnic minorities
- 4.6. Human right approaches and inclusiveness: Anthropological perspectives
- 4.7. Unit Summary Unit Five
- 5. Identity, Inter-Ethnic Relations and Multiculturalism in Ethiopia Contents of the Unit:  
Unit learning outcomes:
  - 5.1. Identity, Ethnicity and Race: Identification and Social Categorization
  - 5.2. Conceptualizing Ethnicity –What’s it?
  - 5.3. Ethnic Groups and Ethnic Identity
  - 5.4. Race –The Social Construction of Racial Identity
  - 5.5. Theories of Ethnicity: Primordialism, Instrumentalism and Social Constructivism
    - 5.5.2. Instrumentalist (Situational) Theory of Ethnicity
  - 5.6. Unit Summary

## **Unit Six**

- 6. Customary and Local Governance Systems and Peace Making
  - 6.1 Indigenous and local governance
  - 6.2 Intra and inter-ethnic conflict resolution institutions
  - 6.3 Inter-ethnic conflict resolution
  - 6.4 Women’s role in conflict resolution and peacemaking
  - 6.5 Legal pluralism: interrelations between customary, religious and state legal systems
  - 6.6 Unit Summary Unit Seven
- 7. Indigenous Knowledge Systems (IKS) and Practices
  - 7.1. Definition of concepts
  - 7.2 Significance of indigenous knowledge
  
  - 7.3. Indigenous knowledge and development
  - 7.4. Preservation, Challenges and Limitations of IK
  - 7.5. The Erosion of Indigenous Knowledge Systems (IKS)

## **20.10. General Biology**

### **Course guide: General Biology**

**Department name: Medical Laboratory Sciences**

**Program: BSc in Medical Laboratory Sciences**

**Module name: natural science**

**Year: I**

**Semester II**

**Module category: General**

**Module code: Nasc-M1012**

**Module number: 2**

**Module Weight: 33 ECTS**

**Course name: General biology**

**Course code: Bioi-1021**

Module Objectives

At the end of the course, the students will be able to:

- Explain the scope of biology and molecular basis of life
- Describe life activities from the cellular point of view
- Manipulate basic biological tool, record data and draw conclusions
- Develop scientific attitude, skill and conduct biological experiments using scientific procedures
- Outline basic processes of energy transduction and synthesis of intermediate or final products in living cells
- Understand the basic concepts of genetics and inheritance
- Understand the concepts of infection and immunity
- Classify organisms based on their cellular organization and complexity. Hr (ECTS): 3 Cr Hr. (5 ECTS)
- Explain components, processes and interrelationships with in a given ecosystem
- Know the general features of invertebrate and vertebrate animals.

### **20.11. Economics**

## **21. Introduction to Emerging Technologies**

**Course Guide: Introduction to Emerging Technologies**

**Department name: Medical Laboratory Sciences**

**Program: BSc. In Medical Laboratory Sciences**

**Module name: Global affairs**

**Year: I**

**Semester II**

**Module category: General**

**Module code: Glaf-M1043**

**Module Weight: 33 ECTS**

**Course name: Introduction to Emerging Technologies**

**Course Code: EmTe1012**

**Pre-request none**

**Module ECTS: 5**

**Chapter 1: Introduction to Emerging Technologies**

1.1 Evolution of Technologies

1.1.1 Introduction to the Industrial Revolution (IR)

1.1.2 The Most Important Inventions of the Industrial Revolution

1.1.3 Historical Background (IR 1.0, IR 2.0, IR 3.0)

1.2 Role of Data for Emerging Technologies

1.3 Enabling devices and network (Programmable devices)

1.3.1 List of some Programmable devices

1.4 Human to Machine Interaction

1.4.1 Disciplines Contributing to Human-Computer Interaction (HCI)

1.5 Future Trends in Emerging Technologies

1.5.1 Emerging technology trends in 2019

1.5.2 Some emerging technologies that will shape the future of you and your business

**Chapter 2: Data Science**

2.1. An Overview of Data Science

2.1.1. What are data and information?

2.1.2. Data Processing Cycle

2.3 Data types and their representation

2.3.1. Data types from Computer programming perspective

2.3.2. Data types from Data Analytics perspective

2.4. Data value Chain

2.4.1. Data Acquisition

2.4.2. Data Analysis

2.4.3. Data Curation

2.4.4. Data Storage

2.4.5. Data Usage

## 2.5. Basic concepts of big data

### 2.5.1. What Is Big Data

### 2.5.2. Clustered Computing and Hadoop Ecosystem

#### 2.5.2.1. Clustered Computing

#### 2.5.2.2. Hadoop and its Ecosystem

### 2.5.3. Big Data Life Cycle with Hadoop

## **Chapter 3: Artificial Intelligence (AI)**

### 3.1. What is Artificial Intelligence (AI)

#### 3.1.1. Need for Artificial Intelligence

#### 3.1.2. Goals of Artificial Intelligence

#### 3.1.3. What Comprises to Artificial Intelligence?

#### 3.1.4. Advantages of Artificial Intelligence

#### 3.1.5. Disadvantages of Artificial Intelligence

### 3.2. History of AI

### 3.3. Levels of AI

### 3.4. Types of AI

#### 3.4.1. How humans think

#### 3.4.2. Mapping human thinking to artificial intelligence component

### 3.5. Influencers of artificial intelligence

#### 3.5.1. Big Data

#### 3.5.2. Cloud computing and application programming interfaces

#### 3.5.3. The emergence of data science

### 3.6. Applications of AI

### 3.7. AI tools and platforms

### 3.8. Semple AI application

## **Chapter 4: Internet of Things (IoT)**

### 4.1. Overview of IoT

#### 4.1.1. What is IoT?

#### 4.1.2. History of IoT

#### 4.1.3. IoT – Advantages

#### 4.1.4. IoT – Disadvantages

4.1.5. Challenges of IoT

4.2. How does it work?

4.2.1. Architecture of IoT

4.2.2. Devices and Networks

4.3. IoT Tools and Platforms

4.3.1. IoT Based Smart Home

4.3.2. IoT Based Smart City

4.3.3. IoT Based Smart Farming

## **Chapter 5: Augmented Reality (AR)**

5.1. Overview of augmented reality

5.2. Virtual reality (VR), Augmented Reality (AR) vs Mixed reality (MR)

5.2.1. Virtual Reality (VR)

5.2.2. Augmented Reality (AR)

5.2.3. Mixed Reality (MR)

5.3. The architecture of AR Systems

5.4. Applications of AR Systems

5.4.1. AR In education

5.4.2. AR In Medicine

5.4.3. AR In Entertainment

## **Chapter 6: ETHICS AND PROFESSIONALISM OF EMERGING TECHNOLOGIES**

6.1. Technology and ethics

6.2. New ethical questions

6.2.1. General ethical principles

6.2.2. Professional responsibilities.

6.2.3. Professional leadership principles

6.3. Digital privacy

6.3.1. Information Privacy

6.3.2. Communication Privacy

6.3.3. Individual Privacy

6.3.4. Some digital privacy principle

6.4. Accountability and trust



## 6.5. Treats and challenges

### 6.5.1. Ethical and regulatory challenges

### 6.5.2. Treats

## **Chapter 7: Other emerging technologies**

### 7.1. Nanotechnology

#### 7.1.1. How it started

#### 7.1.2. Fundamental concepts in nanoscience and nanotechnology

#### 7.1.3. Applications of nanotechnology

### 7.2. Biotechnology

#### 7.2.1. History

#### 7.2.2. Application of biotechnology

### 7.3. Blockchain technology

#### 7.3.1. History

#### 7.3.2. Blockchain Explained

#### 7.3.3. The Three Pillars of Blockchain Technology

#### 7.3.4. How Blockchain Works

#### 7.3.5. Why do people use the peer-to-peer network?

#### 7.3.6. Application of blockchain

##### 7.4. Cloud and quantum computing

###### 7.4.1. Cloud computing

###### 7.4.2. Advantages of cloud computing

###### 7.4.3. Quantum computing

###### 7.4.4. Advantages of quantum computing

##### 7.5. Autonomic computing (AC)

###### 7.5.1. Characteristics of Autonomic Systems

### 7.6. Computer vision

#### 7.6.1. History

#### 7.6.2. Definition

#### 7.6.3. How computer vision works

#### 7.6.4. Applications of computer vision

### 7.7. Embedded systems

7.7.1. Advantages and disadvantages of embedded system

7.7.2. Basic Structure of an Embedded System

7.8. Cybersecurity

7.8.1. Definition

7.8.2. Cybersecurity measures

7.8.3. Types of cybersecurity threats

7.8.4. Benefits of cybersecurity

7.8.5. Cybersecurity vendors

7.9. Additive manufacturing (3D Printing)

7.9.1. 3D Printing: It's All About the Printer

7.9.2. Additive Manufacturing: A Bytes-to-Parts Supply Chain

## **21.1. Moral and Civic Education**

**Program: BSc. In Medical Laboratory Sciences**

**Module name: civic education and inclusiveness**

**Year: I Semester II**

**Module category: General**

**Module code: Cvin-M1012**

**Weight: 4 ECTS**

**Course name: Moral and civic education**

**Chapter One: Understanding Civics and Ethics**

1.1. Chapter Introduction

1.2. Chapter Objectives

1.3. Defining Civics, Ethics, Morality

1.3.1. Civic Education

1.3.2. The Definition and Nature of Ethics and Morality

Dear Student, Don 't you agree with Socrates? What is your view?

1.4. Ethics and Law

1.5. The Importance/Goal of Moral and Civic Education

**Chapter Two: Approaches to Ethics**

2.1. Chapter Introduction

2.2. Chapter Objectives

## 2.3. Normative Ethics

### 2.3.1. Teleological Ethics (Consequentialist)

### 2.3.2. Egoism: Ethical and psychological Egoism

#### 2.3.2.1. Ethical Egoism

#### 2.3.2.2. Psychological Egoism

### 2.3.3. Utilitarianism: Producing the best consequences

#### 2.3.3.1. Classic Utilitarianism

#### 2.3.3.2. Jeremy Bentham: Quantity over Quality

#### 2.3.3.3. John Stuart Mill: Quality over Quantity

#### 2.3.3.4. Act- And Rule-Utilitarianism

#### 2.3.3.5. Altruism

### 2.3.4. Deontological Ethics (Non- Consequentialist)

#### 2.3.4.1. The Divine Command Theory

#### 2.3.4.2. Rights Theory

#### 2.3.4.3. Kant 's Categorical Imperative

#### 2.3.4.4. Ross 's Prima Facie Duties or Moral Guidelines

### 2.3.5. Virtue Ethics

#### 2.3.5.1. Aristotle 's Ethics

## 2.4. Non-Normative Ethics/Meta-ethics

### 2.4.1. What is Meta-ethics?

### 2.4.2. Cognitivism and Non-Cognitivism

#### 2.4.2.1. Strong Cognitivism: Naturalism

##### 2.4.2.1.1. Strong Cognitivism: Non-Naturalism

##### 2.4.2.1.2. Strong Cognitivism without Moral Realism: Mackie's 'Error-Theory'

##### 2.4.2.1.3. Weak Cognitivism about Morals without Moral Realism: 'Best Opinion' Theories

### 2.4.3. Non-Cognitivism

#### 2.4.3.1. Internalist and Externalism, Humeanism and Anti- Humeanism

## **Chapter Three: Ethical Decision Making and Moral Judgments**

### 3.1. Chapter Introduction

### 3.2. Chapter Objectives

### 3.3. How Can We Make Ethical Decisions and Actions?

- 3.3.1. Ethical Principles and Values of Moral Judgments
- 3.3.2. Moral intuitions and Critical Reasoning
  - 3.3.2.1. Rationalization
  - 3.3.2.2. Types of reasoning
  - 3.3.2.3. Ethics and Religious Faith
  - 3.3.2.4. Testing moral arguments
- 3.3.3. Thinking Ethically: A framework for Moral Decision Making
  - 3.3.3.1. Fairness and Justice Approach
  - 3.3.3.2. The Common Good Approach
  - 3.3.3.3. The Rights Approach:
- 3.4. To Whom or What Does Morality Apply?
  - 3.4.1. Religious Morality
  - 3.4.2. Morality and Nature
  - 3.4.3. Individual Morality
  - 3.4.4. Social Morality
- 3.5. Who is Morally/Ethically Responsible?
  - 3.5.1. Moral Judgments
  - 3.5.2. What Makes an Action Moral?
- 3.6. Why Should Human Beings Be Moral?
  - A. Argument from Enlightened Self-Interest
  - B. Argument from Tradition and Law
  - C. Common Human Needs

#### Chapter Four: State, Government and Citizenship

- 4.1. Chapter Introduction
- 4.2. Chapter Objectives
- 4.3. Understanding State
  - 4.3.1. Defining State 101
- 4.4. Rival Theories of State
  - 4.4.1. The Pluralist State
  - 4.4.2. The Capitalist State
  - 4.4.3. The Leviathan State

- 4.4.4. The Patriarchal State
- 4.5. The Role of the State
  - 4.5.1. Minimal States
  - 4.5.2. Developmental States
  - 4.5.3. Social Democratic (Welfare) States
  - 4.5.4. Collectivized States
  - 4.5.5. Totalitarian States
  - 4.5.6. Religious States
- 4.6. Understanding Government
  - 4.6.1. What is Government?
  - 4.6.2. Purposes and Functions of Government
- 4.7. Understanding Citizenship
  - 4.7.1. Defining Citizenship
  - 4.7.2. Theorizing Citizenship
    - 4.7.2.1. Citizenship in Liberal Thought
    - 4.7.2.2. Citizenship in Communitarian Thought
    - 4.7.2.3. Citizenship in Republican Thought
    - 4.7.2.4. Multicultural Citizenship
  - 4.7.3. Modes/Ways of Acquiring and Loosing Citizenship
    - 4.7.3.1. Ways of Acquiring Citizenship
    - 4.7.3.2. The Modes of Acquiring Ethiopian Citizenship
    - 4.7.3.3. Dual Citizenship
  - 4.7.4. Ways of Loosing Citizenship
    - 4.7.4.1. Statelessness

## Chapter Five: Constitution, Democracy and Human Rights

- 5.1. Chapter Introduction
- 5.2. Chapter Objectives
- 5.3. Constitution and Constitutionalism
  - 5.3.1. Conceptualizing Constitution
  - 5.3.2. Peculiar Features of Constitution
  - 5.3.3. Major Purposes and Functions of Constitution

#### 5.3.4. Classification of Constitutions

#### 5.4. Constitutionalism

#### 5.5. The Constitutional Experience of Ethiopia: Pre and Post 1931

##### 5.5.1. Traditional Constitution (Pre- 1931)

##### 5.5.2. The 1931 First Written Constitution

##### 5.5.3. The Revised Constitution of 195

##### 5.5.4. The 1987 Constitution of People 's Democratic Republic Ethiopia (PDRE)

##### 5.5.5. The 1995 (FDRE) Constitution

#### 5.6. Democracy and Democratization

##### 5.6.1. Defining Democracy

##### 5.6.2. Values and Principles of Democracy

##### 5.6.3. Democratization

##### 5.6.4. Actors of Democratization

###### 5.6.4.1. Political Parties

###### 5.6.4.2. Media

###### 5.6.4.3. Civic Societies

#### 5.7. Human Rights: Concepts and Theories

##### 5.7.1. What Are Human Rights?

##### 5.7.2. Human Rights and Responsibilities

##### 5.7.3. Landmarks in Development of Human Rights

##### 5.7.4. Rights Holders and Duty Bearers

##### 5.7.5. Categories of Human Rights

###### 5.7.5.1. Civil and Political Rights

###### 5.7.5.2. Social and Economic Rights

###### Peace, Development and Environmental Rights

##### 5.7.6. Derogations and Limitations on Human Rights

##### 5.7.7. Non-draggability of Human Rights

##### 5.7.8. Implementation and Enforcement of Human Rights

###### 5.7.8.1. International Mechanisms and the International Bill of Human Rights

###### 5.7.8.2. Regional Mechanisms

##### 5.7.9. The Ethiopian Human Rights System

## 21.2. General Chemistry

Course code: Chem-M1012

Cr. Hr (ECTS): 3 Cr Hr (5 ECTS)

### CHAPTER ONE

#### Essential Ideas in Chemistry

##### 1.1. Chemistry in Context

###### 1.1.1. Chemistry as the Central Science

###### 1.1.2. The Scientific Method

###### 1.1.3. The Domains of Chemistry

##### 1.2. State and Classification of Matter

###### 1.2.1. State of Matter

###### 1.2.2. Classification of Matter

##### 1.3. Physical and Chemical Properties

##### 1.4. Extensive and Intensive Property

##### 1.5. Measurements and Units

###### 1.5.1. SI Base Units

###### 1.5.2. Derived SI Units

##### 1.6. Measurement Uncertainty

###### 1.6.1. Significant Figures in Measurement

###### 1.6.2. Significant Figures in Calculations

###### 1.6.3. Accuracy and Precision

##### 1.7. Conversion Factors and Dimensional Analysis

### **CHAPTER TWO; Atoms, Molecules and Ions**

#### 2.1. Atomic structure and symbolism

##### 1.1. Chemical Symbols and Isotopes

##### 2.1.2. Atomic mass unit and average atomic mass.

#### 2.2. Chemical Formulas

#### 2.3. The Periodic Table

##### 2.3.1. Historical development of the periodic table

##### 2.3.2. Classification of elements in the periodic table

- 2.4. Ionic and Molecular Compounds
  - 2.4.1. Formation of Ionic Compounds
  - 2.4.2. Formation of Molecular Compounds
- 2.5. Chemical Nomenclature
  - 2.5.1. Ionic compounds
  - 2.5.2. Molecular Compounds

### **CHAPTER THREE**

- 3.1. Formula Mass and Mole Concept
  - 3.1.1. Formula Mass
- 3.2. Determining empirical and molecular formulas
  - 3.2.1. Percent Composition
  - 3.2.2. Determination of Empirical Formulas
  - 3.2.3. Determination of molecular formulas
- 3.3. Molarity and Other Concentration Units
  - 3.3.1. Molarity
  - 3.3.2. Dilution of Solutions
  - 3.3.3. Percentage (W/W, W/V and V/V)
  - 3.3.4. Parts per million (ppm) and Part per billion (ppb)

### **CHAPTER FOUR**

#### Stoichiometry of Chemical Reaction

- 4.1. Writing and Balancing Chemical
  - 4.1.1. Writing Chemical Equations
  - 4.1.2. Balancing Chemical Equations
  
  - 4.1.3. Equations for Ionic Reactions
- 4.2. Classification of chemical reactions
  - 4.2.1. Acid-base reactions
  - 4.2.2. Precipitation reactions and solubility rules
  - 4.2.3. Oxidation-Reduction Reactions
- 4.3. Reaction stoichiometry
- 4.4. Reaction Yield
  - 4.4.1. Limiting Reactant



4.4.2. Percent Yield

4.5. Quantitative Chemical Analysis

4.5.1. Acid-base Titration

4.5.2. Gravimetric Analysis

## CHAPTER FIVE

Electronic Structure and Periodic Properties of Elements

5.1. Electromagnetic energy

5.1.1. Characteristics of Light

5.1.2. Quantization and Photons

5.2. The Bohr Model

5.3. Development of Quantum Theory

5.3.1. The Quantum–Mechanical Model of an Atom

5.3.2. Quantum Theory of Electrons in Atoms

5.3.3. The Pauli Exclusion Principle

5.4. Electronic Structure of Atoms 194

5.4.1. Orbital Energies and Atomic Structure

5.4.2. The Aufbau Principle

5.4.3. Electron Configurations and the Periodic Table

5.4.4. Electron Configurations of Ions

5.5. Periodic Variation in Element Properties

5.5.1. Variation in Covalent Radius

5.5.2. Variation in Ionic Radii

5.5.3. Variation in Ionization Energies

5.5.4. Variation in Electron Affinities

## CHAPTER SIX

Chemical Bonding and Molecular Geometry

6.1. Ionic Bonding

6.1.1. The Formation of Ionic Compounds

6.1.2. Electronic Structures of Cations and Anions

6.2. Covalent Bonding

6.2.1. Formation of Covalent Bonds

- 6.2.2. Polarity of Covalent Bonds
- 6.3. Lewis structures
  - 6.3.1. Writing Lewis Structures with the Octet Rule
  - 6.3.2. Exceptions to the Octet Rule
- 6.4. Formal Charges and Resonances
  - 6.4.1. Calculating Formal Charge
  - 6.4.2. Predicting molecular structure using formal charge
  - 6.4.3. Resonance
- 6.5. Strengths of ionic and covalent bonds
  - 6.5.1. Ionic bond strength and lattice energy
  - 6.5.2. Bond strength of covalent bond
- 6.6. Molecular structure and polarity
  - 6.6.1. VSEPR Theory
  - 6.6.2. Molecular structure and dipole moment
- 7. Equilibrium Concepts and Acid-base Equilibrium
  - 7.1. Chemical Equilibrium
    - 7.1. Le Chatelet's principle
    - 7.2. Equilibrium calculation
  - 7.3. Concepts of acid-base
    - 7.3.1. Arrhenius concept
    - 7.3.2. Brønsted-Lowery concept
    - 7.3.3. Lewis's concept
  - 7.5. pH and pOH
  - 7.6. Relative Strength of Acids and Base
  - 7.7. Buffers Solution

## CHAPTER EIGHT.

### ORGANIC

- 8.1. Hydrocarbons
  - 8.1.1. Alkanes
  - 8.1.2. Alkenes

- 8.1.3. Alkynes
- 8.2. Aromatic Hydrocarbons
- 8.3. Alcohols and Ether
  - 8.3.1. Alcohols
  - 8.3.2. Ethers
- 8.4. Aldehydes, Ketones, Carboxylic acids and Esters
  - 8.4.1. Aldehydes and Ketones
  - 8.4.2. Carboxylic Acids and Esters
- 8.5. Amines and Amides
  - 8.5.1. Amines
  - 8.5.2. Amides

**21.2. Determinants of Health Module syllabus**  
**Module name: Determinants of Health (SPH I)**

**Module code: SPH-M2152**

**Module EtCTS: 3**

**Program: BSc Medical Laboratory Sciences**

**Delivery year: II**

**Module duration: 20weeks**

**Prerequisite: None**

**Module description:** This module is designed to equip medical laboratory Sciences professionals with the knowledge, attitude and skills needed to examine the human behavior, and concepts of sociology so as to enable them to develop positive attitudes towards self and human

relationships in the practice of laboratory profession. It also equips them with general concepts related to environmental control activities relevant to health promotion and disease prevention with focus on the control of water supply, waste management, control of insects and rodents, food hygiene & housing.

Weight of Each course:

- Environmental Health: 50%
- Sociology: 50%

**Module Objective:** At the end of this module, the Medical Laboratory Science students will be

able to acquire knowledge and skills needed to identify and intervene phyco-social, environmental and ecological factors to human health.

**Module competency:** After completion of this module, Medical Laboratory Sciences students will be competent utilize of the concepts of psychology, sociology and environmental in providing psycho-social care and apply principles of environmental control.

Learning Assessment methods (both formative and summative)

- Final Written Examination: 50% (The whole module)
- Test 1: 10 %
- Test 2: 15%
- Test 3: 15%
- Assignment, projects with presentations: 10%

#### Reference Books

1. Yemane Berhane, Damen Hailemariam and Helmu Kloos. Epidemiology and ecology of Health and Disease in Ethiopia.2006
2. EPHTI. Ecology. Lecture note series for health science students.2007
3. White, P. Biopsychosocial medicine: An integrated approach to understanding illness. 2005 Oxford University Press.
4. Frankel, R. M., Quill, T. E., & McDaniel, S. H. Biopsychosocial approach: Past, present, future. 2003. University of Rochester Press.
5. Singer, M. & Baer, H. A. Introducing medical anthropology: A discipline in action (2nd ed.) 2011. Rowman Littlefield
6. Bernice A. Pescosolido, Jack, Jack K. Martin, Jane D. McLeod, Anne Rogers (Editors). Handbook of the Sociology of Health, Illness, and Healing. A Blueprint for the 21st Century.2011
7. Bird, C. E., Conrad, P., Fremont, A. M., & Timmermans, S. Handbook of medical sociology (6th ed.) 2010. Vanderbilt University.
8. Sobo, E. J. & Loustaunau, M. Cultural context of health, illness, and medicine (2nd ed.) 2010.Greenwood
9. David French et al. Health psychology (2nd ed.) 2010. Blackwell Publishing
10. By Susan Ayers, Richard de Visser. Psychology of medicine.2011
11. WHO. Closing the gap in a generation: health equity through action on the social

determinants of health: final report of the commission on social determinants of health. 2008.

12. Robert H Friis. Essentials of environmental health (2nd edition). The essential public health series.2012.

13. Kathryn Hilgenkamp. Environmental Health: Ecological Perspectives.2006

14. Herman Koren and Michael Bisesi.Handbook of environmental health.2002.

### Module Schedule

Units	Contents	Methods	Hours allocated	Weeks
<b>Introduction to Human health, society and culture</b>	<b>Introduction to medical sociology and medical anthropology</b> <ul style="list-style-type: none"> <li>• Importance of studying sociology and role in medical laboratory sciences</li> <li>• Understanding health, illness and disease and healing: sociological and anthropological perspective</li> </ul>	Interactive Lecture	2 Hrs	<b>Week 1 (Sociology)</b>
<b>Introduction to environmental health</b>	<ul style="list-style-type: none"> <li>• Definitions of terms and scope of Environmental health</li> <li>• Global aspects, issues and history of environmental Health</li> </ul>	Interactive Lecture	2 Hrs	<b>Week 2 (Environmental Health)</b>
<b>Social and cultural aspects of human health</b>	<b>Socio-cultural factors affecting human health</b> {place of residence, urbanization, culture, religion, ethnicity, gender views and roles, status of women, educational status, demography, social structures (mobility and migration) and organizations (social cohesion, support and network), laws, human rights }	Interactive lecture	4 Hrs	<b>Week 3-4 (Sociology)</b>
<b>Introduction to safe water supply</b>	<ul style="list-style-type: none"> <li>• Definitions</li> <li>• Source of water</li> <li>• Importance</li> <li>• Water and water related diseases</li> <li>• Protection and treatment of water sources</li> <li>• Water pollution and its effects</li> </ul>	Interactive lecture	2 Hrs	<b>Week 5 (Environmental Health)</b>

<b>Social and cultural aspects of medicine</b>	<ul style="list-style-type: none"> <li>• Religion</li> <li>• Ethno medicine,</li> <li>• Alternative and complementary medicine</li> </ul>	Interactive lecture	2 Hrs	<b>Week 6 (Sociology)</b>
<b>Food Hygiene</b>	<ul style="list-style-type: none"> <li>• Definitions</li> <li>• Principles and methods of food processing and preservation</li> <li>• Food and Disease</li> <li>• Prevention of food borne diseases</li> <li>• Sanitation of Food and Beverages</li> <li>• Inspection of food and drink service establishment</li> </ul>	Interactive lecture	2 Hrs	<b>Week 7 ((Environmental Health)</b>
<b>Human health and socio-economic factors</b>	<b>Economic factors include</b> {Unemployment, poverty, income inequality, neighborhood deprivation, assets, economic growth, globalization, healthcare cost}	Interactive lecture	2 Hrs	<b>Week 8 (Sociology)</b>
<b>Health and human behavior</b>	<b>The role of behavior in health</b> <ul style="list-style-type: none"> <li>• Smoking</li> <li>• Physical activity</li> <li>• Eating behavior</li> <li>• Alcohol and drug use</li> <li>• Sexual health and behavior</li> <li>• Chronic illness, death and dying</li> </ul>	Interactive lecture	2 Hrs	<b>Week 9 (Sociology)</b>
<b>Waste management</b>	<b>Definitions</b> <ul style="list-style-type: none"> <li>• Classification and types of solid waste</li> <li>• Options of solid waste management</li> <li>• Effects of solid waste mismanagement</li> <li>• Managing excreta and sewage disposal</li> <li>• Methods of excreta and sewage disposal</li> <li>• Fecal borne diseases</li> <li>• Gaseous waste management</li> </ul>	Interactive lecture	2 Hrs	<b>Week10 (Environmental Health)</b>
<b>Culture</b>	<b>Nature of culture, man's cultural past, diversity and uniformity of culture</b> Social Organization Social groups -crowds and public groups -nations, race Social institutions: The family, marriage, education, religion, arts, economic organization, Cultural lag	Interactive lecture	2 Hrs	<b>Week 11 (Sociology)</b>

<b>Housing and institutional Health</b>	<b>Introduction to Housing and institutional health</b> <ul style="list-style-type: none"> <li>• Housing</li> <li>• Definition of terms</li> <li>• Basic housing principles</li> <li>• Public health importance</li> <li>• Criteria for an adequate village house</li> <li>• Certain basic elements of housing standards</li> <li>• Institutional health or sanitation</li> <li>• School health</li> <li>• Prison Health, Hospital, Health center, etc.</li> </ul>	Interactive lecture	2 Hrs	<b>Week 12</b> <b>(Environmental Health)</b>
<b>Social Problems</b>	<b>Introduction to Social Disorganization, control and Planning</b> <ul style="list-style-type: none"> <li>• Poverty, population, housing, illiteracy</li> <li>• Food supplies, growth of urbanization, prostitution</li> <li>• Minority groups, rights of women, and children delinquency and crime</li> </ul>	Interactive lecture	2 Hrs	<b>Week 13</b> <b>(Sociology)</b>
<b>Vector and rodent control</b>	<b>Vector control</b> <ul style="list-style-type: none"> <li>• Vectors of public health importance</li> <li>• vector borne diseases</li> <li>• Ways of transmission of vector borne diseases</li> <li>• Prevention and control of vectors</li> <li>• Rodent control</li> <li>• Identification</li> <li>• Investigation of rodent infestation</li> <li>• Diseases transmitted by rodents</li> <li>• Prevention and control of rodents</li> </ul>	Interactive lecture	2 Hrs	<b>Week 14</b> <b>(Environmental Health)</b>
<b>Process of social Interaction</b>	<ul style="list-style-type: none"> <li>• Competition</li> <li>• Conflict-war,</li> <li>• Co-operation</li> <li>• Accommodation and assimilation</li> </ul>	Interactive lecture	2 Hrs	<b>Week 15</b> <b>(Sociology)</b>
<b>Occupational Health and Safety</b>	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Definition of terms</li> <li>• The scope of occupational health, and safety</li> <li>• Elements of the work environment</li> <li>• Classification of occupational health hazards</li> </ul>	Interactive lecture	2 Hrs	<b>Week 16</b> <b>(Environmental Health)</b>

	<ul style="list-style-type: none"> <li>Occupational health hazard control</li> </ul>			
<b>Field observation</b>		Facility Visit	4 Hrs	<b>Week 17-18</b>
Exam week	Module Completion and Examination			<b>Week 19 - 20</b>
<b>Community practice along with Clinical practice Objective</b> <ul style="list-style-type: none"> <li>To analyze biological, psychological, behavioral and socio-economic determinants of health and disease at individual, family and community level</li> <li>Identify and interpret these determinants of health</li> <li>Design strategies to promote health and prevent disease</li> </ul>				
<b>Teaching methods</b> <ul style="list-style-type: none"> <li>Guided community practice</li> <li>Facilitated discussion after exposure of learning experience</li> <li>Small group work and Seminar</li> </ul>				

### 21.3. Chemistry Module Syllabus

**Module Name: Chemistry**

**Module Code: Chem-M2162**

**Module EtCTS:10**

**Program: Undergraduate BSc in Medical Laboratory Sciences**

**Year: II**

**Module duration: 20 weeks**

**Prerequisites: None**

**Module Description:** This module covers the basic and fundamental principles of organic and analytic chemistry, allowing the student to begin understanding the language of chemists. A broad overview of the properties and characteristics of organic molecules is provided, and several key reactions and reaction mechanisms are discussed. Functional groups in organic chemistry; stereochemistry; structural elucidation and molecular spectroscopy; classes of organic reactions; aromatic compounds; carbonyl compounds, and biological molecules. Technique in experimental organic chemistry: recrystallization, melting point determination, simple and



fractional distillation, stem distillation, functional group identification, organic compounds in three dimensions using models, preparation of aspirin, soap, esters, qualitative organic analysis and chromatography. Acids and bases and neutralization titration, complex ion formation and complex metric titration; redox equilibrium and redox titration; measurement of dissolved oxygen and chemical oxygen demand (COD); Gravimetric analysis; chromatographic techniques: paper, thin layer, gas chromatography and HPLC; spectrophotometry.

**Weight of Each course:**

- Analytical Chemistry: 50%
- Organic Chemistry: 50%

**Module Competencies**

- Identify the chemical characteristics of different chemical compounds and solutions
- Prepare stock and working laboratory solution of different concentrations

**Learning Outcomes:**

- Understand concepts of organic and analytical chemistry
- Classify organic compounds based on their characteristics
- Discuss the principles and types of chemical reactions and their applications
- Discuss the different isomers
- Understand the structure and characteristics of biological molecules
- Discuss the different steps, methods and techniques of chemical analysis
- Explain different ways of validating analytical methods
- Explain the types, safe use and storage of chemicals
- Measure the pH of a given solution
- Prepare solutions and reagents for chemical analysis
  
- Apply colorimetric and chromatographic methods to determine concentrations of compounds

**Teaching and learning methods**

- Interactive lecture & discussions
- Laboratory Demonstration
- Laboratory practice

**Teaching and learning materials**

- Learning guides and checklists,

- Textbooks
- Reference manual
- Writing board
- Posters/Pictures
- LCD Projector
- White board, marker
- Laptop

### **Learning Assessment methods (both formative and summative)**

- Written Examination
- Practical Examination
- Assignment, projects, Presentation
- Lab reports

### **Summative Assessment**

- Final Written Examination: 50% (The whole module)
- Test 1: 10 %
- Test 2: 15%
- Test 3: 10%
- Assignment, projects with presentations: 10%
- Lab reports: 5%

### **Reference Books**

1. Skoog, D.A.; West, D.M.; Holler, F.J. Fundamentals of Analytical Chemistry, 8th ed.; Saunders College Publishing, New York,2004.
2. Christian, G.D. Analytical Chemistry, 5th ed., John Willey and sons, Inc., New York,1994.
3. Harris, D.C. Quantitative Chemical Analysis, 4th ed., W.H. Freeman and company, New York, 1995.
4. Jeffery, G.H.; Bassett, J.; Mandham, J.; Denney, R.C. Vogel's Text Book of Quantitative Chemical Analysis, John Willey and sons, Inc., New York1991.
5. Fifield, F.W., Keale, D. Principles and practice of analytical chemistry, 3rded., Blakie academic and professional, Glasgow,1990.

6. Marmet, J.M.; Otto, M.; Widmer, H.M. (editors). Analytical chemistry, Willey-VCH, Weinheim, 1999.

### Module schedule

Week	Learning Activity	Hours
Week 1	<p><b>Interactive lecture on:</b></p> <ul style="list-style-type: none"> <li>▪ <b>Concepts of Organic chemistry (3 hrs)</b> <ul style="list-style-type: none"> <li>– Introduction</li> <li>– Atomic orbitals, Bonding</li> <li>– Hybridization</li> <li>– Induction, Resonance</li> <li>– Acidity and basicity</li> <li>– Reaction intermediates</li> </ul> </li> <li>▪ <b>Concepts of analytical chemistry (4hrs)</b> <ul style="list-style-type: none"> <li>– Scope of analytical chemistry</li> <li>– Methods of analysis in analytical chemistry</li> </ul> </li> <li>▪ <b>Classes of organic compounds (2 hrs)</b> <ul style="list-style-type: none"> <li>– Nomenclature (Alkane, Alkenes, Alkynes, aromatic and carbonyl compounds, alcohols, carboxylic acids, and its derivatives, Amines, Ethers)</li> </ul> </li> </ul>	9 hrs
Week 2	<p>Interactive lecture, discussion</p> <ul style="list-style-type: none"> <li>▪ Classes of organic compounds (1hr) <ul style="list-style-type: none"> <li>– Chemical and physical properties</li> <li>– Synthesis</li> </ul> </li> <li>▪ Reaction of Compounds (5hrs) <ul style="list-style-type: none"> <li>– Principles and applications of chemical reactions <ul style="list-style-type: none"> <li>▪ Substitution reaction</li> </ul> </li> </ul> </li> </ul>	9hrs

	<ul style="list-style-type: none"> <li>▪ Elimination reaction</li> <li>▪ Addition reaction</li> <li>▪ Rearrangement reaction</li> </ul> <ul style="list-style-type: none"> <li>– Stereochemistry (2hrs) <ul style="list-style-type: none"> <li>– Introduction to isomers <ul style="list-style-type: none"> <li>• Conformational isomers</li> </ul> </li> </ul> </li> </ul>	
Week 3	<p>Interactive lecture, discussion</p> <ul style="list-style-type: none"> <li>– Stereochemistry (3hrs) <ul style="list-style-type: none"> <li>– Conformational analysis</li> <li>– Geometric isomers</li> <li>– Optical isomers</li> <li>– Optical activity</li> </ul> </li> <li>– Fisher projection biological molecules (1hr)</li> <li>– Carbohydrates (1hr)</li> </ul>	4hrs
	Laboratory practice	6hrs
Week 4	<p>Interactive lecture, discussion</p> <ul style="list-style-type: none"> <li>– Biological molecules (3hrs)</li> <li>– Amino acids, peptides and proteins (1hr)</li> <li>– Lipids (1hr)</li> <li>– Nucleic acids (1hr)</li> <li>– Chemical Analysis (1hr)</li> <li>– Qualitative methods of Chemical analysis (1hr)</li> </ul>	4 hrs
	Laboratory practice	6hrs
Week 5	<p>Interactive lecture, discussion</p> <ul style="list-style-type: none"> <li>– Chemical Analysis (2hr) <ul style="list-style-type: none"> <li>○ Quantitative methods of Chemical analysis</li> </ul> </li> <li>– Analytical method validation (1hr)</li> <li>– Types, safe use and storage of chemicals (1hr)</li> </ul>	4 hrs
	Laboratory practice	6hrs

Week 6	Interactive lecture, discussion <ul style="list-style-type: none"> <li>– Titration (4hrs) <ul style="list-style-type: none"> <li>○ Acid base titration</li> <li>○ Complexometric titration</li> </ul> </li> </ul>	4 hrs
	Laboratory practice	6hrs
Week 7	Interactive lecture, discussion Titration <ul style="list-style-type: none"> <li>– Redox titration</li> <li>– Precipitation titration</li> </ul>	4 hrs
	Laboratory practice on titration	6hrs
Week 8	Titration continued (4hrs)	4hrs
	Laboratory practice on titration	6hrs
Week 9	Interactive lecture, discussion <ul style="list-style-type: none"> <li>– pH of solutions and its measurement (4hrs)</li> </ul>	4hrs
	laboratory practice	6hrs
Week 10	Interactive lecture, discussion <ul style="list-style-type: none"> <li>– Types and preparation of solutions (4hrs)</li> </ul>	4 hrs
	Laboratory practice on PH measurement	6hrs
Week 11	Interactive lecture, discussion <ul style="list-style-type: none"> <li>– Determination of concentrations of solutions (4hrs)</li> </ul>	4 hrs
	Laboratory practice	6hrs
Week 12	Interactive lecture, discussion <ul style="list-style-type: none"> <li>– Principle and types of gravimetric assay (4hrs)</li> </ul>	4 hrs
	Laboratory practice	6hrs
Week 13	Interactive lecture, discussion <ul style="list-style-type: none"> <li>– Principle and types of colorimetric assay (4hrs)</li> </ul>	4hrs
	Laboratory practice on colorimetric assay	6hrs
Week 14	Interactive lecture, discussion <ul style="list-style-type: none"> <li>– Principle and types of chromatographic techniques (4hrs)</li> </ul>	4 hrs
	Laboratory practice on chromatography	6hrs

Week 15	Interactive Lecture on – Laboratory demonstration and practice on solution preparation (4hrs)	4 hrs
	Laboratory practice	6hrs
Week 16	– Laboratory practice on colorimetric and chromatographic techniques	9 hrs
Week 17-18	– Laboratory practice in analytical and organic chemistry laboratories	40
	– Laboratory practice in analytical and organic chemistry laboratories	40
Week 19 – 20	– Examination week	

## **21.4. Biomedical science Module Syllabus**

**Module Name: Biomedical Sciences**

**Module code: Biom-M2172**

**Module EtCTS: 15**

**Program: Undergraduate BSc in Medical Laboratory Sciences**

**Year: II**

**Module duration: 20 Weeks**

**Pre-requisite: None**

### **Module Description:**

The module is intended to equip students with the basic knowledge of biomedical sciences of anatomy, physiology, biochemistry

### **Module Competency**

- Identify appropriate anatomic sites for biological sample collection
- Identify structure, functions and biochemical contents of cells and organs

Learning outcome

- ✓ Describe concepts, terminologies and principles of human anatomy
- ✓ Identify the normal structure of the human body
- ✓ Describe concepts, terminologies and principles of human physiology
- ✓ Identify the normal function of the human body
- ✓ Practice the normal physiological value to different diagnostic tests
  
- ✓ Describe concepts, terminologies and principles of biochemistry
- ✓ Discuss function, metabolism, classification and clinical significance of bio-molecules
- ✓ Apply the basic concepts of biochemistry to medical laboratory practice

Teaching-Learning Methods and activities

- Interactive lecture and discussion
- Facilitated discussion
- Role play

- Case study
- Video show
- Demonstration (at skills lab)
- Guided clinical practice
- Peer professional guidance (senior students to assist their more junior peers by passing on important and useful information)

Teaching-Learning Materials and resources

Reference Books and Resources

References

1. Gray's anatomy for students. 2007
2. Lumley, J.S.P, Essential, Anatomy & some clinical Applications, 1995
3. Beck Ernest W. Mosby's Atlas of Functional Human Anatomy, 1982
4. Ross, Janet S. Ross & Wilson anatomy & Physiology, 1990
5. Solomon, Eldra K Pearl, Understanding Human Anatomy & physiology 1987
6. Yekoye Abebe, Bhardwaj, G.P., and Habtamu Mekonnen: physiology lecture notes for health science students. University of Gondar and Jimma University in collaboration with EPHTI,
7. Guyton and Hall. Textbook of medical physiology. 11th edition. 2006.
8. Ashis Banerjee. Clinical physiology. An examination primer. 2005.
9. John Baynes and Marek Dominiczak. Medical biochemistry. 4th edition. 2014
10. Alan Gaw. Clinical biochemistry 5th edition. 2013
11. Eric Arthur Newsholme and Tony R. Leech. Functional biochemistry in health and disease. 2010.

**Learning Assessment methods (both formative and summative)**

- o Written cognitive knowledge test (MCQ/essay)
- o Performance assessment in Simulated environment using OSPE
- o Performance assessment in real work setting using
  - Direct observation of practice (DOP)
  - Review of reflective portfolio
  - Review of works (assignments, projects, ....) completed by students
- o Case study
- o Peer assessment of professional behaviors
- o Structured Oral Examination



### Summative assessment

- OSPE. =30%
- Written cognitive knowledge test using MCQ/essay/case study = 50%
- Review of students' reflective portfolio = 20%

### Module schedule

Week	Learning Activity	Hours
Week 1	<b>Introduction to Human anatomy (3hrs)</b> <ul style="list-style-type: none"><li>• What is anatomy (gross, microscopic, embryology)</li><li>• Approaches to study anatomy</li><li>• Important anatomical terms</li></ul> <b>Introduction to human physiology (3hrs)</b> <ul style="list-style-type: none"><li>• What is physiology</li></ul> <b>Introduction to Biochemistry (3 hours)</b> <ul style="list-style-type: none"><li>• Introduction to biochemistry &amp; its relevance to Medical laboratory professionals</li></ul>	9hrs
Week 2	<b>Introduction to Human anatomy (3hrs)</b> <ul style="list-style-type: none"><li>• Anatomy of cell &amp; tissue</li></ul> <b>Introduction to human physiology (3hrs)</b> <ul style="list-style-type: none"><li>• Functional organization of the human body and control of the internal environment</li></ul> <b>Introduction to Biochemistry (3hours)</b>	9hrs
Week 3	<ul style="list-style-type: none"><li>• Microscopic &amp; macroscopic anatomy of the musculoskeletal system (3hrs)</li><li>• Physiology of integumentary system (3 hrs)</li><li>• Acid, base and buffer system (3hrs)</li></ul>	9hrs

<b>Week 4</b>	<ul style="list-style-type: none"> <li>• Microscopic &amp; macroscopic anatomy of the musculoskeletal system (3hrs)</li> <li>• Physiology of integumentary system continued (3hrs)</li> <li>• Genetic control of protein synthesis, cell function and cell reproduction (3hrs)</li> </ul>	<b>9hrs</b>
<b>Week 5</b>	<ul style="list-style-type: none"> <li>• Microscopic &amp; macroscopic anatomy of gastro-intestinal system &amp; intra-abdominal organ system (3hrs)</li> <li>• Physiology of musculoskeletal system (3 hrs)</li> <li>• Amino acids (3hrs)</li> </ul>	<b>9hrs</b>
<b>Week 6</b>	<ul style="list-style-type: none"> <li>• Anatomy of respiratory system (3hrs)</li> <li>• Physiology of musculoskeletal system continued (3hrs)</li> <li>• Enzymes (3hrs)</li> </ul>	<b>9hrs</b>
<b>Week 7</b>	<ul style="list-style-type: none"> <li>• Anatomy of respiratory system (3 hrs)</li> <li>• Physiology of gastro-intestinal system &amp; intra-abdominal organ system (3hrs)</li> <li>• Carbohydrate metabolism (3hrs)</li> </ul>	<b>9hrs</b>
<b>Week 8</b>	<ul style="list-style-type: none"> <li>• Macroscopic&amp; microscopic anatomy of circulatory system (3hrs)</li> <li>• Physiology of gastro-intestinal system &amp;intra- abdominal organ system (continued) (3hrs)</li> <li>• Carbohydrate metabolism (3hrs)</li> </ul>	<b>9hrs</b>
<b>Week 9</b>	<ul style="list-style-type: none"> <li>• Macroscopic&amp; microscopic anatomy of circulatory system <ul style="list-style-type: none"> <li>○ The cardiovascular system (3hrs)</li> </ul> </li> <li>• Physiology of respiratory system (3hrs)</li> <li>• Lipid metabolism (3 hrs)</li> </ul>	<b>9hrs</b>
<b>Week 10</b>	<ul style="list-style-type: none"> <li>• Macroscopic&amp; microscopic anatomy of circulatory system <ul style="list-style-type: none"> <li>○ Lymphatic system (3hrs)</li> </ul> </li> <li>• Physiology of respiratory system (3hrs)</li> <li>• Lipid metabolism (3 hrs)</li> </ul>	<b>9hrs</b>
<b>Week 11</b>	<ul style="list-style-type: none"> <li>• Macroscopic&amp; microscopic anatomy of genitourinary system</li> </ul>	<b>9hrs</b>

	<p><b>(3hrs)</b></p> <ul style="list-style-type: none"> <li>• Physiology of the cardiovascular system <b>(3hrs)</b></li> <li>• Amino acid and protein metabolism <b>(3hrs)</b></li> </ul>	
<b>Week 12</b>	<ul style="list-style-type: none"> <li>• Macroscopic &amp; microscopic anatomy of genitourinary system <b>(3hrs)</b></li> <li>• Physiology of the cardiovascular system <b>(3hrs)</b></li> <li>• Amino acid and protein metabolism <b>(3hrs)</b></li> </ul>	<b>9hrs</b>
<b>Week 13</b>	<ul style="list-style-type: none"> <li>• Macroscopic &amp; microscopic anatomy of genitourinary system <b>(3hrs)</b></li> <li>• Physiology of genitourinary system <b>(3hrs)</b></li> <li>• Amino acid and protein metabolism <b>(3hrs)</b></li> </ul>	<b>9hrs</b>
<b>Week 14</b>	<ul style="list-style-type: none"> <li>• Macroscopic &amp; microscopic anatomy of the endocrine system <b>(3hrs)</b></li> <li>• Physiology of genitourinary system <b>(3hrs)</b></li> <li>• Protein metabolism <b>(3hr)</b></li> </ul>	<b>9hrs</b>
<b>Week 15</b>	<ul style="list-style-type: none"> <li>• Macroscopic &amp; microscopic anatomy of the endocrine system <b>(3hrs)</b></li> <li>• Physiology of the endocrine system <b>(3hrs)</b></li> <li>• Protein metabolism <b>(3hr)</b></li> </ul>	<b>9hrs</b>
<b>Week 16</b>	<ul style="list-style-type: none"> <li>• Macroscopic &amp; microscopic anatomy of the nervous system <b>(3hrs)</b></li> <li>• Physiology of the endocrine system <b>(3hrs)</b></li> </ul>	<b>9hrs</b>
<b>Week 17</b>	<ul style="list-style-type: none"> <li>• Macroscopic &amp; microscopic anatomy of the nervous system <b>(3hrs)</b></li> <li>• Physiology of the nervous system <b>(3hrs)</b></li> </ul>	<b>9hrs</b>
<b>Week 18</b>	<ul style="list-style-type: none"> <li>• Macroscopic &amp; microscopic anatomy of the nervous system <b>(3hrs)</b></li> <li>• Physiology of the nervous system <b>(3hrs)</b></li> <li>• Hemoglobin metabolism <b>(3hrs)</b></li> </ul>	<b>9hrs</b>
<b>Week 19 - 20</b>	<b>Final exam</b>	

## **21.5. Molecular Biology and Applied Genetics Module syllabus**

**Module Name: Molecular Biology and Applied Genetics**

**Module code: MeLS-M2183**

**Module EtCTS: 8**

**Program: BSc Medical Laboratory Sciences**

**Year: II**

**Module Duration: 20 Weeks**

**Pre-requisite: None**

### **Module Description:**

This module deals with basic principle of genetics; gene expression transmission genetics, chromosome and hereditary, fundamental of Mendelian genetics, cell cycle and microbial genetics and how to perform molecular techniques in the diagnosis of microbial and genetic disease. This module is designed to enable BSc. Medical Laboratory Science students to apply the principles of genetic and molecular biology techniques to produce accurate results in the diagnosis and treatment of disease.

### **Module Competency:**

- Perform molecular tests on clinical specimens as per standard operating procedure.
- Interpret report and document laboratory test results correctly.

### **Learning Outcome:**

After completion of this module, the student is expected to:

- Discuss the principles of genetics and genomic concepts
- Explain structure of nucleic acids and their characteristics
- Discuss the basics of DNA replication, gene expression and its control in prokaryotes and eukaryotes
- Explain the cell cycle and its control
- Explain the applications of Mendelian genetics and non-Mendelian inheritance
- Explain Chromosomal morphology and gene mapping
- Discuss gene mutation, its causes and mechanism of repair
- Discuss central dogma of Molecular biology

- Discuss methods of gene transfer and the importance of vectors
- Perform basic molecular tests/techniques
- Properly interpret, report and document molecular test results

Teaching and learning methods and activities

- Interactive lecture
- Video show
- Laboratory Demonstration

Teaching and learning materials and resources

- Learning guides and checklists
- Text books
- Reference manual
- Writing board
- Posters/Pictures
- Guided clinical practice
- Laboratory practice
- Clinical attachment
- LCD Projector
- White board, marker
- Speakers
- Laptop

Learning Assessment methods (both formative and summative)

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Test 3: 5-10%
- Practical Examination: 5-10%
- Assignment, projects, field reports with presentations: 5-10%
- Lab reports: 5%
- Oral examination: 5%

### **Reference Books**

1. Robert F. weaver, Philip W. Hedrick. Genetics.

2. Benjamin Lewin: Genes VI and above
3. P.K. Gupta: Cell and Molecular Biology
4. Alberts Molecular Biology of the cell.
5. Darnel, Lodish, Baltimore. Molecular Cell biology
6. ABC of Clinical Genetics, 3rd ed. (Helen M,2002)
7. An introduction to molecular genetics: Jack J. Pasternak, 2005, 2ed.
8. James D. Watson: Recombinant DNA
9. Richard J. Epstein: Human Molecular Biology
10. Molecular genetics of bacteria 4th ed. (Jeremy W. Dale Simon F park, university of surrey, UK2004)
11. Darnel, Lodish, Baltimore. Molecular Cell Biology
12. Robert F. Weaver. Molecular biology

### Module Schedule

Week	Essential contents and Learning methods and Activities	Hours
Week 1	<p><b>1. Introduction to genetics</b></p> <p>1.1. Historical overview of genetics</p> <p>1.2. Nucleic acids overview</p> <p><b>Gene expression</b></p> <p>1.3. Gene expression in prokaryotes</p> <p>1.4. Gene expression in eukaryotes Control of gene expression</p> <p>1.5. Gene expression of Extra chromosomal DNA</p>	9 Hrs
Week 2	<p><b>2. Transmission genetics</b></p> <p>2.1. Mendel's laws of inheritance</p> <p>2.2. The chromosome theory of inheritance</p> <p><b>3. Chromosomes and heredity</b></p> <p>3.1. Sexual reproduction</p> <p>3.2. Mitosis</p> <p>3.3. Meiosis</p>	9hrs

<b>Week 3</b>	<b>4. Fundamentals of Mendelian genetics</b> 4.1.Principles of segregation, independent assortment, and probability 4.2.Mendelian inheritance in humans and sex linked	<b>8 Hrs</b>
<b>Week 4</b>	4.3.Recessive and dominant traits inheritance 4.4.Mendelian inheritance in humans: 4.5.Autosomal recessive and dominant traits inheritance	<b>9hrs</b>
<b>Week 5</b>	<b>5. Extension and application of Mendelian genetics</b> 5.1.Domeinance; Complete dominance, Incomplete dominance, Co-dominance, Lethals, Penetrance and expressivity, Multiple alleles, Genetic counseling and Paternity exclusion 5.2.Penetrance and expressivity, Multiple alleles, Genetic counseling and Paternity exclusion 5.3. <b>Non-Mendelian inheritance</b> <ul style="list-style-type: none"> <li>• <b>Mitochondrial DNA linked single gene disorders</b></li> </ul>	<b>9 Hrs</b>
<b>Week 6</b>	<b>6. The cell cycle and genetics of cancer</b> 6.1.Basic principles of Cell cycle 6.2.Stages of Cell cycle and chromosome segregation 6.3.Control mechanism of cell cycle 6.4. Genetics of cancer development 6.5.Abnormal cell cycle development	9hrs
<b>Week 7</b>	<b>7. Chromosome morphology</b> 7.1.Chromosomal changes (Cytogenecis) 7.2.Karyotyping 7.3.Changes in chromosomal structure 7.4.Sex determination 7.5.genetic linkage Changes in chromosomal number	<b>3 Hrs</b>
	<b>Laboratory</b>	<b>6 hrs</b>
<b>Week 8</b>	<b>8. Gene mapping</b> 8.1. <b>Gene mutation and extrachromosomal elements</b> 8.2.Types of mutations 8.3.Plasmids	<b>6 Hrs</b>

	8.4. Phages 8.5. Transposons <b>9. Microbial genetics</b>	
	<b>Laboratory</b>	<b>3hrs</b>
<b>Week 9</b>	<b>10. Introduction to molecular biology</b> 10.1. Define terms in molecular biology 10.2. Historical overview of molecular biology 10.3. Overview of cellular structure and function, Biologically important molecule 10.4. Cellular genetic components 10.5. The central dogma of molecular biology	<b>9 Hrs</b>
<b>Week 10</b>	<b>11. DNA as Primary Genetic Material</b> 11.1. Experimental basis of DNA 11.2. DNA structure and function 11.3. DNA Replication and enzymes involved 11.4. DNA Damage and Repair	<b>6 Hrs</b>
	<b>Laboratory</b>	<b>3hrs</b>
	<b>Mid exam</b>	
<b>Week 11</b>	<b>12. RNA and primary Gene Expression</b> 12.1. Types of RNA molecules & synthesis (Initiation, Elongation & Termination mechanism) 12.2. Prokaryotic transcription 12.3. Eukaryotic transcription and transcription factors 12.4. Chromatin structure and eukaryotic transcription 12.5. Post-transcriptional events; RNA splicing; capping; & polyadenylation	<b>6 hrs</b>
	<b>Laboratory</b>	<b>3hrs</b>
<b>Week 12</b>	<b>13. Genetic code and its translation</b> 13.1. Translation: Prokaryotic Vs Eukaryotic 13.2. Genetic code 13.3. Protein Structure related to function	<b>9Hrs</b>



	13.4. Post-translation Modification	
<b>Week 13</b>	<b>14. Regulation of gene expression</b> 14.1. Regulation of Translation 14.2. Strategies for controlling gene expression 14.3. Regulation of gene expression in Prokaryotes 14.4. Regulation of gene expression in eukaryotes	<b>9hrs</b>
<b>Week 14</b>	<b>15. Mutation</b> 15.1. Types of mutation 15.2. Mutagenic agents 15.3. How mutation affects the genetic code? 15.4. Repair of Mutation 15.5. Mutant isolation and detection  <b>16. Gene Transfer and Transposable Genetic Elements</b> 16.1. Extra chromosomal elements: plasmid, transposons 16.2. Method of study Gene Transfer: conjugation, transformation, transduction	<b>6 hrs</b>
	<b>Laboratory visit of Laboratory equipment</b>	<b>3 hrs</b>
<b>Week 15</b>	<b>17. Molecular Techniques</b> 17.1. Recombinant DNA technology/genetic engineering 17.2. Cloning and Cloning vectors 17.3. Steps in cloning 17.4. Gene cloning tools (Plasmids, restriction enzymes, etc ) 17.5. Gene Libraries	<b>6Hrs</b>
	<b>Laboratory</b>	<b>3hrs</b>
<b>Week 16</b>	<b>Laboratory practice on Molecular Techniques</b>	<b>9 Hrs</b>
<b>Week 17</b>	<b>Interactive Lecture on Molecular Techniques Cont...:</b> 17.6. Extraction of DNA, RNA from cells, 17.7. Gel electrophoresis 17.8. Southern, Northern, Western Blot 17.9. In Situ Hybridization 17.10. PCR	<b>6 Hrs</b>

	<b>Laboratory practice on Molecular Techniques</b>	<b>3 Hrs</b>
<b>Week 18</b>	<b>Interactive Lecture on Molecular Techniques Cont.:</b> 17.11.DNA Hybridization 17.12.Sequencing 17.13.RFLP and SNP 17.14.Molecular markers	<b>3 Hrs</b>
	Laboratory practice on Molecular Techniques	<b>6 Hrs</b>
<b>Week 19</b>	<b>Laboratory practice on Molecular Techniques</b>	<b>9hrs</b>
<b>Week 20</b>	<b>Final Witten and Practical Examination</b>	

## **21.7. Basic to Medical Laboratory Science module syllabus**

**Module name: Basics to Medical Laboratory Sciences**

**Module Code: MeLS-M2193**

**Module EtCTS: 12**

**Program: BSc Medical Laboratory Sciences**

**Year: II**

**Module Duration: 20 Weeks**

**Pre-requisite: None**

**Module Description:** This module is intended to equip BSc Medical Laboratory Science Students with the fundamentals of medical laboratory practice including principles of specimen collection, transportation and storage; ethical and legal principles of medical laboratory science profession; Medical Laboratory Organization; basic principles of instruments and automation in medical laboratory practice; quality control, safety issues and accident control measures in medical laboratory practice.

### **Module Competency:**

- Apply medical laboratory ethical code of conduct and contribute to stewardship profession
- Perform sample collection, processing and storage
- Implement laboratory standard operating procedures while performing tests
- Use automated equipment and instruments capable of performing a number of tests simultaneously and another sophisticated laboratory equipment
- Value compassionate, respectful, and caring behavior at individual and family level

### **Learning outcomes:**

After completion of this module, students are expected to:

- Apply the codes of ethics for medical laboratory professionals within the law in relation to practice, legal process, principles and penalties
- Describe the organization and role of the laboratory
- Establish and maintain positive, respectful collaborative working relationship with clients and families
- Explain the collection, handling, shipment and safe disposal of laboratory specimens

- Apply the basic principles of specimen collection for laboratory practice
- Explain the scope and function of laboratory instruments
- Identify, use, care and clean different laboratory equipment and wares
- Apply the principles of sterilization and disinfection for laboratory works
- Apply the working principles of spectrophotometers, cell counting, automations, electrophoresis, electrochemical techniques, and chromatographs radioactive detection.
- Inspect the functionality of commonly used laboratory equipment and wares
- Explain the possible factors contributing to laboratory accidents and carry out safety and first aid procedures for laboratory accidents
- Practice safety precautions and safe disposal of wastes in the laboratory
- Prevent accidental injuries and apply the knowledge of first Aid for the injured or suddenly ill to take life saving measures
- Discuss safety precautions and safe disposal of wastes in the laboratory

#### **Teaching-Learning Methods and activities**

- Interactive lecture and discussion
- Facilitated discussion
- Case study
- Video show
- Demonstration (at skills lab)
- Guided clinical practice

#### **Teaching-Learning Materials and resources**

- Learning guides and checklists
- Text books
- Reference manual
- Posters/Pictures
- LCD Projector
- White board marker
- Laptop

#### **Reference Books**

1. Linne Jean Jergenson, Basic techniques of medical laboratory 4th ed.2000

2. WHO, Manual of basic techniques for a health laboratory 2000
3. Cheesbrough M. District Laboratory manual for tropical countries, 2000 (VolII).
4. Cheesbrough M. District Laboratory manual for tropical countries, 2000 (VolIII)
5. Seyoum B. Introduction to medical laboratory technology students, lecture noteseries 2002.
6. Burtis CA, A.E., Tietz fundamental of clinical chemistry. 7 ed. 2007, USA:W.B. sounders
7. Lecture note series on Laboratory Instrumentation, Carter center,2008.
8. Ethiopian Medical Laboratory Association (EMLA): Code of Ethics for Medical Laboratory Technologists Practicing in Ethiopia,2008
9. Medical Ethics Manual, world medical association,2005
10. International Federation of Biomedical Laboratory Science (IFBLS) code ofethics IFBLS general assembly of delegates,1992

• **Learning Assessment methods (both formative and summative)**

- o Written Examination (Final, continues. )
- o Practical Examination
- o Assignment, projects, field reports, Presentation
- o Oral examination
- o Lab reports
- Summative assessment
- o Final Written Examination: 50% (The whole module)
- o Test 1: 10 %
- o Test 2: 15%
  
- o Practical Examination: 10%
- o Assignment, projects with presentations: 10%
- o Lab reports: 5%

**Module Schedule**

<b>Week</b>	<b>Essential contents and learning methods and Activities</b>	<b>Hours</b>
<b>Week 1</b>	<p><b>1. Introduction to Immunology</b></p> <p>1.1.History of immunology</p> <p>1.2.The immune system</p> <p>1.3.Natural immune system</p> <p>1.4.Adaptive immune system</p> <p><b>2. Cells and organs of the immune system</b></p> <p>2.1.Organs of the Immune system (Primary and secondary)</p> <p>2.2.Cells of the immune system</p> <p>2.3.Types and development of immune cells</p> <p>2.4.Function of immune cells</p>	10hrs
<b>Week 2</b>	<p><b>3. Innate Immune System</b></p> <p>3.1.Anatomical and Physiologic barrier</p> <p>3.2.Innate Immune cell recognition mechanism of pathogen</p> <p>3.3.Inflammation</p> <p>3.4.Phagocytosis</p> <p>3.5.Complement system</p>	10hrs
<b>Week 3</b>	<p><b>4. Major Histocompatibility complex (MHC) and antigen presentation</b></p> <p>4.1.Professional antigen presentation cells</p> <p>4.2.Types of MHC molecule</p> <p>4.3.Types of Antigen</p> <p>4.4.Antigen presentation</p>	10hrs
<b>Week 4</b>	<p><b>5. Adaptive cell mediated immune system</b></p> <p>5.1.T-cell maturation and regulation</p> <p>5.2.T-cell activation and differentiation</p> <p>5.3.Effector mechanism of cell mediated immune cells</p>	10hrs
<b>Week 5</b>	<p><b>6. Adaptive humeral immune system</b></p> <p>6.1.B-cell maturation and Regulation</p> <p>6.2.B-cell Activation and differentiation</p> <p>6.3.Immunoglobulin (structure, class and isotype)</p> <p>6.4.Effector mechanism of humeral immune response</p>	10hrs

<b>Week 6</b>	<b>7. Immune response to infectious disease</b> 7.1.Immune response to parasite infection 7.2.Immune response to viral infection 7.3.Immune response to bacterial infection  <b>8. Tolerance and Autoimmunity</b> 8.1.The development of central and peripheral tolerance 8.2.Development of autoimmunity 8.3.Types of auto immunity	10hrs
<b>Week 7</b>	<b>9. Hypersensitivity reactions (Types I, II, III, IV).</b> 9.1. Type one hypersensitivity 9.2. Type two hypersensitivity 9.3. Type three hypersensitivity 9.4. Type four hypersensitivity  <b>10. Immune deficiencies</b> 10.1. Primary immune deficiencies 10.2. Secondary immune deficiencies	10hrs
<b>Week 8</b>	<b>11. Tumor Immunology</b> <b>12. Assessment of immune component function (T-cell, B- cell, phagocytic cells)</b>	10hrs
<b>Week 9</b>	<b>13. Theory of Vaccinology</b> 13.1. History of vaccinology 13.2. Method of vaccine development 13.3. Types of Immunization 13.4. WHO immunization schedule	10hrs
<b>Week 10</b>	<b>14. Immunological and serological techniques</b> 14.1. Overview of immunological and serological techniques 14.2. Laboratory materials & equipment for immunologic and serologic tests 14.3. Laboratory animal handling and management  <b>15. Antigen-antibody reaction</b> 15.1. <b>Overview of antibody reaction</b>	7hrs
	<b>Laboratory visit on Instrument in Serology laboratory</b>	3hrs
<b>Week</b>	15.2. Primary binding test	6hrs

<b>11</b>	15.3. Immunofluorescence, ELISA, Radioimmunoassay	
	<b>Midterm exam</b>	
<b>Week 12</b>	15.4. Secondary binding tests 15.5. Precipitation Reactions, Agglutination, Complement fixation tests 15.6. Tertiary binding tests	3hrs
	<b>Laboratory visit on Instrument in Serology laboratory</b>	6hrs
<b>Week 13</b>	15.7. Flow Cytometer 15.8. ELISA 15.9. Methods of Monoclonal Antibody Production	3hrs
	Laboratory Visit and demonstration on Immunology Laboratory equipment (ELISA, flowcytometry)	6hrs
<b>Week 14</b>	<b>16. Specimen collection and preparation for serological tests</b> 16.1. <b>Safety, specimen collection, preparation, preservation and Shipment of serological specimens.</b> 16.2. <b>Dilution (Serial dilutions and Determination of end point and titer) and Complement inactivation</b>	7hrs
	<b>Laboratory practice on Serum preparation, Serum dilution and pipetting</b>	3hr
<b>Week 15</b>	<b>17. Common Serologic Tests for Bacterial and Parasitic disease</b> 17.1. Serological diagnosis for syphilis 17.1.1. Syphilis (Characteristics of the Organism, Mode of Transmission, Stages of the Disease, Congenital Syphilis, Nature of the Immune Response) 17.1.2. Serological diagnosis of syphilis	4hrs
	<b>Laboratory practice on Serum preparation, Serum dilution and pipetting</b>	6hrs
<b>Week 16</b>	17.2. Agglutination test for febrile diseases 17.2.1. Serological test for Salmonella infection 17.2.2. Serological test for Rickettsial infections 17.2.3. Serology of Streptolysin O (SLO) and Anti- streptolysin O (ASO)	4hrs
	Laboratory demonstration and practice on ASO, RPR and VDRL test for syphilis qualitative and quantitative methods	6hrs
<b>Week</b>	17.3. Serological tests for Helicobacter pylori	5hrs



<b>17</b>	17.4. Serology test for Malaria 17.5. Serological tests for Leishmaniasis 17.6. Serological tests Toxoplasmosis	
	<b>Laboratory practice on selected bacterial and parasitic diseases</b> <b>Demonstration on ELISA</b>	6hrs
<b>Week 18</b>	<b>18. Common Serologic Tests for Viral Infections:</b> 18.1. Serological tests for HIV 18.1.1. Characteristics, Composition, Structural Genes, Replication and Immunology of HIV 18.1.2. Common HIV Antibody Tests 18.1.3. Current HIV test algorithm 18.1.4. Common HIV Antigen Tests 18.1.5. Western blot 18.1.6. Molecular technique (Viral load) 18.2. Serology of Hepatitis Viruses 18.3. Serology of Infectious mononucleosis 18.4. Serology of Dengue viruses	5hrs
	Laboratory practice on serological diagnosis of HIV and other viral diseases using rapid test kits and ELISA	6hrs
<b>Week 19</b>	<b>19. Serologic test for Autoimmune disease</b> 19.1. Diagnosis of systemic lupus erythematosus 19.2. Serology of Rheumatoid Factor 19.3. Acute-phase reactants/ Acute-phase Proteins (C- reactive protein) 19.4. Serology of Troponin I <b>20. Serology of Human Chorionic Gonadotrophin Hormone (HCG)</b> 20.1. Urine pregnancy tests, factors that affect urine pregnancy test, 20.2. Urine specimen collection 20.3. Methods of determining HCG	5hrs
	Laboratory practice on Rheumatoid Factor and Urine pregnancy tests	6hrs
<b>Week 20</b>	Final examination	

## **21.8. Immunology and Serology Module syllabus**

**Module name: Immunology and Serology**

**Module Code: MeLS-M3233**

**Module EtCTS:10**

**Program: BSc Medical Laboratory Sciences**

**Year: III**

**Module Duration: 20 Weeks**

**Pre-requisite: Basics to Medical Laboratory Science**

**Module Description:** this module deals with the basic concepts of the components and functions of the immune system; associated disorders, principles and procedures of immunological and serological techniques required to perform Immunological and serological tests for the diagnosis of infectious and non-infectious diseases.

### **Module Competencies**

- Perform immunological assays on clinical specimens as per standard operating procedure.
- Perform serological assays on clinical specimens as per standard operating procedure.
- Utilize automated immunologic and serologic equipment
- Interpret report and document laboratory test results correctly.

### **Learning Outcomes**

After completion of this module, students are expected to:

- Describe Components of the immune system
- Explain Physiology of key lymphoid organs
  
- Explain the collection, preparation, preservation and shipment of serologic and Immunologic specimens
- Perform immunologic marker typing on Immune cells
- Discuss Antigen Processing and presentation to T-lymphocytes.
- Explain Maturation, Activation, and Regulation of Lymphocytes
- Explain effector mechanisms of immune responses
- Describe principles and techniques of vaccination
- Describe the disorders the immune system

- List common serological tests for parasitic, bacterial and viral infections.
- Apply basic principles of serological and Immunological techniques for the diagnosis of parasitic, bacterial and viral infections
- Perform quality control tests for serological and immunological assays
- Apply safety precaution in serology and immunology laboratory
- Describe the factors affecting serological and immunological tests in the laboratory
- Perform specific and non-specific tests for syphilis as per the standard operating procedure
- Perform infectious mononucleosis; rheumatoid factor and acute phase protein tests according to procedure
- Practice HIV test and hepatitis tests by applying appropriate algorithms
- Properly interpret, report and document laboratory test results

#### **Teaching-Learning Methods and activities**

- Interactive lecture and discussion
- Facilitated discussion
- Case study

#### **Teaching-Learning Materials and resources**

- Learning guides and checklists
- Text books
- Reference manual
- Posters/Pictures
- Video show
- Demonstration (at skills lab)
  
- Guided laboratory practice
- LCD Projector
- White board marker
- Laptop

#### **Learning Assessment methods (both formative and summative)**

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%

- Test 3: 5-10%
  - Practical Examination: 5-10%
  - Assignment, projects, field reports with presentations: 5-10%
- . Lab reports: 5%
- Oral examination: 5%

## **Module Schedule**

<b>Week</b>	<b>Essential contents and learning methods and Activities</b>	<b>Hours</b>
<b>Week 1</b>	<p><b>21. Introduction to Immunology</b></p> <p>21.1. History of immunology</p> <p>21.2. The immune system</p> <p>21.3. Natural immune system</p> <p>21.4. Adaptive immune system</p> <p><b>22. Cells and organs of the immune system</b></p> <p>22.1. Organs of the Immune system (Primary and secondary)</p> <p>22.2. Cells of the immune system</p> <p>22.3. Types and development of immune cells</p> <p>22.4. Function of immune cells</p>	10hrs
<b>Week 2</b>	<p><b>23. Innate Immune System</b></p> <p>23.1. Anatomical and Physiologic barrier</p> <p>23.2. Innate Immune cell recognition mechanism of pathogen</p> <p>23.3. Inflammation</p> <p>23.4. Phagocytosis</p> <p>23.5. Complement system</p>	10hrs
<b>Week 3</b>	<p><b>24. Major Histocompatibility complex (MHC) and antigen presentation</b></p> <p>24.1. Professional antigen presentation cells</p> <p>24.2. Types of MHC molecule</p> <p>24.3. Types of Antigen</p> <p>24.4. Antigen presentation</p>	10hrs
<b>Week 4</b>	<p><b>25. Adaptive cell mediated immune system</b></p> <p>25.1. T-cell maturation and regulation</p> <p>25.2. T-cell activation and differentiation</p> <p>25.3. Effector mechanism of cell mediated immune cells</p>	10hrs
<b>Week 5</b>	<p><b>26. Adaptive humeral immune system</b></p> <p>26.1. B-cell maturation and Regulation</p> <p>26.2. B-cell Activation and differentiation</p> <p>26.3. Immunoglobulin (structure, class and isotype)</p> <p>26.4. Effector mechanism of humeral immune response</p>	10hrs
<b>Week 6</b>	<p><b>27. Immune response to infectious disease</b></p> <p>27.1. Immune response to parasite infection</p> <p>27.2. Immune response to viral infection</p> <p>27.3. Immune response to bacterial infection</p>	10hrs

	<b>28. Tolerance and Autoimmunity</b> 28.1. The development of central and peripheral tolerance 28.2. Development of autoimmunity 28.3. Types of auto immunity	
<b>Week 7</b>	<b>29. Hypersensitivity reactions (Types I, II, III, IV).</b> 29.1. Type one hypersensitivity 29.2. Type two hypersensitivity 29.3. Type three hypersensitivity 29.4. Type four hypersensitivity <b>30. Immune deficiencies</b> 30.1. Primary immune deficiencies 30.2. Secondary immune deficiencies	10hrs
<b>Week 8</b>	<b>31. Tumor Immunology</b> <b>32. Assessment of immune component function (T-cell, B- cell, phagocytic cells)</b>	10hrs
<b>Week 9</b>	<b>33. Theory of Vaccinology</b> 33.1. History of vaccinology 33.2. Method of vaccine development 33.3. Types of Immunization 33.4. WHO immunization schedule	10hrs
<b>Week 10</b>	<b>34. Immunological and serological techniques</b> 34.1. Overview of immunological and serological techniques 34.2. Laboratory materials & equipment for immunologic and serologic tests 34.3. Laboratory animal handling and management <b>35. Antigen-antibody reaction</b> 35.1. <b>Overview of antibody reaction</b>	7hrs
	<b>Laboratory visit on Instrument in Serology laboratory</b>	3hrs
<b>Week 11</b>	35.2. Primary binding test 35.3. Immunofluorescence, ELISA, Radioimmunoassay	6hrs
	<b>Midterm exam</b>	
<b>Week 12</b>	35.4. Secondary binding tests 35.5. Precipitation Reactions, Agglutination, Complement fixation tests	3hrs

	35.6. Tertiary binding tests	
	<b>Laboratory visit on Instrument in Serology laboratory</b>	6hrs
<b>Week 13</b>	35.7. Flow Cytometer 35.8. ELISA 35.9. Methods of Monoclonal Antibody Production	3hrs
	Laboratory Visit and demonstration on Immunology Laboratory equipment (ELISA, flowcytometry)	6hrs
<b>Week 14</b>	<b>36. Specimen collection and preparation for serological tests</b> 36.1. Safety, specimen collection, preparation, preservation and Shipment of serological specimens. 36.2. Dilution (Serial dilutions and Determination of end point and titer) and Complement inactivation	7hrs
	Laboratory practice on Serum preparation, Serum dilution and pipetting	3hr
<b>Week 15</b>	<b>37. Common Serologic Tests for Bacterial and Parasitic disease</b> 37.1. Serological diagnosis for syphilis 37.1.1. Syphilis (Characteristics of the Organism, Mode of Transmission, Stages of the Disease, Congenital Syphilis, Nature of the Immune Response) 37.1.2. Serological diagnosis of syphilis	4hrs
	<b>Laboratory practice on Serum preparation, Serum dilution and pipetting</b>	6hrs
<b>Week 16</b>	37.2. Agglutination test for febrile diseases 37.2.1. Serological test for Salmonella infection 37.2.2. Serological test for Rickettsial infections 37.2.3. Serology of Streptolysin O (SLO) and Anti- streptolysin O (ASO)	4hrs
	Laboratory demonstration and practice on ASO, RPR and VDRL test for syphilis qualitative and quantitative methods	6hrs
<b>Week 17</b>	37.3. Serological tests for Helicobacter pylori 37.4. Serology test for Malaria 37.5. Serological tests for Leishmaniasis 37.6. Serological tests Toxoplasmosis	5hrs
	<b>Laboratory practice on selected bacterial and parasitic diseases</b>	6hrs

	<b>Demonstration on ELISA</b>	
<b>Week 18</b>	<p><b>38. Common Serologic Tests for Viral Infections:</b></p> <p>38.1. Serological tests for HIV</p> <p>38.1.1. Characteristics, Composition, Structural Genes, Replication and Immunology of HIV</p> <p>38.1.2. Common HIV Antibody Tests</p> <p>38.1.3. Current HIV test algorithm</p> <p>38.1.4. Common HIV Antigen Tests</p> <p>38.1.5. Western blot</p> <p>38.1.6. Molecular technique (Viral load)</p> <p>38.2. Serology of Hepatitis Viruses</p> <p>38.3. Serology of Infectious mononucleosis</p> <p>38.4. Serology of Dengue viruses</p>	5hrs
	Laboratory practice on serological diagnosis of HIV and other viral diseases using rapid test kits and ELISA	6hrs
<b>Week 19</b>	<p><b>39. Serologic test for Autoimmune disease</b></p> <p>39.1. Diagnosis of systemic lupus erythematosus</p> <p>39.2. Serology of Rheumatoid Factor</p> <p>39.3. Acute-phase reactants/ Acute-phase Proteins (C- reactive protein)</p> <p>39.4. Serology of Troponin I</p> <p><b>40. Serology of Human Chorionic Gonadotrophin Hormone (HCG)</b></p> <p>40.1. Urine pregnancy tests, factors that affect urine pregnancy test,</p> <p>40.2. Urine specimen collection</p> <p>40.3. Methods of determining HCG</p>	5hrs
	Laboratory practice on Rheumatoid Factor and Urine pregnancy tests	6hrs
<b>Week 20</b>	Final examination	



## **21.9. Medical parasitology and vector biology module syllabus**

**Module name: Medical parasitology and vector biology**

**Module Code: MeLS-M 2213**

**Module EtCTS: 17**

**Program: BSc in Medical Laboratory Science**

**Year: II**

**Module: 20 weeks**

**Pre-requisite: Basic Medical Laboratory Sciences**

**Module Description:** This module covers introduction to vector biology, identification of arthropod vectors of medical importance and their prevention and control methods. Basic concepts on medical Parasitology; classification of medically important Protozoa, medically important helminths, life cycle, mode of transmission, pathogenesis, clinical manifestations, laboratory diagnosis, prevention and control of medically important parasites; covers different diagnostic techniques used in medical parasitology (principles and techniques for diagnosis of parasitic disease); preparation, processing, proper storage and maintaining quality control of different reagents used in medical parasitological investigations; proper specimen collection, processing, examination and reporting for parasitological tests; apply basic quality control measures in medical parasitology laboratory.

Module Competencies:

- Perform parasitological tests on clinical specimens as per standard operating procedure.
- Practice specimen collection, processing, and analysis during disease outbreak and surveillance according to standard operating procedure
  
- Interpret, report and document laboratory test results correctly

**Learning Outcomes:**

After completion of this module, the student will be able to:

- Discuss the concepts of parasitism, the relationships between parasites and host, between parasites and environment and the cultural and socioeconomic factors affecting the transmission of parasites
- Explain the general epidemiological aspects of parasites that affect human
- Illustrate the life cycle of specific parasites
- List characteristics used to identify helminthic parasites involved in human infections

- Classify parasites having medical significance for human
  - Discuss the concepts of parasitism, the relationships between parasites and host, between parasites and environment and the cultural and socioeconomic factors affecting the transmission of parasites
  - Explain the general epidemiological aspects of parasites that affect human
  - List characteristics used to identify helminthic parasites involved in human infections
  - Describe the general characteristics of Helminthes
  - Explain the classification of Helminthes
  - List the most common medically important Helminthes
  - Describe the life cycle of Helminthes
  - Explain the morphology, epidemiology, pathogenesis and treatment of Helminthes
  - Describe the prevention and control measures of Helminthes
  - Compare and contrast the different techniques used to identify helminths and protozoa
  - Explain laboratory quality assurance in parasitology
  - Define terminologies related to protozoa
  - Describe the general characteristics of protozoa
  - Explain the classification of protozoa
  - List the most common medically important protozoa
  - Describe the life cycle of protozoan parasites
  - Explain the morphology, epidemiology, pathogenesis and treatment of protozoan parasites
  - Describe the prevention and control measures of protozoan infections
  - Apply laboratory quality control in Parasitology laboratory
  - Define some terms relevant to the biology of vector
- 
- List the different type of disease transmission ways by Arthropods
  - Explain the scientific taxonomy of Arthropods (vectors)
  - Describe the external & internal morphology of insect
  - Describe the biology ecology and geographical distribution of insects
  - Compare and contrast the different species of insect involved in disease transmission
  - List the diseases transmitted by each species of insect
  - Perform collection, processing, transportation of parasitological specimens (urine, stool, blood, skin slit, body fluids, tissue biopsy, aspirate)

- Examine parasitological specimens using parasitological techniques
- Prepare permanent smear for the identification of intestinal protozoa
- Prepare reagents to be used in Parasitology
- Identify and apply control and prevention measure of medically important insects
- Adhere and promote safety rules in the laboratory.

### **Teaching-Learning Methods and activities**

- Interactive lecture
- Laboratory Demonstration
- Laboratory practice
- Video show
- Case study

### Teaching and learning materials

- Learning guides and checklists
- Text books
- Reference manual
- Writing board
- Posters/Pictures
- LCD Projector
- White board, marker
- Laptop

### **Reference Books**

1. Awole M., Cheneke W. Medical Parasitology for Medical laboratory Technology students. Upgraded lecture Notes Series .2006.
2. P.L. Chiodini, A.H. Moody and D.W. Manser. Atlas of Medical Helminthology and Protozoology 2nd edition; 2003. Churchill Living Stone.
3. Cheesbrough M. District laboratory practice in tropical countries United Kingdom, Cambridge university press, 2009, part I
4. WHO? Manual of Basic Techniques for a Health Laboratory, 2nd ed; 2003
5. Gillespie S, Pearson R.D. Principles and practice of Clinical Parasitology .John Wiley and Sons Ltd, 2001

Recommended study books

Garcia, Lynne Shore. Diagnostic medical parasitology / Lynne Shore Garcia. — 5th ed. 2007, American Society for Microbiology, Washington.

Learning Assessment methods (both formative and summative)

- o Written cognitive knowledge test (MCQ/essay)
- o Performance assessment in Simulated environment using OSPE
- o Performance assessment in real work setting using
  - Direct observation of practice (DOP)
  - MINI-CEX
  - 360-degree evaluation
  - Review of reflective portfolio
  - Review of works (assignments, projects, ...) completed by students
- o Case study
- o Peer assessment of professional behaviors

Summative assessment

- Mini-evaluation exercise (P-MEX)- Direct observation of student’s professional behaviors= 20 %
- OSPE 20%
- Written cognitive knowledge test using MCQ/essay/case study = 50%
- Review of students’ reflective portfolio = 10%

### Module Schedule

Week	Essential contents and Learning methods and Activities	Hours
<b>Week 1</b>	<b>Interactive lecture on</b> <b>1. Introduction to Medical Parasitology</b> 1.1. Definition of terms 1.2. Features of parasites 1.3. Source of infection 1.4. Mode of transmission (Direct and Indirect)	<b>hrs</b>

	<p>1.5. Routes of transmission</p> <p>1.6. Host parasite inter-relationship</p> <p>1.7. Effect of parasites on the host</p> <p>1.8. Host susceptibility factors</p> <p>1.9. Escape mechanisms of parasites from the immune system</p> <p>1.10. General life cycle of parasites (Direct and Indirect)</p> <p>1.11. General laboratory diagnosis of parasites</p> <p>1.12. Types of specimen (urine, blood, stool, sputum, skin)</p> <p>1.13. Collection and preparation of specimen used for parasitological examination</p> <p>1.14. Preservation of parasites</p> <p>1.15. General techniques used for parasitological examination</p> <p><b>1.15.1. Macroscopic examinations</b></p> <p><b>1.15.2. Microscopic examinations</b></p> <p><b>1.15.3. Wet mount preparation (Saline and Iodine, e.t.c.)</b></p> <p><b>1.15.4. Demonstration of different concentration techniques</b></p> <p><b>1.15.5. Parasite culture, Immunological and other available parasitological techniques</b> Chemical (Occult blood, Bile pigments)</p> <p><b>1.15.6. Xenodiagnosis</b></p> <p><b>1.15.7. Enumeratio of parasites (helminthes and protozoans)</b></p> <p><b>1.15.8. Reporting results</b></p>	
	<p>Laboratory practice on:</p> <ul style="list-style-type: none"> <li>- Collection, preparation and preservation of different parasitological specimens</li> <li>- Preparation different reagent for parasitological techniques</li> </ul>	<b>6.40 hrs</b>
	<p>Self-study</p>	

<b>Week</b>  <b>2</b>	Interactive lecture on:  2. Introduction to helminthes 2.1. Classification of helminthes 2.2. General features of Nematelminthes  3. Intestinal Nematodes: 3.1. Ascaris lumbricoides 3.2. Epidemiology, Morphology, Transmission and life cycle 3.3. Clinical features, Laboratory diagnosis 3.4. Prevention& control  4. Hookworm ( Ancylostoma duodenale and Necator americanus) 4.1. Epidemiology, Morphology, Transmission and life cycle 4.2. Clinical features and Laboratory diagnosis Treatment, 4.3. Prevention& control  5. Enterobius vermicularis 5.1. Epidemiology, Morphology, Transmission and life cycle 5.2. Clinical features and Laboratory diagnosis 5.3. Prevention& control  6. Trichuris trichiura 6.1. Epidemiology, Morphology, Transmission and life cycle 6.2. Clinical features and Laboratory diagnosis 6.3. Prevention & control  7. Strongyloides stercoralis 7.1. Epidemiology, Morphology, Transmission and life cycle 7.2. Clinical features and Laboratory diagnosis 7.3. Prevention& control	<b>6 hrs</b>
	<b>Self study</b>	
	<b>Test 1</b>	
	<b>Laboratory practice on</b>  - Wet mount (saline,eosin, Iodine), Concentration techniques (formol-ether sedimentation, floatation)  - Examination and identification of intestinal parasites	<b>12 hrs</b>

	- Occult blood test (where available)	
<b>Week</b> <b>3</b>	<p>Interactive lecture on:</p> <p>8. Blood and Tissue nematodes</p> <p>8.1. General characteristics , classification</p> <p>9. Wuchereria bancrofti</p> <p>9.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>9.2. Clinical features and Laboratory diagnosis</p> <p>9.3. Prevention &amp; control</p> <p>10. Podoconiosis</p> <p>10.1. Causes and pathogenesis</p> <p>10.2. Epidemiology and Burden</p> <p>10.3. Differential diagnosis with Lymphatic filariasis</p> <p>11. Brugia malayi/timori</p> <p>11.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>11.2. Clinical features and Laboratory diagnosis</p> <p>11.3. Prevention&amp; control</p> <p>12. Loa loa</p> <p>12.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>12.2. Clinical features, and Laboratory diagnosis</p> <p>12.3. Prevention&amp; control</p> <p>13. Onchocerca volvulus</p> <p>13.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>13.2. Clinical features and Laboratory diagnosis</p> <p>13.3. Prevention &amp; control</p> <p>14. Trichinella spiralis</p> <p>14.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>14.2. Clinical features and Laboratory diagnosis</p> <p>14.3. Prevention &amp; control</p> <p>15. Dracunculus medinensis</p>	<b>hrs</b>

	<p>15.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>15.2. Clinical features and Laboratory diagnosis</p> <p>15.3. Prevention &amp; control</p> <p>16. Larva Migrans</p> <p>16.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>16.2. Clinical features and Laboratory diagnosis</p> <p>16.3. Prevention &amp; control</p>	
	<p>Laboratory practice on:</p> <ul style="list-style-type: none"> <li>- Examination and identification of blood and tissue nematodes</li> <li>- Different staining technique for identification of blood and tissue nematode</li> <li>- Serological techniques (where available)</li> </ul>	<b>6:40hrs</b>
	<b>Self study</b>	
<b>Week 4</b>	<p>Interactive lecture on:</p> <p>17. Platyhelminthes (trematode and cestode)</p> <p style="padding-left: 40px;"><b>17.1.1.</b> General characteristics and classifications</p> <p style="padding-left: 40px;"><b>17.1.2.</b> The flukes (Trematodes)</p> <p style="padding-left: 40px;"><b>17.1.3.</b> General characteristics and classifications</p> <p>17.2. Blood flukes</p> <p style="padding-left: 40px;"><b>17.2.1.</b> Schistosoma mansoni</p> <p style="padding-left: 40px;"><b>17.2.2.</b> Epidemiology, Morphology, Transmission and life cycle</p> <p style="padding-left: 40px;"><b>17.2.3.</b> Clinical features and Laboratory diagnosis</p> <p style="padding-left: 40px;"><b>17.2.4.</b> prevention &amp; control</p> <p>17.3. Schistosoma japonicum</p> <p style="padding-left: 40px;">17.3.1. Epidemiology, Morphology, Transmission and life cycle</p> <p style="padding-left: 40px;">17.3.2. Clinical features and Laboratory diagnosis</p> <p style="padding-left: 40px;">17.3.3. Prevention&amp; control</p> <p>17.4. Schistosoma haematobium</p> <p style="padding-left: 40px;">17.4.1. Epidemiology, Morphology, Transmission and life cycle</p> <p style="padding-left: 40px;">17.4.2. Clinical features and Laboratory diagnosis</p> <p style="padding-left: 40px;">17.4.3. Prevention &amp; control</p>	



	<p>17.5. Schistosoma intercalatum and Schistosoma mekongi</p> <p>17.5.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>17.5.2. Clinical features and Laboratory diagnosis</p> <p>17.5.3. Treatment, Prevention&amp; control</p> <p>17.6. Cercarial dermatitis</p> <p>17.6.1. Epidemiology, , Transmission and life cycle</p> <p>17.6.2. Clinical features and Laboratory diagnosis</p> <p>17.6.3. Prevention &amp; control</p>	
	<p>Laboratory practice</p> <ul style="list-style-type: none"> <li>- Concentration Techniques (Sedimentation)</li> <li>- Examination and identification of schistosomes</li> <li>- Different staining technique for identification of schistosomes (where available)</li> </ul>	<b>6:40hrs</b>
	Self study	
<b>Week 5</b>	<p>Interactive lecture on:</p> <p>18. Liver flukes (Clonorchis, Opistorchis, Fasciola)</p> <p>18.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>18.2. Clinical features and Laboratory diagnosis</p> <p>18.3. Prevention&amp; control</p> <p>19. Intestinal flukes (F. buski, H. heterophyes, M. yokogawi)</p> <p>19.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>19.2. Clinical features and Laboratory diagnosis</p> <p>19.3. Prevention &amp; control</p> <p>20. Lung flukes (P. westermani)</p> <p>20.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>20.2. Clinical features and Laboratory diagnosis</p> <p>20.3. Prevention &amp; control</p>	
	<p>Laboratory practice</p> <ul style="list-style-type: none"> <li>- Preparation and examination of specimens for identification of parasites (different flukes)</li> </ul>	6:40hrs
	Self study	

Week 6	<p>Interactive lecture on:</p> <p>21. Tape worms (Cestodes)</p> <p>21.1. General characteristics</p> <p>21.1.1. Taenia Species (Taenia saginata and T. solium)</p> <p>21.1.2. Epidemiology, Morphology, Transmission and life cycle</p> <p>21.1.3. Clinical features and Laboratory diagnosis</p> <p>21.1.4. Prevention &amp; control</p> <p>21.2. Hymenolepis nana</p> <p>21.2.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>21.2.2. Clinical features and Laboratory diagnosis</p> <p>21.2.3. Prevention &amp; control</p> <p>21.3. Hymenolepis diminuta</p> <p>21.3.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>21.3.2. Clinical features and Laboratory diagnosis</p> <p>21.3.3. Prevention &amp; control</p> <p>21.4. Echinococcus granulosus</p> <p>21.4.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>21.4.2. Clinical features and Laboratory diagnosis</p> <p>21.4.3. Prevention&amp; control</p> <p>21.5. Diphylobothrim latum</p> <p>21.5.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>21.5.2. Clinical features and Laboratory diagnosis</p> <p>21.5.3. Prevention &amp; control</p>	7 h r s
	<p>Laboratory practice</p> <p>- Examination of persevered specimens and slides and identification of different cestode parasites</p>	6:40hrs
	Self-study	
	Test 2	

Week 7	<p>Interactive lecture on:</p> <p>22. Introduction to Medical Protozoology</p> <p>22.1. Definition, Diversity &amp; Importance</p> <p>22.2. General Morphology &amp; Structure</p> <p>22.3. Properties, Taxonomy</p> <p>22.4. Sarcodina (Amoebae)</p> <p>22.4.1. Introduction to Sarcodina</p> <p>22.4.2. Taxonomy of Amoeba</p> <p>22.4.3. Pathogenic Amoeba (<i>Entamoeba histolytica</i>):</p> <p>22.4.4. Epidemiology, Morphology, Transmission and life cycle</p> <p>22.4.5. Clinical features, Laboratory diagnosis</p> <p>22.4.6. Prevention &amp; control</p> <p>22.5. Non – Pathogenic Amoeba</p> <p>22.5.1. <i>Entamoeba coli</i>, <i>E. hartmanii</i>, <i>E. polescki</i>, <i>E. gingivalis</i>, <i>E. nana</i>, <i>I. bustchili</i>, <i>E. dispar</i></p> <p>22.5.2. Epidemiology, Morphology, Transmission and life cycle</p> <p>22.5.3. Clinical features and Laboratory diagnosis</p> <p>22.5.4. Prevention &amp; control</p> <p>22.6. Free – living Pathogenic Amoeba</p> <p>22.6.1. <i>Acanthamoeba</i> spp, <i>Naegleria fowleri</i></p> <p>22.6.2. Epidemiology, Morphology, Transmission and life cycle</p> <p>22.6.3. Clinical features and Laboratory diagnosis</p> <p>22.6.4. Prevention &amp; control</p>	6 hrs
	<p>Laboratory Practice</p> <ul style="list-style-type: none"> <li>- Wet mount for direct microscopy (Saline, Iodine, ...)</li> <li>- Staining</li> <li>- Concentration technique for detection of cysts of amoeba</li> </ul>	6:40hrs
	Self study	

Week 8	<p>23. Flagellates (Mastigophora)</p> <p>23.1. Introduction to Flagellates</p> <p>23.2. Intestinal Flagellates</p> <p>23.3. General Characteristics</p> <p>23.4. Giardia lamblia</p> <p>23.4.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>23.4.2. Clinical features and Laboratory diagnosis</p> <p>23.4.3. Prevention &amp; control</p> <p>23.5. Dientamoeba fragilis, Chilomastix mesnili, Enteromonas hominis, Retortamonas intestinalis, Trichomonas hominis, T. tenax</p> <p>23.5.1. General Characteristics, Epidemiology, Morphology, Transmission and life cycle</p> <p>23.5.2. Clinical features and laboratory diagnosis</p> <p>23.5.3. Prevention &amp; control</p> <p>24. Urogenital Flagellates (Trichomonas vaginalis)</p> <p>24.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>24.2. Clinical features and Laboratory diagnosis</p> <p>24.3. Prevention &amp; control</p> <p>25. Blood and tissue flagellates</p> <p>25.1. General Characteristics</p> <p>25.2. Leishmania Species</p> <p>25.2.1. General Characteristics</p> <p>25.2.2. Classification</p>	6 hrs
	<p>Laboratory practice</p> <ul style="list-style-type: none"> <li>- Direct saline/eosin stool examination</li> <li>- Concentration techniques for identification of cysts</li> <li>- Examination of urine, vaginal and urethral swab</li> </ul>	6:40hrs
	Test 3	
Week 9	<p>25.3. Leishmania tropica complex</p> <p>25.3.1. Epidemiology, Morphology, Transmission and life cycle</p>	6 hrs

	<p>25.3.2. Clinical features and Laboratory diagnosis</p> <p>25.3.3. Prevention &amp; control</p> <p>25.4. Leishmania donovani complex</p> <p>25.4.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>25.4.2. Clinical features and Laboratory diagnosis</p> <p>25.4.3. Prevention &amp; control</p> <p>25.5. Leishmania mexicana complex</p> <p>25.5.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>25.5.2. Clinical features and Laboratory diagnosis</p> <p>25.5.3. Prevention &amp; control</p>	
	<p>Laboratory Practice</p> <ul style="list-style-type: none"> <li>- Sample collection</li> <li>- Skin slit smear preparation, staining (Giemsa, Leishman) and examination</li> </ul>	<p>6:40hrs</p> <p>6:40hrs</p>
<p>Week 10</p>	<p>25.6. Leishmania donovani complex, Leishmania mexicana complex, Leishmania braziliensis complex , Leishmania guyanensis complex</p> <p>25.6.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>25.6.2. Clinical features and Laboratory diagnosis</p> <p>25.6.3. Prevention &amp; control</p> <p>26. Trypanosome species</p> <p>26.1. General Characteristics</p> <p>26.2. Classification</p> <p>26.2.1. African trypanosomiasis</p> <p>26.2.2. Epidemiology, Classification, Morphology, Transmission and life cycle</p> <p>26.2.3. Clinical features, Laboratory diagnosis</p> <p>26.2.4. Prevention&amp; control</p> <p>26.3. American trypanosomiasis</p> <p>26.3.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>26.3.2. Clinical features and Laboratory diagnosis</p>	<p>6 hrs</p>

<p>26.3.3. Prevention &amp; control</p>	
<p>Interactive lecture on</p> <p>27. Apicomplexa (Sporozoa)</p> <p>27.1. Classification</p> <p>27.2. General features</p> <p>27.3. Intestinal Sporozoa</p> <p>27.3.1. General features of <i>Cryptosporidium</i> species, <i>Isospora belli</i> and <i>Cyclospora cayentanensis</i></p> <p>27.3.2. Epidemiology, Morphology, Transmission and life cycle</p> <p>27.3.3. Clinical features and Laboratory diagnosis</p> <p>27.3.4. Prevention &amp; control</p> <p>27.4. Blood and tissue sporozoa</p> <p>27.4.1. General features of <i>Plasmodium falciparum</i>, <i>Plasmodium vivax</i>,</p> <p>27.4.1.1. Epidemiology, Morphology, Transmission and life cycle,</p> <p>27.4.1.2. Clinical features, pathogenesis and laboratory diagnosis</p> <p>27.4.1.3. Prevention and control, treatment</p>	
<p>Laboratory practice</p> <ul style="list-style-type: none"> <li>- Sample collection and preparation</li> <li>- Wet mount and modified acid-fast staining for identification of intestinal coccidian</li> <li>- <i>Trypanosoma</i> and <i>Leishmania</i> microscopic examination and serologic tests (DAT, IFAT, ELISA etc...</li> <li>- Thin and tick blood film preparation, staining and examination for the identification of <i>Plasmodium falciparum</i> and <i>P. vivax</i> species</li> </ul>	<p>6:40hrs</p>
<p>Self-study</p>	

Week 11	<p>Interactive lecture on:</p> <p>27.4.2. plasmodium ovale, plasmodium malariae and plasmodium knowlesi</p> <p>27.4.2.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>27.4.2.2. Clinical features, Pathogenesis and laboratory diagnosis</p> <p>27.4.2.3. Prevention and control</p> <p>27.5. Babesia species</p> <p>27.5.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>27.5.2. Clinical features, Laboratory diagnosis</p> <p>27.5.3. Prevention &amp; control</p>	6 hrs
	<p>27.6. Toxoplasma gondii</p> <p>27.6.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>27.6.2. Clinical features, Laboratory diagnosis</p> <p>27.6.3. Prevention &amp; control</p> <p>28. Ciliates (Balantidium coli)</p> <p>28.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>28.2. Clinical features, Laboratory diagnosis</p> <p>28.3. Prevention &amp; control</p>	
	<p>Interactive lecture on</p> <p>29. Microsporidium species (Encephalitozoon hellem Enterocytozoon bienersi, Encephalitozoon intestinalis)</p> <p>29.1. Epidemiology, Morphology, Transmission and life cycle</p> <p>29.2. Clinical features, Laboratory diagnosis</p> <p>29.3. Prevention &amp; control</p>	
	<p>Laboratory practice on:</p> <ul style="list-style-type: none"> <li>- Thin and tick blood film preparation, staining and examination for the identification of plasmodium species</li> </ul>	6:40hrs
	Self study	
	Test	

<p>Week 12</p>	<p>Interactive Lecture on</p> <p>30. Introduction on arthropods</p> <p>30.1. History and classification of arthropods</p> <p>30.2. Definition of terms</p> <p>30.3. Health burden of Arthropods</p> <p>30.4. General characteristics of Arthropods</p> <p>30.5. Arthropod Identification</p> <p>30.6. Biological Functions of arthropods</p> <p>30.7. Ways of disease transmission</p> <p>30.8. Types of metamorphosis</p> <p>30.9. Medically important vectors</p> <p>30.9.1. Mosquitoes (Culicid)</p> <p>30.9.2. Introduction to Mosquitoes (Culicidae)</p> <p>30.9.3. General Characteristics</p> <p>30.9.4. Occurrence of Mosquitoes</p> <p>30.9.5. External Morphology</p> <p>30.10 . Classification of Mosquitoes</p> <p>30.11 . Life cycle, Adult behaviour</p> <p>30.12 . Medical importance, Mosquito control</p> <p>30.13 . Black flies (Simulate)</p> <p>30.13.1. Introduction to black flies</p> <p>30.13.2. General Characteristics, Occurrence of Black flies</p> <p>30.13.3. Medical importance</p> <p>30.14. Tabanidae</p> <p>30.14.1. General Characteristics</p> <p>30.14.2. External Morphology, Classification of tabanids</p> <p>30.14.3. Life cycle, Adult behavior</p> <p>30.14.4. Medical importance, tabanids</p> <p>30.14.5. Control of Tabanids</p> <p>30.15. Fleas (Siphonaptera)</p> <p>30.15.1. Introduction to fleas</p>	<p>6 hrs</p>
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	<p>30.15.2. General Characteristics</p> <p>30.15.3. External Morphology, Classification of Fleas</p> <p>30.15.4. Life cycle, Adult behavior</p>	
	Laboratory practice on: Collection and morphologic differentiation of vectors (mosquito, flies etc...)	6:40hrs
	Self study	
Week 13	<p>30.16. Sand flies (Phlebotaminae)</p> <p>30.16.1. Introduction to sand flies</p> <p>30.16.2. General Characteristics, External Morphology</p> <p>30.16.3. Classification of sand fly</p> <p>30.16.4. Life cycle, Adult behavior</p> <p>30.16.5. Medical importance</p> <p>30.17. Introduction to tsetse fly</p> <p>30.17.1. General Characteristics, External Morphology</p> <p>30.17.2. Classification of tsetse fly</p> <p>30.17.3. Life cycle, Adult behavior</p> <p>30.17.4. Medical importance</p> <p>30.17.5. Tsetse fly control</p> <p>30.18. Biting Midges</p> <p>30.18.1. Introduction to biting midges</p> <p>30.18.2. General Characteristics</p> <p>30.18.3. External Morphology, Classification of biting midges</p> <p>30.18.4. Life cycle, Adult behavior</p> <p>30.18.5. Medical importanceBiting midges control</p> <p>30.19. House fly (Muscidae)</p> <p>30.20. Introduction to house fly</p> <p>30.20.1. General Characteristics</p> <p>30.20.2. External Morphology, Classification of house flies</p> <p>30.20.3. Life cycle, Adult behavior</p> <p>30.20.4. Medical importance</p> <p>30.21. Myiasis and its classification</p>	6 hrs

	<p>30.22. Lice (Anoplura)</p> <p>30.22.1. Introduction to lice</p> <p>30.22.2. General Characteristics</p> <p>30.22.3. External Morphology, Classification of lice</p> <p>30.22.4. Life cycle, Adult behavior</p> <p>30.22.5. Medical importance</p> <p>30.22.6. Lice control</p> <p>30.23. Ticks</p> <p>30.23.1. Introduction to ticks</p> <p>30.23.2. General Characteristics</p> <p>30.23.3. External Morphology, Classification of ticks</p> <p>30.23.4. Life cycle, Adult behaviour</p> <p>30.23.5. Medical importance</p> <p>30.23.6. Ticks control</p> <p>30.24. Mites</p> <p>30.24.1. Introduction to mites</p> <p>30.24.2. General Characteristics</p> <p>30.24.3. External Morphology, Classification of mites</p> <p>30.24.4. Life cycle, Adult behaviour</p> <p>30.24.5. Medical importance</p> <p>30.24.6. Mite control</p>	
	Laboratory practice on: Collection and morphologic differentiation of vectors	6:40hrs
	Self study	
Week 14	<p>30.25. Bed bugs and Triatomine bugs</p> <p>30.25.1. Introduction to bed bugs and triatomine bugs</p> <p>30.25.2. General Characteristics</p> <p>30.25.3. External Morphology, Classification</p> <p>30.25.4. Life cycle, Adult behaviour Medical importance, Bed bugs and triatomine bugs control</p> <p>30.26. Cockroaches</p>	6 hrs

	<p>30.26.1. Introduction to cockroaches</p> <p>30.26.2. General Characteristics</p> <p>30.26.3. External Morphology, Classification of cockroaches</p> <p>30.26.4. Life cycle, Adult behavior</p> <p>30.26.5. Medical importance</p> <p>30.26.6. Cockroaches control</p> <p>30.27. Crustacean</p> <p>30.27.1. Introduction to crustacean</p> <p>30.27.2. General Characteristics</p> <p>30.27.3. External Morphology, Classification of crustacean</p> <p>30.27.4. Life cycle, Adult behavior</p> <p>30.27.5. Medical importance</p> <p>30.27.6. Control of Crustaceans</p> <p>30.28. Mollusks</p> <p>30.28.1. Introduction to mollusks</p> <p>30.28.2. General Characteristics</p> <p>30.28.3. External Morphology, Classification of mollusks</p> <p>30.28.4. Life cycle, Adult behavior</p> <p>30.28.5. Medical importance</p> <p>30.28.6. Snail control</p>	
	Laboratory practice on: Cockroaches, bugs and mollusks	9 hrs
	Self-study	
Week 15-19	Hospital laboratory practicum	24 hrs
	Hospital laboratory practicum	24hrs
	Hospital laboratory practicum	24 hrs
	Hospital laboratory practicum	24 hrs
	Hospital laboratory practicum	24 hrs
Week 20	Written and practical examination	

## **21.10. Clinical Laboratory Attachment I Module syllabus**

**Module Name: Clinical Laboratory Attachment I**

**Module code:MeLS-M2223**

**Module EtCTS: 3**

**Program: Undergraduate BSc in Medical Laboratory Sciences**

**Year: II**

**Module duration: 12Weeks**

**Laboratory Hours:20 hours /week**

**Pre-requisite:** Basic to Medical Laboratory Science, Applied Genetics and Molecular Biology and Medical Parasitology and vector biology modules

### **Course description:**

The student is assigned to hospital laboratory where he/she collects, transports, prepares and preserves biological specimens and performs and interprets basic tests for basic medical laboratory, molecular biology and Medical Parasitology under supervision.

### Module Competency

- Prepare working reagents and solutions
- Collect, prepare, preserve and transport biological specimens from patients for diagnostic tests
- Perform and interpret basic tests for molecular biology and Medical Parasitology under supervision
- Be able to practice/familiarize with the necessary materials/equipment's and reagents associated with molecular biology and parasitological tests

- Apply safety precaution measures
- Apply ethical principles
- Communicate and handle patients properly

### Learning outcome

Upon completion of the module, students will be able to:

- Prepare working reagents and solutions
- Collect, prepare, preserve and transport biological specimens from patients for diagnostic test.
- Perform basic molecular biology and Medical Parasitology techniques

- Interpret basic molecular biology and Medical Parasitology techniques
- Communicate and handle patients properly
- Communicate properly with laboratory staff, peers and other health care workers.
- Familiarize the safe laboratory procedures
- Familiarize how to report laboratory test results
- familiarize for the preparation, proper storage and control of different reagents
- Appreciate the significance of the laboratory test result in the investigations of diseases

Methods of delivery: Hospital Laboratory Attachment.

Assessment:

- Hospital attachment evaluation: 50% (the attachment objectives and evaluation checklist will be prepared by the respective department)
- Case and seminar presentation: 10% (one group should present a seminar every Friday)
- Practical examination: 40%

Total: 100%

## **21.11. Measurement of Health and Disease Module syllabus**

**Module Title: Measurement of Health & Disease (SPH 2)**

**Module Code: SPH-M3232**

**Module EtCTS: 5**

**Program: BSc Medical Laboratory Sciences**

**Year: III**

**Duration: 20 weeks**

**Prerequisite: None**

**Module Description:** This module is designed to equip learners with the knowledge, skills and attitude needed to measure disease and other health conditions in the community for public health action. It is offered during foundations to medicine phase of the year one.

**Module Objective**

At the end of this module, learners will be able to apply public health methods for the measurement of health and disease at population level.

**Learning outcome**

- Explain the notion of health from scientific and layman perspective

- Describe the history, evolution and functions of public health and its relevance to the practice of Medical Laboratory Sciences professional
- Apply epidemiological approach to disease causation with emphasis on infectious diseases
- Apply levels of prevention regarding avoidance and control at different levels
- Apply the different types of epidemiologic studies
- Calculate and interpret measures of morbidity and mortality including from existing data sources
- Apply different methods of data collection in the community
- Apply basic biostatistics concepts, tools and methods
- Describe criteria for establishing and evaluating screening programs and factors that affect validity and reliability of screening tests (K2)
- Describe the processes, uses, and evaluation of public health surveillance (K2)
- Apply the steps of an outbreak investigation and management (K3)
- Discuss epidemiology of diseases of public health significance in Ethiopia and locally (K2)
- Demonstrate clear, sensitive and effective communication skills in interactions with individuals, families, communities, PHCU staff, local health department staff, peers and faculty (S3, A3)
- Suggest health promotion and disease prevention methods for major public health problems (K4)
- Demonstrate professional values and behavior in interaction with individuals, families and communities consistent with the future role of a Medical Laboratory professionals (A3)
- Demonstrate key public health values, attitudes and behaviors such as commitment to equity and social justice, recognition of the importance of the health of the community as well as the individual, and respect for diversity, self-determination, empowerment, and community participation (A3)

- Show respect for colleagues and other healthcare professionals and the ability to foster a positive collaborative relationship with them (A3)
- Analyze community practice experience and perform practice-based improvement activities using a systematic methodology (KAS4)
- Use information technology to manage information, access online medical information, and support one 's own education (KAS3).
- Demonstrate a habit of self-reflection, responsiveness to feedback and an on-going development of new skills, knowledge and attitude (AS3).
- Search, collect, organize and interpret health and health-related information from different sources (S3)
- Use information and communication technology to assist in health promotion and disease prevention measures for individuals and families (S3).

#### Teaching-Learning Methods

- o Interactive lecture and discussion
- o Small group learning activities: assignment, exercise, case study
- o Individual reading
- o PHCU/Community-based learning and study trip: home visit, discussion with individuals and families to identify and solve problems, observation, PHCU visit, Zonal and District Health Department Visit, field visit, and targeted literature review based on community experience
- o Use of computer applications and access to the internet
- o Student presentation
  
- o Personal research and reflection exercise (PRRE)
- o Reflective portfolio and mentoring

#### **Reference Books**

1. Fletcher. Principles of Epidemiology
2. Charles H Hennekens and Julie E Buring. Epidemiology in Medicine
3. Rothman, Kenneth J.; Greenland, Sander; Lash, Timothy L. Modern epidemiology. 3rd edition. 2008
4. David G. Kleinbaum, Kevin M. Sullivan. A pocket guide to epidemiology. 2007

5. Yemane Berhane, Damen Hailemariam and Helmut Kloos. Epidemiology and ecology of health and disease in Ethiopia. 2006
6. Daniel. Biostatistics: a foundation for analysis in health sciences.
7. Pagano. Principles of Biostatistics
8. Colton. Statistics in Medicine
9. Bland. An introduction to Medical Statistics.

Other leaning materials

- o AV aids (LCD and computer or Overhead projector and transparencies, writing board and marker or chalk)
- o Computers with appropriate statistical software like EPI info and SPSS
- o Handouts of lecture materials
- o Logbooks for entry of community experience.

### **Assessment Methods**

Formative assessment

- Exercise and assignment
- 360-degree evaluation
- Student presentation
- Global rating of community experience midway during the module Assessment

1. Class room-based teaching (theory) = 40%

- Written exam (40 %)

2. Community attachment (60 %) along with clinical practice

➤ Review of Reflective portfolio (20%) (Review of works/activities/tasks /projects/assignments etc. completed by students.

➤ Direct observation of performance (individual/group) = 30 %

➤ Other performance (seminar etc.) =10%

### **Module Schedule**



<b>Week</b>	<b>Contents</b>	<b>Time allocated</b>
<b>Week 1</b>	<b>Introduction to public health</b> <ul style="list-style-type: none"> <li>• Health and disease: concepts, definitions and perspectives</li> <li>• Public health: definition, philosophy, history, development, core functions and services</li> <li>• Public health sciences, their scope and use in medicine</li> </ul>	<b>6 Hrs</b>
<b>Week 2</b>	<b>Epidemiological concepts of disease causation (2 hours)</b> <ul style="list-style-type: none"> <li>• Concepts of disease causation</li> <li>• Epidemiological models in disease causation (epidemiological triangle, web of causation, wheel model)</li> <li>• Factors in causation</li> <li>• Time, Place and Person concept in disease causation</li> <li>• Establishing causation</li> <li>• Natural history of diseases (communicable and non-communicable)</li> </ul>	<b>6 Hrs</b>
<b>Week 3</b>	<b>Levels of prevention</b> <b>Screening</b> <ul style="list-style-type: none"> <li>• Definition of screening</li> <li>• Types of screening</li> <li>• Criteria for screening</li> <li>• Factors affecting validity and reliability of screening tests</li> </ul>	<b>6 Hrs</b>
<b>Week 4</b>	<b>Types of epidemiologic studies, their use and limitations</b> <ul style="list-style-type: none"> <li>• Observational and Experimental</li> <li>• Measuring disease frequency (incidence, prevalence)</li> <li>• Using available information to measure health and disease (health information system)</li> </ul>	<b>6 Hrs</b>
<b>Week 5</b>	<b>Types of epidemiologic studies, their use and limitations (continued)</b> <ul style="list-style-type: none"> <li>• Death rates, morbidity and disability measures</li> <li>• Comparing disease occurrence (absolute and relative comparisons, standardization)</li> </ul>	<b>6 Hrs</b>

	<ul style="list-style-type: none"> <li>• Epidemiology of diseases of public health significance in Ethiopia</li> </ul>	
<b>Week 6</b>	<b>Mid-term Exam (test 1)</b>	<b>6 Hrs</b>
<b>Week 7</b>	<b>Handling data</b> <ul style="list-style-type: none"> <li>• Scales of Measurement</li> <li>• Methods of data collection</li> <li>• Presenting and summarizing data</li> </ul>	<b>6 Hrs</b>
<b>Week 8</b>	<b>Handling data (continued)</b> <ul style="list-style-type: none"> <li>• Probability and probability distributions</li> </ul>	<b>6 Hrs</b>
<b>Week 9</b>	<b>Handling data (continued)</b> <ul style="list-style-type: none"> <li>• Sampling and Sampling distributions</li> </ul>	<b>6 Hrs</b>
<b>Week 10</b>	<b>Handling data (continued)</b> <ul style="list-style-type: none"> <li>• Statistical inferences</li> <li>• Point and interval estimation</li> </ul>	<b>6 Hrs</b>
<b>Week 11</b>	<b>Handling data (continued)</b> <ul style="list-style-type: none"> <li>• Hypothesis testing</li> </ul>	<b>6 Hrs</b>
<b>Week 12</b>	<b>Handling data (continued)</b> <ul style="list-style-type: none"> <li>• Sample size determination</li> </ul>	<b>6 Hrs</b>
<b>Week 13</b>	<b>Handling data (continued)</b> <ul style="list-style-type: none"> <li>• Measures of Association</li> <li>• Interpreting and communicating results</li> </ul>	<b>6 Hrs</b>
<b>Week 14</b>	<b>Public health surveillance</b> <ul style="list-style-type: none"> <li>• Principles of public health surveillance</li> <li>• Integrated disease surveillance and response</li> <li>• Timely warning and intervention</li> </ul>	<b>6 Hrs</b>
<b>Week 15</b>	<b>Mid-term exam (test 2)</b>	<b>6 Hrs</b>
<b>Week 16</b>	<b>Outbreak investigation and management</b> <ul style="list-style-type: none"> <li>• Patterns of occurrence of diseases</li> <li>• Disease outbreaks</li> <li>• Steps of investigation of an outbreak</li> <li>• Management and control of an outbreak or epidemic</li> </ul>	<b>6 Hrs</b>

<b>Week 17</b>	<b>Community practice along with Clinical practice</b> <ul style="list-style-type: none"> <li>• Main Objective</li> <li>• To measure health and disease at individual, family and community level</li> </ul>	<b>6 Hrs</b>
<b>Week 18</b>	<b>Community practice along with Clinical practice (continued)</b> <ul style="list-style-type: none"> <li>• Identify and interpret data</li> <li>• Design strategies to promote health and prevent disease</li> </ul>	<b>6 Hrs</b>
<b>Week 19</b>	Direct observation of individual/group performance assessment	
<b>Week 20</b>	Final written examination	

### **21.12. Inclusiveness course syllabus**

**Course Title: Inclusiveness**

**Module EtCTS: 3**

**Target group: BSc in Medical Laboratory Sciences**

**Course code: SNIE-M3241**

**Contact hours: 40 Hours**

**Course offering:** A course should be offered only by certified Special Needs/Inclusive Education Professionals

#### **Course Description:**

In this course, the higher education students will learn how to assess, understand and address the needs of persons with disabilities and vulnerabilities; and provide relevant support or seek extra support from experts. He/she also learns how to adapt and implementing services for an inclusive

environment that aimed to develop holistic development such as affective, cognitive and psychosocial skills of the population with disabilities and vulnerabilities. Identification and removal/management of environmental barriers would find a crucial place in the course. The students learn how to give more attention and support for persons with; hearing impairments, visual impairment, deaf-Blind, autism, physical and health impairments, intellectually challenged, emotional and behavior disorders, learning difficulty, communication disorders, vulnerable persons including gifted and talented, and those at risk due to different reason (persons who are environmentally and culturally deprived, abused, torched, abandoned, and

orphaned.). All college students should be given the chance to study the specific developmental characteristics of each group of persons with disabilities and vulnerabilities. Furthermore, they also identify the major environmental and social barriers that hinder the development of individuals; and come up with appropriate intervention strategies in inclusive settings of their respective professional environment and any development settings where all citizens are equally benefited.

#### Course objective and Expected Learning outcomes

The objective of this course is to develop knowledge, skill and attitude of the learners so that they can provide appropriate services, the tools and strategies that help to create a convenient inclusive environment. This course encourages learners exploring the benefits of collaborating with colleagues to design and implement inclusion in all sphere of life. It also guides the discovery of ways to modify environment as well as services and practices to meet the needs of all persons with disabilities and vulnerabilities in inclusive environment. As a result of reviewing various reading materials, completing the assignments, engaging in related discussions, and strongly working on activities, towards the completion of the course, the students will be able to:

- Identify the needs and potentials of persons with disabilities and vulnerabilities.
- Identify environmental and social barriers that hinder the needs, potentials and full participations, in all aspects of life of persons disabilities and vulnerabilities
- Demonstrate desirable inclusive attitude towards all persons with disabilities and vulnerabilities in full participations
- Apply various assessment strategies for service provisions for evidence-based planning and implementation to meet the needs of persons with disabilities and vulnerabilities
  
- Adapt environments and services according to the need and potential of the persons with disabilities and vulnerabilities
- Utilize appropriate assistive technology and other support mechanisms that address the needs of persons with disabilities and vulnerabilities
- Respect and advocate for the right of persons with disabilities and vulnerabilities
- Collaboratively work with special needs experts and significant others for the life success of all persons with disabilities and vulnerabilities in every endeavor and in all environments.

- Create and maintain successful inclusive environment for persons with disabilities and vulnerabilities
- Promote the process of building inclusive society

### **Approach/Methods/Strategies**

- Interactive lectures
- Cooperative learning
- Brainstorming
- Discussion
- Role play
- Field visits
- Individual and group assignments and presentation
- Seminars
- Individual and group presentations
- Special needs/inclusive education expert consultancy

### **Assessment and Evaluation Methods**

- Tests 10%
- Assignment/group/assignment 10%
- Mid exam 30%
- Final exam 50%

## **Module Schedule**

Chapter Essential contents and learning methods and activities

Chapter 1 1. Understanding Disabilities and Vulnerabilities

1.1. Definitions of disability and vulnerability

1.2. Types of disabilities and vulnerabilities

1.3. Causes of disability and vulnerability

1.4. Historical movements from segregation to inclusion

1.5. The effects of attitude on the move towards inclusion

1.6. Models of disability

## Chapter 2 2. Concept of Inclusion

### 2.1. Definition of Inclusion

### 2.2. Principles of Inclusion

### 2.3. Factors that Influenced Development of Inclusion

### 2.4. Benefits of Inclusion

### 2.5. Features of Inclusive Environment

### 2.6. Barriers to Inclusion

## Chapter 3 3. Identification and Differentiated services

### 3.1. Introduction

### 3.2. Impact of Disability and Vulnerability on daily life

### 3.3. Needs of Persons with Disabilities and Vulnerabilities

### 3.4. Social Needs of Persons with Disabilities and Vulnerabilities

### 3.5. The Health Care Needs of Persons with Disabilities and Vulnerabilities

### 3.6. Disability, vulnerability and the Environment

### 3.7. Impact of the Social and Psychological Environments on the Enabling-Disabling Process

### 3.8. Disability Inclusive Intervention and Rehabilitation Services

### 3.9. Implement Technologies for Disability Inclusion

### 3.10. Implement Inclusive Job Opportunities and Employment

### 3.11. Strategies to Improve Employment for Persons with Disabilities and Vulnerabilities

## Chapter 4 4. Promoting Inclusive Culture

### 4.1. Universal Design

### 4.2. Recruitment, Training, & Advancement Opportunities

### 4.3. Workplace Accommodations and Accessibility: Policy & Practice

### 4.4. Building inclusive community

### 4.5. Means of establish inclusive culture

### 4.6. Inclusive values

### 4.7. Indigenous inclusive values and practices Activity

## Chapter 5 5. Inclusion for Peace, Democracy and Development

### 5.1. Inclusion for Peace

### 5.2. Inclusion for Democracy

5.3. Inclusion for Development

5.4. Respecting divers' needs, culture, values, demands and ideas

Chapter 6 6. Legal frame work

6.1. General Overview of Legal frameworks

6.2. International and National Legal Frameworks

6.3. National Laws and Policy Frameworks

Chapter 7 7. Resources Management for Inclusion

7.1. Introduction

7.2. Provisions of Resources

7.3. Recourses for school children

7.4. Human resources in schools

7.5. School based material resources

7.6. Accommodations

7.7. Organization and Task Completion

Chapter 8 8. Collaborative (Cooperative) Partnerships with stakeholders

8.1. Introduction

8.2. Definition of collaboration, partnership and stack holder

8.3. Key elements of successful collaboration

8.4. General principles of collaboration

8.5. Advantages and challenges of collaboration

8.6. Cooperativeness

8.7. Stakeholder

8.8. Roles of Stakeholders in a Project

8.9. Partnership

## **21.12. Urine and Body Fluid Analysis Module syllabus**

**Module Name: Urine and body Fluid analysis**

**Module Code:MeLS-M3253**

**Module EtCTS: 7**

**Program: BSc Medical Laboratory Sciences**

**Year: IV**

**Module duration: 20 weeks**

**Prerequisites: Basics to Medical Laboratory Science**

### **Module Description:**

This module is designed to equip Medical Laboratory Science students with basic knowledge on overview of anatomy and physiology of urinary system, urine and body fluid formation and composition; collection and preservation of urine and body fluid specimen; physical, chemical and microscopic examination of urine and body fluids; application of quality assurance for laboratory examination of urine and body fluids.

### **Module Competency:**

- Collect, transport, prepare and store biological specimens in accordance with SOPs by complying to ethical standards
- Monitor and maintain performance of laboratory equipment and reagents
- Perform different urine and body fluid analytes, in accordance with SOPs following safety standards
- Interpret record, document and report laboratory test results based on quality standards
- Learning outcomes:
  - After completion of this module, the student is expected to:
    - Describe the urinary system and briefly state their function
    - Collect and preserve urine specimen
    - Perform physical examination of urine
    - Perform chemical examination of urine
    - Perform microscopic examination of urine
    - Identify the different body fluids
    - Perform Body fluid analysis
    - Properly interpret, report and document urine and body fluid analysis test results



- Explain the general principles of Specific toxicity
- Demonstrate analysis of various toxins in clinical specimen
- Register and record patient and reagent details and findings on appropriate registration books and laboratory information system using a standard procedure.
- Promote laboratory safety issues during laboratory practices
- Advocate laboratory quality control in laboratory
- Proper use of SOPs, lab equipment and resources
- Interactive lecture & discussions
- Laboratory Demonstration
- Laboratory practice
- Guided clinical practice

### **Teaching -learning Materials and resources**

- Learning guides and checklists
- Textbooks
- Reference manual
- Writing board
- Posters/Pictures
- LCD Projector
- White board marker
- Laptop

### **Learning Assessment Methods (both formative and summative)**

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Practical Examination: 10%
- Assignment, Projects, field reports with presentations: 10%
- Lab reports: 5%
- Oral examination: 5%

### **References:**

1. Wolde M. Yihdego D. Urinalysis Upgraded Lecture Note for Medical Laboratory Technology Students, Hawassa University, College of Health Sciences, Hawassa2006.

2. Monica C. Medical Laboratory Manual for Tropical Countries, Butterworth-Heinmann Ltd.,1987, Vol.I,II
3. Sood R: Medical Laboratory Technology Methods and Interpretation, 5th ed., New Delhi. Jaypee brothers.1999
4. Wedding M.E, Tienjes S.A: Medical Laboratory Procedures, 2nd ed. Philadelphia, F.A Davis company,1998.
5. Fischbach F: Manual of Laboratory and Diagnostic Tests, 4th ed. Philadelphia J.B. Lippincott company,1988
6. Memmler, Cohen, Wood: The Human body in Health and Disease, 8th ed. Philadelphia, Lippincott,1996
7. Text book of urinalysis and body fluids. Doris LR, Ann EN, 1983 Urinalysis and body fluids: A color text and atlas. Karen MR, Jean JL.1995.

### **Module Schedule**

Week	Essential contents and learning activities	Hours
Week 1	<b>1. Urinary System, Anatomy and Physiology</b> 1.1. The Urinary System 1.2. Anatomy of the Kidney 1.3. Physiology of the Kidney and Formation of Urine 1.4. Composition of Urine and Factors Affecting its Composition 1.5. Renal Clearance and Renal Threshold	3 hrs
Week 2	<b>2. Collection and preservation of urine specimen</b>	3 hrs
	<b>Laboratory Practice on:</b> Specimen collection, processing and preservation	3 hrs
Week 3	<b>3. Physical examination of urine</b> 3.1. Volume 3.2. Color 3.3. Odor 3.4. Foam 3.5. Transparency 3.6. PH 3.7. Specific gravity  <b>4. Chemical examination of Urine</b> 4.1. Types, principles, Clinical significance, sources of errors, interferences, sensitivity/specificity of test reactions 4.1.1. Sugar	3 hrs
	<b>Laboratory practice on:</b> - Physical examination of Urine.	6 hrs
Week 4	<b>Chemical Examination continued</b> 4.1.2. Ketone Bodies 4.1.3. Protein 4.1.4. Bence Jones Protein	3 hrs
	<b>Laboratory Practice:</b> - Chemical examination Urine cont...	6 hrs
Week 5	<b>Chemical examination of Urine Cont...</b> 4.1.5. Hemoglobin 4.1.6. Myoglobin	3 hrs

	<p>4.1.7. Leukocyte esterase</p> <p>4.1.8. Nitrite</p>	
	<p><b>Laboratory practice on:</b></p> <ul style="list-style-type: none"> <li>- Chemical examination of urine cont...</li> </ul>	6 hrs
<b>Week 6</b>	<p><b>Chemical Examination of urine cont...</b></p> <p>4.1.9. Bilirubin</p> <p>4.1.10. Urobilinogen</p> <p>4.1.11. Urobilin</p> <p>4.1.12. Indicant</p> <p>4.1.13. Melanin</p> <p>4.1.14. Ascorbic acid</p>	3 hrs
	<p><b>Laboratory practice on:</b></p> <ul style="list-style-type: none"> <li>- Chemical examination of urine cont...</li> </ul>	6 hrs
<b>Week 7</b>	<p><b>5. Microscopic examination urine</b></p> <p>5.1. Procedure for microscopic examination</p> <p>5.2. Source of errors in the microscopic examination of urine</p> <p>5.3. Body cells (Red Blood Cells, White Blood Cells, and Epithelial Cells)</p>	3 hrs
	<p><b>Laboratory practice on</b></p> <ul style="list-style-type: none"> <li>- Microscopic examination of urine</li> </ul>	6 hrs
	<b>Mid exam</b>	
<b>Week 8</b>	<p><b>Microscopic examination urine cont...</b></p> <p>5.4. Urinary Sediments (Organized Urinary Sediments and Non-Organized Urinary Sediments)</p> <p>5.5. Urinary casts, yeasts, bacteria, sperm cell, parasite</p>	3 hrs
	<p><b>Laboratory practice on:</b></p> <ul style="list-style-type: none"> <li>- Microscopic examination of urine</li> </ul>	6 hrs
<b>Week 9</b>	<p><b>Microscopic examination cont...</b></p> <p>5.6. Urinary crystals</p> <p>5.7. Method of reporting formed elements</p>	3 hrs
	<p><b>Laboratory Practice on:</b></p> <ul style="list-style-type: none"> <li>- Microscopic examination of urine</li> </ul>	6 hrs

<b>Week 10</b>	6. Introduction to body fluids 6.1 Definition of terms 6.2 Types of body fluids 6.3 Over view of formation and physiological role of body fluids 6.4 Clinical usefulness of body fluid analysis	3 hrs
	<b>Laboratory practice on:</b> - Microscopic examination of urine cont...	6 hrs
<b>Week 11</b>	<b>7. Cerebrospinal fluid analysis</b> 7.1 Formation and physiological role of CSF 7.2 Collection of CSF sample 7.3 Routine Laboratory assays of CSF 7.3.1 Gross appearance men, synovial, amniotic etc) 7.3.2 RBC & WBC counts 7.3.3 Chemical and microscopic Examination 7.3.4 Serological Examination	3 hrs
	<b>Laboratory practice on:</b> - Collection and processing body fluids /CSF analysis	6 hrs
<b>Week 12</b>	<b>8. Serous (pleural, pericardial and peritoneal) fluid analysis</b> - Physical, chemical, and microscopic examination Semen, synovial, amniotic	3 hrs
	<b>Laboratory practice on:</b> - Physical, chemical and microscopic examination of CSF, and serous	6 hrs
<b>Week 13</b>	<b>9. Other body fluids</b> <b>9.1 Semen analysis</b> 9.1.1 Formation and physiological role of Semen 9.1.2 Collection of semen specimen 9.1.3 Macroscopic, Microscopic and chemical examination	3 hrs
	<b>Laboratory practice on:</b> - Physical, chemical and microscopic examination of semen, synovial and amniotic fluid	6 hrs

<b>Week 14</b>	<b>9.2 Amniotic fluid</b> 9.2.1 Formation and physiological role of amniotic fluid 9.2.2 Collection of amniotic fluid specimen 9.2.3 Macroscopic, Microscopic and chemical examination	
	<b>Laboratory practice on:</b> - Physical, chemical and microscopic examination of semen, synovial and amniotic fluid	6hrs
<b>Week 15</b>	<b>9.3 Synovial fluid analysis</b> 9.3.1 Physical, chemical, and microscopic examination, synovial, amniotic etc)	6 hrs
	<b>Laboratory practice;</b> - Physical, chemical and microscopic examination of semen, synovial and amniotic fluid	
<b>Week 16</b>	<b>9.4 Morphologic characteristics of cells seen in body fluids</b> 9.4.1 Cells from peripheral blood 9.4.2 Phagocytic cells 9.4.3 Miscellaneous cells	
	<b>Laboratory practice;</b> - Physical, chemical and microscopic examination of semen, synovial and amniotic fluid	
<b>Week 17</b>	<b>9.5 Nasal smear analysis</b> 9.5.1 Eosinophil counts for Asthmatic patients	
	<b>Laboratory practice;</b> - Physical, chemical and microscopic examination of semen, synovial and amniotic fluid	
<b>Week 18</b>	<b>10. Quality assurance in Urine and body fluid analysis</b>	3 hrs
<b>Week 19 - 20</b>	Written and practical examination	

## **21.13. Hematology and Immunoematology**

### **Module Syllabus**

**Module name: Hematology and Immunoematology**

**Module Code: MeLS-M3263**

**Module EtCTS:19**

**Program: BSc in Medical Laboratory**

**Year: III**

**Module Duration: 20 weeks**

**Prerequisite: Basics to Medical Laboratory Science**

**Module Description:** This module is designed to provide adequate knowledge and skill about the role of Hematology Laboratory in Clinical Medicine, the way of blood cell formation, structure and function. The different types, preparation and mode of action of anticoagulants will be addressed. Blood smear preparation, staining and examining after appropriate venous and capillary blood collection. Manual Hemocytometry (total cell count on whole blood and body fluids). And again, it provides adequate knowledge and skill about differential cell counts, Hematocrit, Hemoglobin, Reticulocyte and ESR determination. Moreover identification of normal and abnormal morphology of red blood cells, classification and laboratory diagnosis of anemia, osmotic fragility test of red cells, leukocyte disorders (malignant and nonmalignant), Immunocytochemistry preparation, staining and examination of bone marrow smears, hematological cell markers and methods of determination, an introductory of hemostasis, laboratory aspects of bleeding and coagulation disorders, Lupus erythematosus cell examination and automation in hematology will be covered in this module. It also includes an introduction to

immunoematology; blood group genetics, the antigens and antibodies of the ABO blood group systems, techniques of ABO blood grouping, Rh blood group grouping, ABO and Rh discrepancy resolving. Additionally other clinically important blood group system principles of anti-globulin test, compatibility testing, HDFN and laboratory investigation, blood donor selection and collection of blood from donors, transfusion reactions, preparation of blood components and their storage condition, disease transmitted through blood transfusion and Quality Assurance in Hematology and Immunoematology laboratory will also be covered.

- Module Competencies
- Perform blood collection, processing and storage according to the standard operating procedures
- Perform Hematological and Immunohematology tests on clinical specimens as per standard operating procedures.
- Apply quality assurance in Hematology and immunohematology tests
- Use and maintain automated equipment and instruments capable of performing a number of tests simultaneously.
- Interpret, report and document laboratory test results correctly
- Learning Outcomes
- To meet the above module competencies, the student will be expected to:
- Describe the role of Hematology Laboratory in Clinical Medicine
- Explain the composition of blood
- Comprehends the functions of blood
- Discriminates the morphology of formed elements of blood
- Chooses different types of anticoagulants used in hematology laboratory
- Describe the proportion and mode of action of anticoagulation
- Perform venous and capillary blood collection
- Prepare, stain and examine blood smear
- Discuss the general principles of manual total cell count
- Perform total cell count on whole blood and body fluids
- Define differential leukocyte count
- Discriminate a relative and absolute differential cell counts
  
- Explain reticulocytes
- Trace reticulocyte count on a sample of blood
- Explain the functions of hemoglobin
- Diagrammatically illustrate the structure of hemoglobin
- Discuss the biosynthesis of heme and globin moieties of hemoglobin
- Perform hemoglobin determination
- Explain hematocrit (packed cell volume)
- Measure hematocrit by hematocrit determination methods



- Appraise ESR
  - Recognize the factors that affect ESR
  - Explain the stages in ESR
  - Determine the ESR values
  - Practice the procedure for proper red blood cell examination
  - Analyze the morphology of normal red cells
  - Perform assessment of red cell morphology on a stained blood film
  - Distinguish types of anemia, causes and pathophysiologic mechanisms
  - Differentiate the diagnostic features of anemia
  - Identify the etiology, clinical findings tests used in the diagnosis and treatment of anemias
  - Interpret differential diagnosis of microcytic anemia, macrocytic anemia and normocytic anemia/hemolytic anemias.
  - Perform osmotic fragility test.
  - Discuss hematological malignancies
  - Explain the mechanisms of malignant transformation in hematology
  - Organize the classification of leukemias
- Perform the diagnosis of leukemias
- Distinguish myelodysplastic syndromes and myeloproliferative disorders
  - Compare Hodgkin's and non-Hodgkin's lymphomas
  - Analyze the laboratory diagnosis of malignant lymphoma
  - Explain the principles of cell markers in the diagnosis of hematological malignancies.
  - Perform Bone marrow smear preparation and staining
- Identify LE cells in disease diagnosis
  - Explain the general interaction of the components of hemostasis
  - Discuss the physiological role of the coagulation phase within the hemostatic mechanism
  - Diagram the intrinsic, extrinsic, and common pathway mechanisms of coagulation, including all factors involved in the reactions
  - Appraise the physiological role of the fibrinolytic system
  - Characterize main components of the fibrinolytic system and the function of each
  - Perform PT and APTT tests

- Perform automation for hematological tests and quality control.
- Describe the basic concepts of Immunohematology
- Discuss blood group antigens and antibodies
- Detection of blood group antigens and antibody reactions
- Perform ABO and Rh phenotyping
- Resolve ABO and Rh discrepancy
- Proposes minor blood group phenotyping
- Proceeds Anti-globulin test
- Practices compatibility (cross-match) testing
- Explain hemolytic diseases of the fetus and newborn and its laboratory investigation (HDFN)
- Summarizes the criteria of donor selection for blood transfusion
- Perform transfusion transmitted disease screening
- Apply the principles of collection, transportation, processing and preservation of blood and blood components for transfusion
- Prepare blood components, and derivatives for transfusion.
- Properly interpret, report and document laboratory test results
- Apply concept of quality assurance to hematology and Immunohematology

#### Teaching-Learning Methods and activities

- ✓ Interactive lecture
- ✓ Video show
- ✓ Laboratory Demonstration (Skill lab)

- ✓ Case study
- ✓ Laboratory practice
- ✓ Laboratory visit

#### Teaching-Learning Materials and resources

- Learning guides and checklists
- Text books
- Reference manual

- Writing board
- Posters/Pictures
- LCDP projector
- White board marker
- speakers
- Laptop

Learning Assessment methods (both formative and summative)

- Written Examination (Final, continues. . )
- Practical Examination
- Assignment, Projects, field reports, Presentation
- Oral examination
- Lab reports

Summative Assessment

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Test 3: 5-10%
- Practical Examination: 5-10%
- Assignment, Projects, field reports with presentations: 5-10%
- Lab reports: 5%
- Oral examination: 5%

### **Reference Books**

1 Mary L. Tungeon. Clinical Hematology: Theory and Procedures. 5th ed. 2012

2 Elaine M. Keohane, Catherine N. Otto, Jeanine M. Walenga. Rodaks Hematology: Clinical Principles and Applications. 6th ed., 2020

3 Betty Ciesla. Hematology in practice. 1st ed. 2007

4 John P. Greer, Daniel A. Arber, Bertil E. Glader, Alan F. List, Robert T. Means, George M. Rodgers. Wintrobe's Clinical Hematology. 14th ed. 2019

5. Kathy D. Blaney, Paula R. Howard. Basic and applied concepts of Immunohematology. 2nd ed., 2009

6 Christopher D. Hillier et al. Blood Banking and Transfusion Medicine: Basic Principles

and Practice. 2nd ed. 2007

7 Safe blood donations, Module 1 WHO. 2002

8 Screening for HIV and other infectious agents, Module 2, WHO. 2002

9 Blood group serology, Module 3 WHO. 2002

10 Guidelines and principles for safe blood transfusion practice. Introductory module. WHO 2002.

11 Immunohematology: Principles and Practice Quinley, 2nd ed. 1998. AABB Technical Manual. 15th Edition. 2005.

12 Hoff brand, Moss and Pettit JE. Essential Hematology. Blackwell Science, Oxford, 5th Ed. 2007.

13 Sheryl A. Whitlock Immunohematology for Medical Laboratory Technicians, 2010

14 Yayehyirad T. and Misganaw B. Immunohematology Lecture Note for medical Laboratory science students. Upgraded lecture note. 2008

15 Yarde Alemu. Hematology Lecture Note for medical laboratory technology students Lecture note series; 2006.

### **Module Schedule**

Week	Essential contents and Learning methods and Learning Activity	Hours allocated
Week 1	<p><b>1. Overview of Hematology (2 Hrs)</b></p> <p>1.1 The role of Hematology laboratory in clinical Medicine</p> <p><b>2. Composition, formation and function of blood (6 Hrs)</b></p> <p>2.1 Composition of blood</p> <p>2.2 Characteristics of Blood</p> <p>2.3 Function of Blood</p> <p>2.4 Formation and regulation of blood cells production</p> <p>2.5 Sites of Hemopoiesis</p> <p>2.6 The hemopoiesis microenvironment</p> <p>2.7 Regulation of hematopoiesis</p> <p>2.8 Maturation characteristics</p>	8 Hrs
Week 2	<p><b>3. Anticoagulants types, preparation and mode of action (3</b></p>	7 Hrs

	<p><b>Hrs)</b></p> <p><b>4. Whole blood collection (4 Hrs)</b></p> <p><b>4.1. Venous blood collection</b></p> <p><b>4.2. Capillary blood collection</b></p>	
	<p><b>Laboratory practice on:</b></p> <ul style="list-style-type: none"> <li>• Anticoagulant preparation</li> <li>• Blood collection</li> </ul>	<b>10 Hrs</b>
<b>Week 3</b>	<p><b>5. Blood smear preparation, staining and Examination</b></p> <p>5.1. Preparation of thin and thick blood film</p> <p>5.2. Staining principle</p> <p>5.3. Romanowsky Stains</p> <p>5.4 Panoptic stain</p> <p>5.5 Staining Problems</p> <p>5.6 Microscopic Examination of Blood Films</p>	<b>8 Hrs</b>
	<p><b>Laboratory practice on:</b></p> <p>Blood smear preparation, staining and microscopic examination of stained blood film</p>	<b>12hrs</b>

<b>Week 4</b>	<p><b>6. Manual total Blood cell count (6 Hrs)</b></p> <p>6.1 White Blood Cell (WBC) Count</p> <p>6.2 Red blood cell (RBC) count</p> <p>6.3 Platelet count</p> <p>6.4 Eosinophil count</p> <p>6.5 Reticulocyte count</p>	
	<p><b>Laboratory Practice on:</b></p> <ul style="list-style-type: none"> <li>• Manual cell count</li> </ul> <p>Differential cell count</p>	<b>12 hrs</b>
<b>Week 5</b>	<p>7. Hematocrit (2 Hrs)</p> <p>8. Hemoglobin (4 Hrs)</p> <p>9. ESR Determination (2 Hrs)</p> <p>10. Reticulocyte count (1Hr)</p> <p>11. ESR Determination (2 hrs)</p>	<b>8hrs</b>
	<p><b>Laboratory Practice on:</b></p> <ul style="list-style-type: none"> <li>• Hemoglobin determinations</li> <li>• Hematocrit measurement</li> <li>• ESR determination</li> </ul>	<b>8 hrs</b>
	<b>First test (20%)</b>	
<b>Week 6</b>	<p>12. Red blood cell Indices (1Hrs)</p> <p>13. Body fluid cell count (2 Hrs)</p>	<b>7 hrs</b>

	<p>14. Red cell Morphology study (4Hrs)</p> <ul style="list-style-type: none"> <li>• Variation in Red cell size</li> <li>• Variation in Red cell color</li> <li>• Variation in Red cell shape</li> <li>• Red cell inclusions</li> <li>• Variation in Red cell distribution</li> <li>• Grading red cell morphology</li> </ul>	
	<p><b>Laboratory practice on:</b></p> <ul style="list-style-type: none"> <li>• Cell count in body fluid</li> <li>• Red cell Morphology</li> </ul>	<b>7 hrs</b>
<b>Week 7</b>	<p>15. Anemia (6Hrs)</p> <ul style="list-style-type: none"> <li>• Introduction to Anemia</li> <li>• Classification of anemia</li> <li>• Diagnosis of anemia</li> </ul>	<b>6 hrs</b>
	<p><b>Laboratory practice on:</b></p> <ul style="list-style-type: none"> <li>• Anemia diagnosis</li> </ul>	<b>6 hrs</b>
<b>Week 8</b>	<p><b>16. Osmotic fragility tests</b></p> <ul style="list-style-type: none"> <li>• Types of anemia <ul style="list-style-type: none"> <li>• Microcytic Hypo chromic anemias</li> <li>• Macrocytic Normo chromic anemias</li> <li>• Normocytic Normo chromic anemias</li> </ul> </li> </ul> <p><b>Laboratory Practices on</b></p> <ul style="list-style-type: none"> <li>• Types of anemia</li> <li>• Osmotic fragility tests</li> </ul>	<p><b>2 hrs</b></p> <p><b>8 hrs</b></p>



<b>Week 9</b>	<b>17. Leukocyte disorders: (8 Hrs)</b> 17.1. Non - Malignant 17.2. Quantitative abnormality 17.3. Qualitative abnormality 17.4. Hematological Malignancy (Leukemia, Definition and classification of leukemia, laboratory features)	<b>8 Hrs</b>
	<b>Laboratory practice</b> <ul style="list-style-type: none"> <li>Demonstration of leukemia as well as other non-malignant slides interpretation and reporting.</li> </ul>	<b>9 Hrs</b>
<b>Week 10</b>	<b>18. Acute Myeloid Leukemia (3 Hrs)</b> <b>19. Acute and Chronic Lymphocytic Leukemia/Lymphomas (5 Hrs)</b> <b>Myeloma (3 Hrs)</b>	<b>11 Hrs</b>
	<b>Laboratory practice on:</b> Microscopic examination of different leukemia	<b>8 Hrs</b>
<b>Week 11</b>	<b>20. Myelodysplastic syndrome (3 Hrs),</b> <b>21. Myeloproliferative disorders (5 Hrs)</b>	<b>8 Hrs</b>
	<b>Laboratory practice on</b> <b>22. Microscopic examination of different leukemia (continued)</b>	<b>6 Hrs</b>
<b>Week 12</b>	23. Preparation, staining and examination of bone marrow smears (3 Hrs) 24. Leukocyte Cytochemistry (3 Hrs) 25. Hematological cell markers and methods of determination of the markers (3 Hrs)	<b>9 Hrs</b>

	<p><b>Laboratory practice</b></p> <p>Demonstration on preparation and examination of B.M smear</p>	<b>6 Hrs</b>
<b>Week 13</b>	<p><b>26. Hemostasis and disorders of coagulation</b></p> <p>26.3. Introduction to hemostasis (1 Hr)</p> <p>26.4. Components of coagulation system (3 Hrs)</p> <p>26.5. Bleeding and coagulation Disorders (3 Hrs)</p> <p>26.6. Laboratory diagnosis of Bleeding and Coagulation Disorders (3 Hrs)</p> <p>(BT, Blood coagulation time test, Clot retraction time, PT with INR APTT, thrombin time, Fibrinogen Assay, D- Dimer assay ...)</p>	<b>10 Hrs</b>
	<p><b>Laboratory practice on</b></p> <p>Bleeding time test - Coagulation time, PT/INR and APTT</p>	<b>6 Hrs</b>
<b>Week 14</b>	<p>27. Lupus Erythematous cell preparation and examination (2 Hrs)</p> <p>28. Automation in hematology (4 Hrs)</p> <p>29. Quality assurance and reference ranges determination in hematology (2 Hrs)</p>	<b>8 Hrs</b>
	<p><b>Laboratory practice</b></p> <p>Demonstration and practice on Hematology analyzer</p>	<b>8 Hrs</b>
<b>Week 15</b>	<p><b>30. Introduction to Immunohematology (7 Hrs)</b></p> <p><b>30.3.</b> Overview of immunohematology</p> <p>30.4. History of blood transfusion</p> <p>30.5. Blood group genetics</p> <p>30.6. Secretors and non-Secretors</p> <p>30.7. Blood group antigens and Blood group</p>	<b>7 Hrs</b>

	antibodies 30.8. Detection of antigens and antibodies	
<b>Week 16</b>	<b>31. The ABO blood group system (9 Hrs)</b> 31.3. The discovery of ABO blood group 31.4. Genes of ABO blood group system 31.5. The role of H-gene in the expression of ABO Antigens 31.6. The Bombay phenotype and Para Bombay phenotype 31.7. Antigens and antibodies of the ABO blood group system 31.8. ABO phenotyping, Anomalous result in ABO testing	<b>9 Hrs</b>
	<b>Laboratory Practice on</b> Demonstration of antigen and antibody's reaction	<b>6 Hrs</b>
	<b>Second Test (20%)</b>	
<b>Week 17</b>	<b>32. The Rh-Hr blood group system (7 Hrs)</b> <ul style="list-style-type: none"> <li>▪ Historical back ground of Rh-Hr. blood group system</li> <li>▪ Nomenclature and genetic theories</li> <li>▪ The antigens and antibodies of the Rh-Hr.</li> </ul>	<b>8 Hrs</b>

	<p>blood group system</p> <ul style="list-style-type: none"> <li>▪ The antibodies of the Rh-Hr. blood group system</li> <li>▪ Method of Rh typing</li> </ul> <p><b>33. Resolving ABO and RH discrepancy (1 Hr)</b></p>	
	<p><b>Laboratory practice</b></p> <ul style="list-style-type: none"> <li>▪ ABO phenotyping</li> <li>▪ Red cell suspension preparation and perform Rh grouping</li> <li>▪ Resolving ABO and Rh discrepancy</li> </ul>	<b>12 Hrs</b>
<b>Week 18</b>	<p><b>34. Other minor blood group systems (2 Hrs)</b></p> <p><b>35. The anti-globulin test (Coomb's test) (1 Hr)</b></p> <p>35.3. The direct anti-globulin test (DAT)</p> <p>35.4. The indirect anti- globulin test (IAT)</p> <p><b>36. The cross match (Compatibility testing) (3 Hrs)</b></p> <ul style="list-style-type: none"> <li>▪ Purpose of cross-match</li> <li>▪ Type of cross-match</li> <li>▪ Selection of blood for cross-match</li> <li>▪ Methods of cross-matching)</li> </ul> <p><b>37. The donation of blood (2Hrs)</b></p> <p>37.3. Selection of blood donor</p> <p>37.4. Collection of blood</p> <p>37.5. The preservative solutions</p>	<b>8 Hrs</b>
	<p><b>Laboratory practice on</b> Coomb's test (DAT, IAT), Compatibility test</p>	<b>12 Hrs</b>
	<b>Third Test (20%)</b>	

<b>Week 19</b>	<b>38. Preparation, storage and clinical indication of blood and blood products(2Hrs)</b> <b>39. The transfusion reaction (4hrs)</b> 39.3. Type of transfusion reaction Laboratory test to be done when transfusion reaction occurs <b>40. Hemolytic disease of the fetus and the new born (HDFN) and laboratory investigation (3Hrs)</b> <b>41. Quality assurance in immunohematology(3Hrs)</b>	<b>12 Hrs</b>
	<b>Laboratory Practice on:</b> <ul style="list-style-type: none"> <li>▪ Component preparation and Lab investigation of HDFN</li> <li>▪ Supervision component Preparation</li> </ul>	<b>6 Hrs</b>
<b>Week 20</b>	Written and practical examination	

#### **21.14. Health promotion and Disease Prevention module syllabus**

**Module name: Health Promotion and Disease Prevention (SPH-3)**

**Module Code: SPH-M3272**

**Module EtCTS: 3**

**Program: BSc Medical Laboratory Sciences**

**Year: III**

**Module Duration:**20 weeks

Prerequisite: (1) Measurement of Health and Disease and (2) Determinants of Health

Module Description: The module is designed to equip learners with the knowledge, skills and attitude needed to promote health and prevent disease in individuals, families and population.

#### **Module Objective**

At the end of this module, medical students will be able to apply principles and methods of health promotion to improving the health of a population

## **Supporting Objectives**

- Describe the history and evolution of health promotion, including the relationships between health education, health promotion and public health
- Discuss the concepts and models of disease prevention and health promotion
- Illustrate the contribution of the social sciences to health promotion theory and practice
- Identify priority action areas for health promotion in Ethiopia
- Describe the epidemiology of emergency & critical illnesses globally and nationally
- Analyze health problems in their social context of Laboratory
- Apply methods of nutritional assessment and interpret results
- Describe evidence-based strategies to improve nutrition of individuals and population
- Describe evidence-based strategies to improve community health
- Describe national reproductive health and nutrition strategies
- Describe health promotion programs in Ethiopia
- Describe application of different health education related theories in designing and assessing behavior change
- Describe the planning of health education in the context of the Precede-Proceed Mode
- Describe the concepts of empowerment, participation, social capital, and capacity building
- Identify barriers for the implementation of health education in individuals and population groups, based on theories of diffusion and social change
- Identify appropriate health promotion measures effective for health problems of public health significance in Ethiopia
- Demonstrate the ability to promote the health of populations by influencing lifestyle, nutrition and socio-economic, physical and cultural environment through methods of health promotion, including health education, directed towards populations, communities and individuals
- Demonstrate the ability to plan, implement and evaluate health promotion activities
- Demonstrate the ability to communicate effectively in writing and orally with linguistic and cultural proficiency
- Apply communication and group dynamic strategies in interactions with individuals and groups

- Demonstrate the ability to use effective communication for healthcare advocacy
- Demonstrate clear, sensitive and effective communication skills in interacting with individuals, families, PHCU staff, peers and faculty
- Advise individuals and families to promote health and prevent illness
- Demonstrate professional values and behavior in interaction with individuals, families and communities consistent with the future role of a physician
- Demonstrate key public health values, attitudes and behaviors such as commitment to equity and social justice, recognition of the importance of the health of the community as well as the individual, and respect for diversity, self-determination, empowerment, and community participation
- Show respect for peers and other healthcare professionals and the ability to foster a positive collaborative relationship with them
- Analyze community practice experience and perform practice-based improvement activities using a systematic methodology
- Demonstrate a habit of self-reflection, responsiveness to feedback and an on-going development of new skills, knowledge and attitude
- Search, collect, organize and interpret health and health-related information from different sources
- Use information and communication technology to assist in health promotion and disease prevention measures for individuals and families

#### Teaching-Learning Methods

- Interactive lecture and discussion
- Small group learning activities: assignment, exercise, case study, roleplay
- Individual reading
- PHCU/Community-based learning and study trip: home visit, discussion with individuals and families to identify and solve problems, observation, health education, PHCU visit, Zonal and District Health Department Visit, field visit, and targeted literature review based on community experience
- Seminar presentation
- Personal research and reflection exercise (PRRE)
- Reflective portfolio and mentoring

## **Assessment Methods assessment**

- Exercise and assignment
- Logbook and portfolio
- 360-degree evaluation
- Student presentation
- Global rating of community experience midway during the module Summative assessment
- Written exam (40%)
- PRRE1 (15 %)
- Reflective portfolio (15%)
- Global rating of community experience (15%)
- Assignment and/or student presentation (15%)

## **References:**

1. Carl Fertman and Diane Allensworth. Health promotion programs: from theory to practice.2010
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3. Jackie Green,Keith Tones.Health promotion: planning and strategies.2010.
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6. Goeffrey P Webb. Nutrition. A health promotion approach. 3rdedition.
7. Michael J. Gibney,Prof. Susan A. Lanham ,Aedin Cassidy ,Hester H. Vorster. Introduction to human nutrition. 2nd edition. 2009
8. Denis M Medeiros, Robert E.C. Wildman . Advanced human nutrition. 2nd edition.2011
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15. Salem,R.M., Bernstein, J., Sullivan,T.M.,and Lande, R. —Communication for Better Health, || Population Reports, Series J, No. 56. Baltimore, INFO Project, Johns Hopkins Bloomberg School of Public Health, January 2008.Available online:<http://www.populationreports.org/j56/>
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17. de Fossard, E., and Lande, R.—Entertainment-Education for Better Health, INFO Reports, No. 17. Baltimore, INFO Project, Johns Hopkins Bloomberg School of 172 Public Health, January 2008. Available online at: <http://www.infoforhealth.org/inforeports/>
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## **Module Schedule**

Content	Time
<p>1. History, concepts, aims and principles of health promotion and health education</p> <ul style="list-style-type: none"> <li>• History and evolution of health promotion and health education</li> <li>• Concepts of health promotion and health education</li> <li>• Health education in PHC</li> <li>• Health education in Ethiopia</li> <li>• Basic principles of health education</li> <li>• Aims of health education</li> <li>• Contribution of social sciences to health promotion</li> </ul>	<p>2 hours of classroom activities</p> <p>4 hours of community-based learning</p>
<p>2. Application of health education theories and models in behavior change</p> <ul style="list-style-type: none"> <li>• Human behavior and health</li> <li>• Health education theories and models <ul style="list-style-type: none"> <li>➤ Health Belief Model</li> <li>➤ Social Learning Theory</li> <li>➤ Stages of Change</li> <li>➤ Diffusion of Innovation Theory</li> <li>➤ Theory of Planned Behavior</li> </ul> </li> </ul>	<p>4 hours of classroom activities</p> <p>2 hours of student presentation</p> <p>10 hours of community-based learning</p>
<p>3. Health communication</p> <ul style="list-style-type: none"> <li>• Concepts and principles of health communication</li> <li>• Communication model and process</li> <li>• Individual and group communication strategies</li> <li>• Effective communication skills</li> </ul> <p>Barriers of communication</p>	<p>4 hours of classroom activities</p> <p>6 hours of community- Based learning</p>
<p>4. Planning, implementing and evaluating health education</p> <ul style="list-style-type: none"> <li>• Methods and materials for health education</li> <li>• Adult learning theories</li> <li>• Peer education</li> <li>• Conducting health education</li> <li>• Evaluating health education</li> </ul>	<p>4 hours of classroom activities</p> <p>4 hours of community- Based learning</p>
<p>5. Health education in different settings</p> <ul style="list-style-type: none"> <li>• Patient education</li> </ul>	<p>2hours of classroom activities</p>

<ul style="list-style-type: none"> <li>• School health education</li> <li>• Prison health education</li> </ul>	4 hours of community- based learning
6. Health promotion principles <ul style="list-style-type: none"> <li>• Health perspectives and choice of strategies to address health issues</li> <li>• Models and theories of health promotion (PRECEDE-PROCEED Model)</li> <li>• Principles of advocacy</li> <li>• Principles of social marketing</li> <li>• Principles of social/community mobilization</li> <li>• Community diagnosis</li> </ul>	4 hours of classroom activities 4 hours of community-based learning
7. Nutrition and health <ul style="list-style-type: none"> <li>• Introduction to human nutrition</li> <li>• Mechanisms and principles underlying nutritional health, and malnutrition</li> <li>• Nutritional requirements at different stages of the life cycle</li> <li>• Common food sources of nutrients and nutritional anthropology in Ethiopia</li> <li>• Assessment of dietary intake</li> <li>• Assessment of nutritional status</li> <li>• Epidemiology and consequences of malnutrition in Ethiopia</li> <li>• Macronutrient deficiencies of public health importance in Ethiopia</li> <li>• Micronutrient deficiencies of public health importance in Ethiopia</li> <li>• Public health interventions to address malnutrition (e.g., Nutritional surveillance)</li> <li>• Food and nutrition policies and programs in Ethiopia</li> </ul>	8 hours of classroom activities 8 hours of community-based learning
Community practice along with Clinical practice	

<p>Main Objective</p> <ul style="list-style-type: none"> <li>• Promotion of community health</li> <li>• Prevention of disease</li> </ul> <p>N.B. students are required to identify measure health problems (their deterrents), measure health and disease in the community, design strategy to implement health promotion and disease prevention</p>	
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### **21.15. Histopathology Module Syllabus**

#### **Course syllables for Histopathology modules**

**Module Title: Histopathology**

**Module Code: MeLS-M3283**

**Module type: Core**

**EtCTS: 3**

**Mode of delivery: Parallel**

**Pre-requisite: None**

**Year: III**

#### **Module description**

• This module is designed to equip students with overview of introduction to pathologic tissue reactions and changes, basic knowledge and skills of diagnostic techniques in histopathology; handling, marking, preserving, shipment, record keeping Preparation and processing of clinical samples. It gives more emphasis on histopathological techniques;

fixation and fixative, tissue processing, tissue sectioning, staining and

Immunocytochemistry for histopathological diagnosis and other pathology examination methods.

Module objectives

• At the end of this module the students will able to describe the basic concepts of histopathology and cytotechnology, and apply Cytohistopathological techniques in the diagnosis of tissue abnormality.

Supporting objectives:

1. Describe Cyto histopathology
2. Discuss pathologic changes in cells and tissues
3. Discuss the significance of cyto-histopathological examinations
4. Explain the different types of specimens in cytology and histopathology (pathology) lab
5. Explain methods of preservation of the various pathological specimens
6. Perform sample handling, processing, preservation, transporting and staining
7. Perform cell concentration and fixation techniques
8. Prepare histopathological smears and Stains
9. Apply quality assurance system in histopathological investigation
10. Comply safety measures in histopathological investigation

Duration:20 weeks

Teaching and learning methods

1. Interactive lecture and group discussion
2. PBL
3. Video show/interactive animation
4. Biomedical science/Clinical skills lab
5. Hospital/community attachment
6. Seminar presentation

Teaching and learning methods and activities

- Interactive lecture
- Problem based learning
- Video show
- Laboratory Demonstration

- Guided clinical practice
- Laboratory practice
- Clinical attachment

Teaching and learning materials and recourses

- Printed Materials (Procedural Manual, SOP, Checklist, etc.)
- Text books
- Reference manual
- Writing board

- Posters/Pictures
- LCD Projector
- White board marker
- Speakers
- Laptop
- Different laboratory equipment's & materials (microscope, different staining regents, Slide, Microtome, chemical like formaldehyde etc.,)

Learning Assessment methods (both formative and summative)

- Written Examination (Final, continues. )
- Practical Examination
- Assignment, Projects, field reports, Presentation
- Oral examination
- Lab reports

Summative Assessment

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Practical Examination: 5%
- Assignment, Projects, field reports with presentations: 10%
- Lab reports: 5%
- Oral examination: 0-5%

### **Reference Books**

1. John D, Marilyn G. Theory and Practice of Histopathological techniques. 5thed.
2. S. Kim Suvarna, Christopher Layton, John D. Bancroft. Theory and Practice of Histological Techniques. 7th ed. 2013
3. Elaine N. Marieb, Patricia Brady Wilhelm, Jon Mallatt. Human Anatomy. 6th ed., 2012
4. Abul K. Abbas, Adrew H. Lichtman. Cellular and molecular immunology, 5th ed.2003.
5. Basic pathology. 6th ed. 1997
6. Berhanu S, Jemal Y. Histopathology lecture note series, Haramaya University,2007.
7. Bolon B, Anthony DC,Butt M, Dorman D, Green MV,Little PB,et al. Current Pathology Techniques| Symposium Review: Advances and Issues in Neuropathology. ToxicolPathol.

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8. Hurland TJ. Handbook of Histopathological Techniques. Second Edition. Can Vet J. 1967 Jan;8(1):16.

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10. Bancroft, J.D. and Stevens, A.: theory and practice of histological techniques ed.3, Churchill livingstoneinc. 1990. Edinburgh. London, Melbourne and NewYork.

11. Lillie R.D. Histopathologic technique and practice histochemistry ed.3, New York,1965 McGraw Hill Book co.

12. Manual of histologic and special staining techniques 2nd ed. , New York, 1960, The Blakiston Division McGraw Hill Book Co.

Module Schedule

Week	Essential content and learning Activities	Hour
Week 1	1. Introduction to Histopathology 1.1. Cytology 1.2. Histology 1.3. pathology 2. Type of tissue <ul style="list-style-type: none"> <li>▪ Classification</li> </ul>	3 hrs
Week 2	3. Type of tissue(continued) <ul style="list-style-type: none"> <li>▪ Organization of tissue</li> <li>▪ Prosperity of tissue</li> <li>▪ Function of tissue</li> </ul>	3hrs
Week 3	4. Cellular/tissue changes <ul style="list-style-type: none"> <li>• Reversible changes</li> <li>• Irreversible changes</li> </ul> 5. Aspects of disease process (Etiology, morphology, pathogenesis and manifestation)	3 hrs
Week4	6. Neoplasia 7. Inflammation	3 hrs
Week 5	8. Introduction to Histopathology techniques 8.1. Samples for Histopathology 8.2. Type of Histopathology 8.3. Specimen collection and handling in Histopathology <ul style="list-style-type: none"> <li>▪ Necropsy and/or autopsy</li> <li>▪ Biopsy</li> </ul> 8.4. Aspiration 8.5. Tissue marking and tissue marking substances 8.6. Grossing Examination 8.7. Preserving	3 hrs
	Laboratory <ul style="list-style-type: none"> <li>▪ Supervision for Surgical and cytological specimen collection</li> <li>▪ Tissue marking</li> </ul>	3 hrs
Week6	9. Fixation and fixatives <ul style="list-style-type: none"> <li>▪ purpose of fixation</li> <li>▪ classification of</li> </ul>	3 hrs



	<p>fixative additives to fixatives</p> <ul style="list-style-type: none"> <li>▪ Factors involved in fixation</li> <li>▪ Fixative to specific substances</li> <li>▪ Decalcification</li> </ul>	
	<p>Laboratory:</p> <ul style="list-style-type: none"> <li>▪ Surgical and autopsy tissue specimen's fixation</li> <li>▪ Decalcification</li> </ul>	3 hrs
Week 7	Mid-term exam (Test 1)	
Week 8	<p>10. Tissue Processing</p> <ul style="list-style-type: none"> <li>▪ Dehydration</li> <li>▪ Clearing</li> <li>▪ Impregnation</li> <li>▪ Embedding</li> </ul>	3 hrs
	<p>Laboratory:</p> <ul style="list-style-type: none"> <li>▪ Tissue processing</li> </ul>	3 hrs
Week 9	<p>11. Tissue sectioning</p> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Microtomy</li> <li>▪ Type of microtome</li> <li>▪ Paraffin embedded block of tissue section</li> <li>▪ Frozen section</li> </ul>	3 hrs
	<p>Laboratory:</p> <ul style="list-style-type: none"> <li>▪ Microtome Sectioning of paraffin embedded blocks of tissue</li> <li>▪ Lab report</li> </ul>	3 hrs
Week 10	<p>12. Staining</p> <p>12.1. Introduction</p> <p>12.2. Type of stain in histopathology</p> <p>12.3. Principle of stain</p> <p>12.4. Factors determining sensitivity of stains</p>	3 hrs

	<p>Laboratory:</p> <ul style="list-style-type: none"> <li>▪ Urgent sample tissue processing and sectioning</li> <li>▪ Lab report</li> </ul>	3 hrs
Week11	<p>12.5. Commonly used stains in Histological techniques</p> <p>12.6. Hematoxylin and Eosin Stains</p> <p>12.7. Hematoxylin and Eosin (H&amp;E) staining</p> <p>12.8. Quick hematoxylin and eosin stain for urgent biopsies</p>	3 hrs
	<p>Laboratory:</p> <ul style="list-style-type: none"> <li>• Staining of smears and sections with routine procedures</li> </ul>	3 hrs
Week 12	<p>12.9. Special staining methods</p> <ul style="list-style-type: none"> <li>▪ Connective tissue staining</li> <li>▪ Protein, nucleic acid and amyloid</li> </ul>	3 hrs
	<p>Laboratory:</p> <ul style="list-style-type: none"> <li>• Smear preparation and staining</li> </ul>	3 hrs
Week13	<p>12.9. Special staining methods (continued...)</p> <ul style="list-style-type: none"> <li>▪ Carbohydrates and lipids</li> <li>▪ Pigments, Minerals and Bone</li> <li>▪ Neuroendocrine and Neuropathology techniques</li> </ul>	3 hrs
	<p>Laboratory:</p> <ul style="list-style-type: none"> <li>▪ Staining</li> </ul>	3 hrs
Week14	<p>12.9. Special staining methods (continued...)</p> <ul style="list-style-type: none"> <li>▪ Microorganisms</li> <li>▪ Immunocyto chemistry</li> <li>▪ Histochemistry</li> </ul>	3 hrs
	<p>Laboratory:</p> <ul style="list-style-type: none"> <li>▪ Staining</li> <li>▪ Laboratory report</li> </ul>	3hrs 3 hrs
	Self-study [1hrs.]	
Week 15	Mid-term Exam (Test 2)	3 hrs
Week 16	13. Cytochemistry and Histochemistry Techniques	3 hrs

	<ul style="list-style-type: none"> <li>▪ Enzyme histochemistry</li> <li>▪ Immuno staining</li> <li>▪ Immuno-fluorescence</li> <li>▪ Autoradiography</li> </ul>	
	Laboratory: <ul style="list-style-type: none"> <li>▪ Staining</li> <li>▪ Microscopic examination of section smear</li> </ul>	3 hrs
Week 17	14. Mounting and mounting medium (mount ants)	3 hrs
	Laboratory: <ul style="list-style-type: none"> <li>▪ Staining and mounting techniques</li> </ul>	3 hrs
Week 18	15. Interactive lecture on museum techniques 16. Interactive lecture on Quality assurance and safety in histopathology	3 hrs
	Laboratory: Histopathology Museum visit	3 hrs
Week 19	Written and practical examination	3 hrs
Week 20	Written and practical examination	

## **21.16. Medical Bacteriology and Public Health Microbiology Module syllabus**

**Module title: Medical Bacteriology and Public health Microbiology**

**Module Code:MeLS-M3293**

**ModuleEtCTS:17**

**Program: BSc Medical Laboratory Sciences**

**Year: III**

**Module duration:** 20 weeks

Pre-requisite: Basics to Medical Laboratory Science

**Module Description:** This module planned to offer the theoretical and practical knowledge on historical background of bacteriology; morphological classification of bacteria; bacterial structure; bacterial metabolisms and growth; bacterial genetics; sterilization and disinfection; chemotherapy and mechanism of action of antibiotics; staining and bacteriological culture techniques; methods of collection, transportation and processing of clinical samples and examination of medically important pathogenic bacteria (Gram positive cocci; gram positive rods, Gram negative cocci; Gram negative coccobacilli; Enterobacteriaceae, other gram negative rods; Spirochetes; Chlamydia; Mycobacterium; Rickettsia; Mycoplasma and other miscellaneous bacteria). It illustrates strategies in laboratory diagnosis of infective syndromes (the investigation of gastrointestinal infections, Urinary tract infections, wound infections, respiratory infections, sexually transmitted diseases, meningitis and miscellaneous infections) and Quality Assurance in Bacteriology laboratory. This course also will cover the history of public health microbiology, food microbiology and its development, major groups of food products; their safety and quality; methods of sampling of food; sources of spoilage of foods; factors that contribute to grow or inhibit growth of microorganism in food, methods of identification of microorganisms and their products in food; types of water, their safety, quality; sources of pollution of water; bacteriological investigation of water; types of beverages, their safety and quality; source of pollution of beverages; and bacteriological investigation of beverages. Quality Assurance in Public Health Microbiology to ensure laboratory staff, clinicians and patients that laboratory test results are reliable, reproducible and relevant.

### **Module competences**

- Perform bacteriological tests on clinical specimens as per standard operating procedure.

- Practice specimen collection, processing, and analysis during disease outbreak and surveillance according to standard operating procedure.
- Collect process and analyze food, water, beverages and other environmental samples for communicable disease prevention and control as per the standard operating procedures.
- Interpret report and document laboratory test results correctly

#### Learning Outcomes:

To meet the above module objective, the student will be expected to:

- Explain basic concepts of bacteria.
  - Describe types of clinical specimens used for bacteriological analysis.
  - Involve in collection, transportation, & storage of clinical specimen collected for bacteriological analysis
  - Classify bacteria based on different characteristics.
  - List medically important gram-positive cocci
  - Discuss the common pathogenic gram-positive cocci (pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling methods).
  - Perform gram staining techniques.
  - Identify bacteria based on gram staining reaction.
  - Select culture media for culturing gram positive cocci.
  - Involve in culture media preparation.
  - Check sterility of culture media+
  - Perform cultivation of gram-positive cocci
  - Perform quality control of culture media using control strain
  - Identify gram positive cocci based on morphology, growth characteristics, biochemical test
- &others
- Perform antibacterial susceptibility testing for gram positive cocci
  - List medically important gram-negative cocci
  - Discuss the common pathogenic gram-negative cocci (pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling methods)
  - Identify bacteria based on gram staining reaction
  - Select culture media for culturing gram negative cocci

- Perform cultivation of gram-negative cocci
  - Identify gram negative cocci based on morphology, growth characteristics, biochemical test & others
  - Perform antibacterial susceptibility testing for gram negative cocci
  - List medically important gram-positive rods
  - Discuss the common pathogenic gram-positive rods (pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling methods)
  - Select culture media for culturing gram positive bacilli
  - Identify gram positive bacilli based on morphology, growth characteristics, biochemical test & others
  - Perform antibacterial susceptibility testing for gram positive bacilli
  - List medically important gram-negative rods
  - Discuss the common pathogenic gram-negative rods (pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling methods)
  - Select culture media for culturing gram negative bacilli
  - Identify gram negative bacilli based on morphology, growth characteristics, biochemical test & others
  - Perform antibacterial susceptibility testing for gram negative bacilli
  - List medically important spirochetes
  - Discuss the common pathogenic spirochetes (pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling methods)
  - Perform Geimsa staining techniques
  - Perform RPR, VDRL, and TP ABS etc.
  - Perform other serologic and molecular diagnostic techniques for Treponema species and Borriella species
  - Discuss the common pathogenic mycobacterium species (pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling methods)
  - Perform zeehl nelson staining techniques

- Perform TB culture using Lowenstein Janson media and other culturing methods
- Perform molecular diagnostic techniques for MTB
- Perform bacteriological index and morphological index.

Discuss the other pathogenic bacteria (pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling methods)

- List possible bacterial causes of disease outbreak
- Perform bacteriological analysis on sample collected from disease outbreak site
- Discuss food microbiology and food borne diseases
- Describe the type and incidence of the microorganisms in food, beverage and water.
- Perform bacteriological analysis of food and beverages
- Perform bacteriological water analysis
- Interpret results correctly
- Recording and reporting results correctly

#### **Teaching and learning methods**

- Interactive lecture
- Video show
- Laboratory Demonstration (Skill lab)
- Case study
- Laboratory practice
- Laboratory visit

#### **Teaching and learning materials**

Learning guides and checklists

Textbooks

Reference manual

Writing board

Posters/Pictures

videos

White board marker

Laptop

LDC projector

#### **Learning Assessment methods (both formative and summative)**

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Test 3: 5-10%
- Practical Examination: 5-10%
- Assignment, projects, field reports with presentations: 5-10%
- Lab reports: 5%
  - Oral examination: 5%

### **Reference Books**

1. Atlas.R.M. Microorganisms in our world. Mosby St. Louis.1995.
2. Levinson W., Jawetz E., Medical Microbiology and Immunology. 6th ed. McGraw- Hill international edition.2000.
3. Brooks G.F., Butel J.S., Morse S.A Jawetz Medical Microbiology 21st ed. (1998).
4. Cedric Mims, et al. Medical Microbiology (1993).
5. Murray, Medicalmicrobiology
6. Robert Boyd. Basic Medical Microbiology. 5th ed. (1995)
7. Monica Cheesbrough. District Laboratory Practice in Tropical Countries. Volume-2 (2000)
8. Greenwood, Medical microbiology a guide to microbial infections: Pathogenesis, Immunity, Laboratory diagnosis andcontrol
9. B. Patrick Murray, Ken S. Rosenthal, Michael A. Pfaller. (2005) Medical Microbiology 5thed.
10. Baron S (2000) Medical Microbiology 4thedition.
11. Abilo T., Meseret A. Medical Bacteriology Lecture note for Medical Laboratory Technology Students (2006).
12. Jawetz, Melnick, & Adelberg's Medical Microbiology, 24thEdition
13. WHO, Basic laboratory procedures in clinical bacteriology2003?
14. Mackie Mackartney, Practical Medical microbiology 5thed.
15. Green wood, medical microbiolog, 20Thed
16. Champ 's medical microbiology



17. Sheris' Medical microbiology.

**Module Schedule**

week	Learning Activity	hours
<b>Week 1</b>	1. Introduction 1.1. Introduction to Bacteriology 1.2. Historical perspectives 1.3. Essence of bacteriology and definition of terms 1.4. Classification of Bacteria <ul style="list-style-type: none"> <li>• Phenotypic characteristics</li> <li>• Genotypic characteristics</li> <li>• Nomenclature</li> </ul> 1.5. Bacterial structure <ul style="list-style-type: none"> <li>- Bacteria structure</li> <li>- Biosynthesis of bacterial components</li> </ul>	<b>6 hrs</b>
	<b>Laboratory</b>	<b>12 hrs</b>
<b>Week 2</b>	2.1. Bacterial genetics <ul style="list-style-type: none"> <li>2.1.1. Microbial genomic organization</li> <li>2.1.2. Replication</li> <li>2.1.3. Mutation &amp; selection</li> <li>2.1.4. Regulation &amp; gene expression</li> <li>2.1.5. Exchange of genetic information</li> <li>2.1.6. Molecular techniques</li> </ul> 2.2. Bacterial process and growth requirements <ul style="list-style-type: none"> <li>2.2.1. Nutritional requirement for growth</li> <li>2.2.2. Metabolism of bacteria</li> <li>2.2.3. Other metabolic pathways</li> <li>2.2.4. Environmental growth requirement</li> <li>2.2.5. Bacterial growth curve</li> </ul> 2.3. Introduction to antimicrobial agents <ul style="list-style-type: none"> <li>2.3.1. Types of antimicrobial agents</li> <li>2.3.2. Mode of actions of antimicrobial agents</li> </ul>	<b>6 hrs</b>

	2.3.3. Mechanism of antibiotic resistance 2.3.4. Prevention and Control of antibiotic resistance	
	<b>Laboratory</b>	<b>12 hrs</b>
<b>Week 3</b>	3. Host-parasite interaction 3.1. Types of host-parasite interaction 3.2. Determinants of host-parasite interaction 3.3. Immune response to bacterial infection 3.4. Normal flora 3.4.1. Definition of normal flora 3.4.2. Normal flora in different anatomic sites 3.4.3. Benefit and harms of normal flora 3.5. Control spread of bacterial infection 3.5.1. Sterilization, disinfection, antiseptics 3.5.2. Mechanism of action 3.5.3. Preparation of disinfectants & antiseptics, Application	<b>6.5 hrs</b>
	Laboratory demonstration and practice on: Sterilization and Disinfection	<b>12 hrs</b>
<b>Week4</b>	4. . Laboratory Methods used in Bacteriology 4.1. Sample collection, preparation and storage for bacteriological analysis 4.2. Staining 4.2.1. Purpose of staining 4.2.2. Types of staining, their principles and definitions 4.2.3. Gram staining 4.2.4. AFB staining 4.2.5. Special staining 4.2.6. Other staining 4.2.7. Preparation of reagents for staining 4.2.8. Quality control of staining 4.3. Culture media 4.3.1. Purpose of culture media	<b>6.5.hrs</b>

	<p>4.3.2. Types of culture media</p> <p>4.3.3. Preparation of culture media</p> <p>4.3.4. Inoculation, incubation, observation</p> <p>4.3.5. Quality control</p> <p>4.4. Biochemical tests</p> <p>4.4.1. Types of biochemical tests</p> <p>4.4.2. Principles of biochemical tests</p> <p>4.4.3. Purpose of biochemical tests</p> <p>4.4.4. Preparation of media for biochemical tests</p> <p>4.4.5. Quality control</p> <p>4.5. Antimicrobial susceptibility testing</p> <p>4.5.1. Purpose</p> <p>4.5.2. Types</p>	
	<p>Laboratory demonstration and practice on:</p> <p>- Staining, culture media preparation, inoculation, incubation, observation, antimicrobial susceptibility testing</p>	<b>12 hrs</b>
	<b>Test - 1</b>	
<b>Week 5</b>	<p>5. Gram positive cocci</p> <p>5.1. Genus Staphylococci</p> <p>5.1.1. S.aureus</p> <p>5.1.2. Epidermidisa</p> <p>5.1.3. S. saprophyticus</p> <p>5.1.4. Other Staphylococcus</p> <p>5.2. Genus Streptococci</p> <p>5.2.1. S. pyogenes</p> <p>5.2.2. Agalactia</p> <p>5.2.3. S. pneumoniae</p> <p>5.2.4. Other Streptococcus</p> <p>5.3. Genus Micrococci</p> <p>5.4. Genus Enterococci</p> <p>5.4.1. E.faecalis</p>	<b>6 hrs</b>

	<p>5.4.2. E.faecium</p> <p>5.4.3. Others</p> <p>5.5. Other gram-positive cocci</p> <p>NB. For each bacterium the following should be covered: General aspect, physiology and structure, Pathogenesis and immunity, Epidemiology, disease, Laboratory diagnosis, treatment and prevention</p>	
	<p>Laboratory demonstration and practice:</p> <p>- Identification of Medical important members of Staphylococcus, Streptococcus, Enterococcus and other related bacteria</p>	<b>12hrs</b>
<b>Week 6</b>	<p>6.1. Gram negative cocci</p> <p>6.1.1. Genus Neisseria</p> <p>6.1.1.1 N. gonorrhoea</p> <p>6.1.1.2 N. meningitidis</p> <p>6.1.1.3 other</p> <p>6.1.2. Genus Moraxella</p> <p>6.1.2.1. M. catarrhalis</p> <p>6.1.2.2. Others</p> <p>6.1.3. Other Gram-negative cocci</p> <p>6.2. Gram positive rods</p> <p>6.2.1. Genus Bacillus</p> <p>6.2.1.1. B. anthracis</p> <p>6.2.1.2. B. cereus</p> <p>6.2.2. Clostridium</p> <p>6.2.2.1. C. perfringens</p> <p>6.2.2.2. C. tetani</p> <p>6.2.2.3. C. botulinum</p> <p>6.2.2.4. C. difficile</p> <p>6.2.2.5. Others</p> <p>6.2.3. Genus Coryne bacteria</p>	<b>12 hrs</b>

	<p>6.2.4. Genus <i>Listeria</i></p> <p>6.2.5. Genus <i>Erysipelothrix</i></p> <p>6.2.6. Other gram-positive rods</p> <p>NB. For each bacterium the following should be covered: General aspect, physiology and structure, Pathogenesis and immunity, Epidemiology, disease, Laboratory diagnosis, treatment and prevention.</p>	
	<p>Laboratory demonstration and practice on:</p> <p>- Identification of medical important gram-negative cocci and gram-positive rods</p>	<b>12 hrs</b>
<b>Week 7</b>	<p>7. Gram negative coccobacilli</p> <p>7.1. Genus <i>Hemophilus</i></p> <p>7.2. Genus <i>Brucella</i></p> <p>7.3. Genus <i>Bordetella</i></p> <p>7.4. Other gram-negative coccobacilli</p> <p>NB. For each bacterium the following should be covered: General aspect, physiology and structure, Pathogenesis and immunity, Epidemiology, disease, Laboratory diagnosis, treatment and prevention</p>	<b>6 hrs</b>
	<p>Laboratory practice</p> <p>-Laboratory demonstration and practice on identification of medically important gram-positive coccobacilli</p>	<b>12 hrs</b>
<b>Week 8</b>	<p>8. Gram negative rods</p> <p>8.1. Family Enterobacteriaceae</p> <p>8.1.1. General Characteristics of Enterobacteriaceae</p> <p>8.1.2. <i>Escherichia coli</i></p> <p>8.1.3. <i>Klebsiella</i></p> <p>8.1.4. <i>Citrobacter</i></p> <p>8.1.5. <i>Enterobacter</i></p>	<b>6.5.hrs</b>

	8.1.6. Proteus 8.1.7. Serratia 8.1.8. Yersinia 8.1.9. Salmonella 8.1.10. Shigella 8.1.11. Others NB. For each bacterium the following should be covered: General aspect, physiology and structure, Pathogenesis and immunity, Epidemiology, disease, Laboratory diagnosis, treatment and prevention.	
	Laboratory demonstration and practice on: - Identification of Medical important Enterobacteriaceae	<b>12 hrs</b>
<b>Week 9</b>	9. Another gram-negative rod 9.1. Pseudomonas 9.2. Vibrio 9.3. Campylobacter 9.4. Helicobacter 9.5. Spirochetes 9.6. Treponema 9.7. Borrelia 9.8. Leptospira NB. For each bacterium the following should be covered: General aspect, physiology and structure, Pathogenesis and immunity, Epidemiology, disease, Laboratory. diagnosis, treatment and prevention	<b>6 hrs</b>
	Laboratory demonstration and practice on: - Identification of medically important Pseudomonas, Vibrio, Spirochetes - Gram staining, Culturing of gram-negative bacilli	<b>12 hrs</b>
<b>Week 10</b>	10.1. Mycobacterium 10.1.1. M. tuberculosis complex,	<b>6 hrs</b>

	<p>10.1.2. M.leprae</p> <p>10.1.3. Other Mycobacterium</p> <p>10.2. Nocardia and related bacteria</p> <p>10.2.1. Nocardia</p> <p>10.2.2. Rhodo coccus</p> <p>10.2.3. others</p> <p>NB. For each bacterium the following should be covered: General aspect, physiology and structure, Pathogenesis and immunity, Epidemiology, disease, Laboratory diagnosis, treatment and prevention</p>	
	<p>Laboratory demonstration and practice on</p> <p>- Identification of medically important Mycobacterium and Nocardia</p>	<b>12 hrs</b>
	Test-2	
<b>Week 11</b>	<p>11.1. Miscellaneous bacteria</p> <p>11.1.1. Genus Chlamydia</p> <p>11.1.2. Genus Rickettsia</p> <p>11.1.3. Genus Mycoplasma</p> <p>11.1.4. Genus Legionella</p> <p>11.1.5. Anaerobic bacteria</p> <p>11.2. Systemic bacterial infection</p> <p>11.3. Quality Assurance in Bacteriology</p> <p>11.3.1. Pre-analytical quality assurance</p> <p>11.3.2. Analytical quality assurance</p> <p>11.3.3. Post-analytical quality assurance</p> <p>NB. For each bacterium the following should be covered: General aspect, physiology and structure, Pathogenesis and immunity, Epidemiology, disease, Laboratory diagnosis, treatment and prevention</p>	<b>6 hrs</b>
	Laboratory demonstration and practice on: - Identification of Miscellaneous	<b>12 hrs</b>

	bacteria exercising quality assurance in the lab	
<b>Week 12</b>	12.1. Introduction to Public health Microbiology 12.1.1. Significance of microorganisms in foods, water and beverages 12.1.2. Sources & types of microorganisms 12.2. Factors that affect & favor microbial growth in food 12.2.1. Intrinsic factors 12.2.2. Extrinsic factors	<b>6 hrs</b>
	Laboratory practice - Collection and Demonstration of materials for food and water analysis	<b>12 hrs</b>
	Test-3	
<b>Week 13</b>	13. Incidence of microorganisms in food 13.1. Microbial spoilage of foods 13.2. Spoilage of fruits 13.3. Spoilage of vegetables 13.4. Spoilage of fresh & processed Meats	<b>6 hrs</b>
	Laboratory practice - Collection and processing of food sample for microbiological analysis - Media preparation and inoculation of food samples	<b>12 hrs</b>
<b>Week 14</b>	14. Laboratory method for detecting Microorganisms and their products in foods 14.1. Microbiological 14.2. Non microbiological 14.3. Bioassay methods 14.4. Microbial indicators of food safety & quality	<b>6 hrs</b>
	Laboratory practice - Enumeration and Identification of organisms from food samples	<b>12 hrs</b>
<b>Week 16</b>	Food borne diseases 16. Food preservation & storage 16.1. Physical methods 16.2. Chemical methods 16.3. Emerging methods	<b>6 hrs</b>



	. 16.4. Fermented food & products of fermentation	
	Laboratory practice - Enumeration and identification of isolates from food	<b>12 hrs</b>
<b>Week 17</b>	17. Bacteriological analysis of water, beverage & milk 17.1. Types, Safety, Quality, Sources & types of microorganisms 17.2. Sampling methods 17.3. Methods of analysis	<b>6 hrs</b>
	Laboratory practice - Water sample collection and inoculation	<b>12 hrs</b>
<b>Week 18</b>	18. Bioterrorism	<b>4 hrs</b>
	Laboratory practice	<b>10 hrs</b>
<b>Week 19</b>	19. Quality assurance in public Health	<b>2 hrs</b>
<b>Week 19-20</b>	Written and practical examination	

### 21.17. Medical Virology Module syllabus

**Module name: Medical Virology**

**Module Code: MeLS-M3303**

**Module EtCTS: 5**

**Program: BSc in Medical Laboratory Sciences**

**Year: III**

**Module Duration: 20 Weeks**

Pre-requisite: Basics to Medical Laboratory Science

Module Description: This module will include: Properties, classification, and, replication of viruses (viral genetics); pathogenesis; laboratory propagation of medically important viruses ;

preservation methods; laboratory diagnosis of medically important viral infections, specimen

collection; cell culture; antibody detection; rapid detection methods; There will be detailed study

of selected viral diseases (e.g. HIV /AIDS; rubella, influenza; HSV); Emerging and re-emerging

viral diseases; Emphasis will be given to diagnostic techniques: isolation, animal inoculation,

bio-typing; direct microscopy; serological techniques including agglutination, CFT; IF methods.

(Quality Assurance in Medical Virology)

Module Competencies

- Perform virological tests on clinical specimens as per standard operating procedure.

Practice

- specimen collection, processing, and analysis during disease outbreak and surveillance according to standard operating procedure
- Interpret, report and document laboratory test results correctly

Learning Outcomes

To meet the above module objective, the student will be expected to:

- Explain general characteristics of viruses
- Discuss classification of viruses and virus infectious cycle
- Identify diagnostic methods in virology
- Perform collection, processing of clinical specimen in virology
- List medically important DNA viruses

Discuss common pathogenic DNA viruses (pathogenicity, clinical

manifestations, laboratory diagnosis, prevention & controlling methods)

- Perform common methods in the diagnosis of HBV, HSV and other viruses
- Perform microscopic examination of CPE
- Identify medically important RNA viruses
- Discuss the common pathogenic RNA virus species (pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling methods)
- Perform common methods in the diagnosis of influenza virus, Rota virus, Rubella virus and other RNA virus
- Perform common viral diagnosing methods (PCR, Serology & culture

- Identify medically important Hepatitis viruses
- Discuss Hepatitis virus species (pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling methods)
- Perform common methods in the diagnosis of HBV, HCV other hepatitis virus
- Identify medically important Retrovirus viruses
- Discuss pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling method
- Retrovirus viruses
- Perform common methods in the diagnosis of HIV virus
- Perform viral load and CD4+ count
- List medically important DNA viruses
- Discuss the common pathogenic Emerging and reemerging viral diseases
- Apply common viral diagnosing methods PCR, Serology & culture.
- Identify possible viral causes of disease outbreak
- Perform bacteriological analysis on sample collected from disease outbreak site
- Apply team working in the management of epidemic viral infections
- Interpret, Record and report results correctly.

### **Teaching and learning methods**

- Interactive lecture
- Video show
- Laboratory Demonstration (Skill lab)
- Case study
- Laboratory practice
- Laboratory visit

### **Teaching and learning materials**

- Learning guides and checklists
- Textbooks
- Reference manual
- Writing board
- Posters/Pictures
- LCD Projector

- Videos
- White board marker
- Laptop

Learning Assessment methods (both formative and summative)

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Test 3: 5-10%
- Practical Examination: 5-10%
- Assignment, projects, field reports with presentations: 5-10%
- Lab reports: 5%
- Oral examination: 5%

**Reference Books and Resources**

1. Patrick R. Murray, Ken S. Rosenthal, George S. Kobayashi, Michael A. PfAller. Medical microbiology fourth Edition. Mosby, Inc.2002.
2. Jawetz, Mel nick, Adel berg's Geo.F. Brooks, Janet S. Butel, Stephen A.Morse. Medical Microbiology twenty-first edition. Appleton and Lange Stamford, Connecticut1995.
3. Cheebrough M. Medical Laboratory manuals for tropical countries volume II. Tropical health technology /Butter worth – Heinemann1991.
4. Boyd R. Basic Medical Microbiology Fifth edition. Lippincott company1995.
5. Mackie and McCartney. Practical medical microbiology 13th edition. Churchill Livingston1989.
6. Bernand D. Davis, Renato Dulbecco, Herman N. Eisen and Harold S. Ginsberg. Microbiology fourth edition. Lipinocott Company1990.
6. **Bob A. Freeman. Burrows Text book of microbiology twenty-second edition. W.B. Saunders Company1985.**
8. Gillies.R.R. Lecture notes on medical microbiology second edition. Black Well Scientificpublications1978.
9. G.A. C. Thomas. Medical Microbiology third edition. The Williams andWilkins Company, Baltimore 1973.
10. Joklik, Willett, Amos, and Wilfert. Zinsser Microbiology 20th edition. Appletonand

Lange1992.

11. Robert Bailey.W. Diagnostic microbiology 4th edition. The C.V. Mosby company1974.

12. David Greenwood, Richard Slack, John Peutherer, Mike Barer. Medical Microbiology: a guide to microbial infections, Pathogenesis, Immunity, Laboratory diagnosis and control. Churchill Livingstone, 2007. Online access

#### Module Schedule

week	Essential contents and Learning methods and Activities	hours
Week 1	1. Basic Concepts of medical virology 1.1. Introduction to virus 1.2. Structure and properties of medically important virus 1.3. Classification of medically important virus	4 hrs
	Laboratory demonstration on - Virology lab arrangement (protective equipment, setup, workflow)	3 hrs
Week 2	1.4. Virus infectious cycle (replication of RNA and DNA virus)	3 hrs
Week 3	1.5. Virus host interaction and viral pathogenesis 1.6. Antiviral agents and vaccine 1.7. Specimen collection, transportation and preservation	4 hrs
Week 4	2 Diagnostic methods in virology 2.1. Procedures in characterization of virus form clinical specimen 2.2. Microscopic	3 hrs
	Laboratory demonstration on - Sample processing and storage demonstration - Sterilization, disinfection and safety	3 hrs
Week 5	2.3. Cytopathic Effect (CPE) 2.4. Cell culture 2.5. Serological methods 2.6. Molecular techniques	4 hrs

	2.7. Disinfection and Biosafety in virology laboratory	
	Laboratory demonstration and practice on: Serological tests	3 hrs
	Test-1	
Week 6	3. Medically important DNA virus 3.1. Adenovirus 3.2. Poxvirus NB: for every virus the following should be included; structure, replication, pathogenesis, epidemiology, disease, diagnosis, treatment and prevention.	2 hrs
	Laboratory practice: Serological tests	3 hrs
Week 7	3.3. Herpesvirus (HSV, CMV, EBV, VZV etc) 3.4. Parvo virus NB: for every virus the following should be included; structure, replication, pathogenesis, epidemiology, disease, diagnosis, treatment and prevention.	3 hrs
	Laboratory demonstration and practice	3 hrs
Week 8	3.5. Papova virus 3.6. Hepatitis B virus NB: for every virus the following should be included; structure, replication, pathogenesis, epidemiology, disease, diagnosis, treatment and prevention.	4 hrs
	Laboratory demonstration and practice on: HBV	3 hrs
Week 9	4. Medically important RNA virus 4.1. Orthomyxoviruses 4.2. Paramyxoviruses NB: for every virus the following should be included; structure,	3 hrs

	replication, pathogenesis, epidemiology, disease, diagnosis, treatment and prevention.	
	Laboratory practice	3 hrs
Week 10	4.6. Coxsackievirus 4.7. Other Enterovirus NB: for every virus the following should be included; structure, replication, pathogenesis, epidemiology, disease, diagnosis, treatment and prevention	2 hrs
	Laboratory demonstration and practice	
Week 11	5. Hepatitis virus 5.1. HAV 5.2. HCV 5.3. HDV 5.4. HEV 5.5. HGV NB: for every virus the following should be included; structure, replication, pathogenesis, epidemiology, disease, diagnosis, treatment and prevention.	3 hrs
	Lab: laboratory diagnosis of HCV	3 hrs
	Test-2	
Week 13	6. Reo virus (Reo virus and Rota virus) 7. Rhabdo viruses 8. Toga virus 9. Flavivirus	3 hrs
	Laboratory demonstration and practice on diagnosis of viruses	3 hrs
Week 14	10. Bunyavirus 11. Arina virus	

	12. Retrovirus (HIV)	
	Laboratory demonstration and practice on - Serologic diagnosis of retroviruses (HIV)	3 hrs
Week 15	13. Emerging and reemerging viral diseases 13.1. SARS (corona virus) 13.2. Arbovirus 13.3. Neph and Hendra 13.4. Ebola 13.5. Avian flu virus	3 hrs
	Laboratory	3 hrs
Week 16	14. Infectious disease 14.1. Possible viral causes of disease outbreak	3 hrs
	Laboratory	3 hrs
	Test -3	
Week 17	15. Unconventional slow viruses and prion disease	2 hrs
Week 18	16. Quality assurance on Virological test	2 hrs
Week 19- 20	Written and practical examination	



## **21.18. Medical Mycology Module syllabus**

**Module name: Medical Mycology**

**Module Code: MeLS-M3313**

**Module EtCTS: 3**

**Program: BSc Medical Laboratory Sciences**

**Year: III**

**Module Duration: 20 Weeks**

**Pre-requisite: Basics to Medical Laboratory Science**

**Module Description:** The module will encompass introduction to medical mycology; Classification of fungi; morphological features of fungi (mycelium, spores, yeasts, etc); pathogenesis and virulence of fungi; microscopic, cultural, biochemical and serological tests

used in the isolation of fungal pathogens in clinical specimens, antifungal agents; superficial

mycoses; cutaneous mycoses; subcutaneous; systemic mycoses; opportunistic fungal infections;

and quality Assurance in Medical Mycology.

### **Module Competencies**

Perform laboratory diagnosis of fungal infection on clinical specimens as per standard operating procedure.

Interpret report and document laboratory test results correctly.

### **Learning Outcomes**

- To meet the above module objective, the student will be expected to:
- Describe the general characteristics, morphology, reproduction and classification of fungi
- Explain laboratory diagnosis methods of mycoses
- Perform collection, processing, transportation & storage of fungal specimen
- Perform fungal culture
- Identify medically important fungi using staining, growth, biochemical & other methods
- Discuss medically important superficial and cutaneous mycoses
- Discuss the etiological agents, epidemiology, and mode of transmission, pathogenesis

clinical picture and laboratory diagnosis of superficial and cutaneous mycoses.

- Perform diagnosis of superficial and cutaneous mycoses
- Perform fungal culture
- Discuss medically important subcutaneous mycoses
- Discuss the etiological agents, epidemiology, and mode of transmission, pathogenesis

clinical picture and laboratory diagnosis of subcutaneous mycoses.

- Perform diagnosis of subcutaneous mycoses
- Perform fungal culture
- Discuss medically important systemic mycoses
- Discuss the etiological agents, epidemiology, and mode of transmission, pathogenesis

clinical picture and laboratory diagnosis of systemic mycoses.

- Perform diagnosis of systemic mycoses
- Perform fungal culture
- Discuss medically important opportunistic mycoses
- Discuss the etiological agents, epidemiology, and mode of transmission, pathogenesis

clinical picture and laboratory diagnosis of systemic mycoses.

- Perform diagnosis of candidiasis and Cryptococcal meningitis
- Describe types and mechanisms of actions of anti-fungal agents
- Perform anti-fungal susceptibility testing
- Interpret, record and report result correctly

### **Teaching and learning methods**

- Interactive lecture
- Video show
- Laboratory Demonstration (Skill lab)
- Case study
- Laboratory practice
- Laboratory visit

### **Teaching and learning materials**

- Learning guides and checklists
- Textbooks
- Reference manual

- Writing board
- Posters/Pictures
- LCD Projector
- videos
- White board marker
- Laptop

**Learning Assessment methods (both formative and summative)**

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Test 3: 5-10%
- Practical Examination: 5-10%
- Assignment, projects, field reports with presentations: 5-10%
- Lab reports: 5%
- Oral examination: 5%

**Reference Books and Resources**

1. Evans and et al.1985.Essentionls of medical Mycology
2. Lennet et al. 1985.Manual of Clinical Microbiology
3. Dismukes, Pappus and Sobel. 2003. Clinical Mycology.
4. Jawetz, Melnick, & Adelberg's Medical Microbiology, 24th ed.
5. Nigussie D. Mycology lecture note.

**Module schedule**

week	Essential contents and Learning methods and Activities	Hours
Week 1	1. Basic Concepts of medical mycology 1.1. Introduction to Medical mycology 1.2. General characteristics of fungi 1.3. Morphology of fungi (Mold, Yeast and dimorphism) 1.4. Fungal reproduction	3 hrs
Week 2	1.5. Classification of fungi 1.6. Ecology of fungi	3 hrs

	1.7. Overview of fungal diseases 1.8. Predisposing factors 1.9. Fungal immunity	
Week3	2. Laboratory Diagnosis of Fungal Infection 2.1. Mycological specimen Collection, transportation & processing of mycological specimens	2 hrs
	Laboratory demonstration and practice on - Specimen collection and processing	
Week 4	3. Laboratory Diagnosis of Fungal Infection Examination methods 3.1. Microscopy	3 hrs
	Laboratory demonstration and practice on - Microscopic saline, (KOH wet mount) examination	3 hrs
Week 5	3.2. Culture	2 hrs
	Laboratory demonstration and Practice on - Microscopic fungal infection examinations and fungal culture	3 hrs
Week 6	3.3. Serological methods 3.4. Other methods of fungal diagnosis 3.5. Molecular techniques 3.6. Laboratory safety	2 hrs
	Laboratory demonstration and practice	3 hrs
	Test -1	
Week 7	4. Superficial mycoses 4.1. Tinea versicolor 4.2. Piedra 4.3. Tinea nigra	2 hrs
Week 8	5. Cutaneous mycoses: 5.1. Tinea capitis 5.2. Tinea pedis	3 hrs

Week 9	5.3. Tinea corporis 5.4. Tinea cruris 5.5. Tinea barbae	2 hrs
	Laboratory demonstration and practice on - Microscopic wet mount (KOH) examination and fungal culture	3 hrs
Week 10	5.6. Tinea unguium 5.7. Tinea Favosa 6. Subcutaneous mycoses - Sporotrichosis Maudro mycosis	2 hrs
	Laboratory demonstration and practice on: - Microscopic wet mount (KOH) examination and fungal culture	
	Exam -2	
Week 11	Phaeohypho mycosis	2 hrs
	Laboratory demonstration and practice on - Microscopic wet mount (KOH) examination and fungal culture	4 hrs
Week 12	Chromoblastomycosis	2 hrs
	Laboratory demonstration and practice - Microscopic wet mount (KOH) examination and fungal culture	
Week 13	Rhinosporidiosis	2 hrs
	Laboratory demonstration and practice on: - Microscopic wet mount (KOH) examination and fungal culture	
Week 14	7. Systemic mycoses 7.1. Histoplasmosis 7.2. Blastomycosis	2 hrs
	Laboratory demonstration and Practice on:- Inoculation, incubation, reading and interpretation of fungal culture media	3 hrs

Week 15	7.3. Coccidioido mycosis 7.4. Paracoccidioido mycosis	2 hrs
	Laboratory demonstration and Practice on - Biochemical tests for identification of fungi based on SOPs	
Week 16	8. Opportunistic Mycoses 8.1. Candidiasis 8.2. Cryptococcosis	2 hrs
	Laboratory demonstration and Practice on: - Germ tube test, slide culture technique and Indian ink preparation based on SOPs	3 hrs
Week 17	8.3. Pneumocystis carinii 8.4. Zygomycosis 8.5. Aspergillosis	2 hrs
	Laboratory demonstration and Practice on: - Germ tube test, slide culture technique and Indian ink preparation based on SOPs	3 hrs
Week 18	8.6. Antifungal Agents	2 hrs
Week 19	9. Quality Assurance in Medical Mycology	2 hrs
Week 20	Written and practical examination	

## **21.19. Basic Pharmacology**

**Module Name: Biomedical Sciences**

**Module code:Phar-M3322**

**Module EtCTS: 5**

**Program: BSc in Medical Laboratory Sciences**

**Year: III**

**Module duration: 20 Weeks**

**Pre-requisite: None**

### **Module Description:**

The module is intended to equip students with the basic knowledge of Pharmacology.

### **Module Competency**

- Explain the general concepts and principles of pharmacology
- Identify structure, functions, classes of drugs and their mechanism of actions

### **Learning outcome**

- Understand general concepts and principles of pharmacology
- Understand the different classes of drugs and their mechanism of actions
- Understand the principles of antimicrobial resistance testing

### **Teaching-Learning Methods and activities**

- Interactive lecture and discussion
- Facilitated discussion
- Role play
- Case study
- Video show
- Demonstration (at skills lab)
- Teaching-Learning Materials and resources
- Reference Books and Resources

### **References**

1. Bertram G. Katzung, Basic and clinical Pharmacology 14th edition and latest
2. Charles R. Craig, Robert E. Stitzel, Modern Pharmacology with clinical Application 5th edition and latest
3. Richard A. Harvey Pamela C. Champe Pharmacology 4th edition and latest

**Learning Assessment methods (both formative and summative)**

- Written cognitive knowledge test (MCQ/essay)
- Performance assessment in Simulated environment using OSPE
- Performance assessment in real work setting using
- Direct observation of practice (DOP)
- Review of reflective portfolio
- Review of works (assignments, projects, ....) completed by students
- Case study
- Summative assessment
- Written cognitive knowledge test using MCQ/essay/case study = 80%
- Review of students' reflective portfolio = 20%

**Module Schedule**

<b>Week</b>	<b>Learning Activity</b>	<b>Hour</b>	<b>Required Reading Assignment</b>
Week 1	Interactive lecture on: (4 hrs) Introduction to General Pharmacology (4hrs) Introduction (definitions, subdivision, source of drugs) Drug disposition (pharmacokinetics)	4 hrs	TBA
Week 2	Interactive lecture on: (5 hrs) Pharmacodynamics (2hrs) Factors affecting dose and drug action (3hrs)	5 hrs	
Week 3	Interactive lecture on: (3 hrs) Drug adverse effects and drug toxicities (3hrs)	3 hrs	
Week 4	Interactive lecture on: (5hrs)	5 hrs	



	GIT pharmacology (5hrs)		
Week 5	Interactive lecture on: (4hrs) Pharmacology of Broncho – pulmonary systems (4hrs)	5 hrs	
Week 6	Interactive lecture on: (4 hrs) Pharmacology of Broncho – pulmonary systems (4hrs)	4 hrs	
Week 7	Interactive lecture on: (4 hrs) Cardiovascular Pharmacology (4hrs)	4 hrs	
Week 8	Interactive lecture (4) Cardiovascular Pharmacology cont... (4hrs)	4 hrs	
Week 9	Interactive Lecture on: (4 hrs) Blood Pharmacology (4hrs)	4 hrs	
Week 10	Interactive Lecture on: (4 hrs) Blood Pharmacology.... (4hrs)	4 hrs	
Week 11	Interactive lecture on: (3 hrs) Therapy of Endocrine disorders (3hrs)	3 hrs	
Week 12	Interactive lecture on: (2hrs) Therapy of Endocrine disorders... (2hrs)	2 hrs	
Week 13	Interactive lecture on: (3 hrs) Pharmacology of the central Nervous system (3hrs)	3 hrs	
Week 14	Interactive lecture on: (3 hrs) Pharmacology of the central Nervous system... (3hrs)	4 hrs	

Week 15	Interactive lecture on: (5hrs) Overview of Chemotherapy of microbial infections (5 hrs)	5 hrs	
Week 16	Interactive Lecture on: (4 hrs) Over view of Chemotherapy of protozoal infections (4hrs)	4 hrs	
Week 17	Interactive Lecture on: (4 hrs) Overview of Chemotherapy of fungal infections (4hrs)	3 hrs	
Week 18	Interactive Lecture on: (3 hrs) Overview of Chemotherapy of helminthiasis (core drugs: mebendazole, pierazine citrate, metronidazole, diethylcarbazepine, ivermectin, thiabendazole, praziquantel, levamisole, niclosamide) (3 hrs)	4 hrs	
Week 19	Interactive Lecture on: (2 hrs) Overview of Chemotherapy of helminthiasis (core drugs: mebendazole, pierazine citrate, metronidazole, diethylcarbazepine, ivermectin, thiabendazole, praziquantel, levamisole, niclosamide)... (2 hrs)	2 hrs	
Week 20	Final exam		

## **21.20. Community based Training Program (CBTP)**

**Module syllabus Module name:**

**Community Based Training Program (CBTP)**

**Module Code: ComH-M3332**

**Module EtCTS: 5**

**Program: BSc in Medical Laboratory Sciences**

**Year: III**

**Module duration: 3 weeks**

**Module Description:** This module is intended to enable students acquire skills of health profile development and community diagnosis as a means to identify priority health problems of the community which are amenable to intervention under existing circumstances.

### **Module competencies**

- Advocate proper use of laboratory tests.
- Demonstrate effective verbal and written communication with client and clients' family.
- Work in harmony with the health care workforce and stake holders.
- Provide health Information to communities and clients.
- Design and apply appropriate intervention for psychological, social, and environmental determinants of health

### **Learning outcome**

At the end of the course the student will be able to

- Develop health profile
- Do community diagnosis
- Identify health and health-related problems of the community.
- Prioritize identified problems for intervention.
- Suggest possible and practicable interventions for priority problems
- Teaching-Learning Methods
- Community survey, diagnosis and intervention
- Supervised community practice, Portfolio

### **Teaching-Learning Materials**

1. David Sprigging's, John B. Chambers. Acute medicine: a practical guide to the management of medical emergencies, 4th edition.

2. Ferri. Ferri's Clinical Advisor, 1st edition. 2009
3. Dan L Long (et al.) Harrison's principles of medicine. 18th edition. 2012
4. Goldman. Cecil Medicine. 23rd edition. 2007
5. Bailey and Love's Short Practice of Surgery. 25th ed. [edited by] Norman J Williams, Christopher J.K. Bulstrode, P Ronnan O'Connell. 2008
6. Courtney M. Townsend Jr. [et al.]. Sabiston textbook of surgery: the biological basis of modern surgical practice. 19th ed. 2012
7. Schwartz, Principles of Surgery. 9th edition.2010
8. WHO. District hospital essential surgical skills manual.
9. Eddleston, Michael; Davidson, Robert; Brent, Andrew; Wilkinson, Robert. Oxford Handbook of Tropical Medicine, 3rd Edition. 2008
10. Jira C, Feleke A, Mitike G. Health services management for health science students. Carter Center; 2003.
11. Berhane Y, Haile Mariam D, Kloos H. The epidemiology and ecology of health and disease in Ethiopia. Addis Ababa; Shama Books, 2006.
12. Rothman. Modern epidemiology
13. Daniel: Biostatistics: A foundation for analysis in health sciences.
14. Pagano: Principles of Biostatistics
15. Management Sciences for Health (MSH). Managers who lead. MSH, 2005.
16. Walt G, Vaughan P. An Introduction to the Primary Health Care Approach in Developing Countries: A Review with Selected Annotated References. Ross Institute of Tropical Hygiene: London School of Hygiene and Tropical Medicine.  
1981.[http://books.google.com.et/books/about/An\\_Introduction\\_to\\_the\\_Primary\\_Health\\_Ca.htm](http://books.google.com.et/books/about/An_Introduction_to_the_Primary_Health_Ca.htm)
17. Carl Fertman and Diane Allensworth. Health promotion programs: from theory to practice. 2010
18. Lawrence Green, Marshall Kreuter. Health program planning: an educational and ecological approach. Volumes 1-2. 2005
19. Jackie Green, Keith Tones. Health promotion: planning and strategies. 2010
20. Mark Edberg. Essentials of health behavior: social and behavioral theory in public health. 2007

21. Richard D. Semba and Martin W. Bloem. Nutrition and health in developing countries. Human Press. 2008
22. Geoffrey P Webb. Nutrition. A health promotion approach. 3rd edition.
23. Rosalind S. Gibson. Principles of nutritional assessment. 2nd edition. 2005
24. Robert H Friis. Essentials of environmental health (2nd edition). The essential public health series. 2012.
25. Kathryn Hilgenkamp. Health: Ecological Perspectives. 2006
26. Herman Koren and Michael Bisesi. Handbook of environmental health. 2002

### **Teaching and learning material and resources**

- AV aids (LCD and computer, writing board and marker or chalk)
- Computers with internet and data analysis software
- Logbooks for entry of community experience
- Stationeries for community survey
- Drugs, equipment, tools and materials for clinical and public health interventions

### **Assessment Methods**

#### Formative assessment

- Logbook and portfolio
- Continuous supervision CBTP
- Activity report

#### **Summative assessment**

- Weekly evaluation
- Fort night report
- Final symposium (presentation)
- Final activity report (document)
- Written examination

Week	Activity
Week 1&2	<p>Discussion with local administration, health office, PHCU staff and community representatives about attachment objectives and roles and responsibilities of all parties</p> <p>Health profile: survey, analysis of results, action plan and presentation and discussion</p> <p>Community diagnosis: survey, analysis of results, action plan and presentation and discussion</p>
Week3&4	<p>Plan and implement PHCU and local health office activities in coordination with them</p> <ul style="list-style-type: none"> <li>• Clinical service at laboratory and outreach sites throughout the week including duty</li> <li>• Public health interventions: Health education, school health, prison health, health problems</li> <li>• Home visits</li> <li>• Weekly activity report and seminar on Friday afternoons</li> </ul> <p>Evaluate effectiveness and efficiency of the service rendered and the community learning experience</p> <p>Overall reporting and discussion</p>

### 21.21. Clinical Laboratory Attachment II module syllabus

**Module Name: Clinical Laboratory Attachment II**

**Module code: MeLS-M3343**

**Module EtCTS:5**

**Program: Undergraduate BSc in Medical Laboratory Science**

**Year: III**

**Module duration: 16Weeks**

**Laboratory Hours:** 20 hours /week

**Pre-requisite:** Basic to Medical Laboratory Science and Medical Parasitology and Vector Biology. They have to take Bacteriology, Hematology and Immunohematology, Immunology and Serology, Medical Mycology, Medical Virology and Histopathology Modules in parallel and prior to the attachment.

**Module description:**

The student is assigned to hospital laboratory where he/she collects, transports, prepares and preserves biological specimens; and perform and interpret Microbiological, Parasitological,

Hematological, Immuno hematological, Biochemical, Immunological, serological, Molecular, Virological, Mycological and Histopathological techniques.

### **Module Competency**

- Prepare working reagents and solutions.
- Collect, prepare, preserve and transport biological specimens from patients for diagnostic tests
- Perform and interpret Microbiological, Parasitological, Hematological, Immuno hematological, Biochemical, Immunological, Serological, Molecular, Virological, Mycological and Histopathological techniques.
- Be able to practice/familiarize with the necessary materials/equipment's and reagents associated with Microbiological, Parasitological, Hematological, Immuno hematological, Biochemical, Immunological, Serological, Molecular, Virological, Mycological and Histopathological techniques.
- Apply quality assurance and safety precaution measures
- Communicate and handle patients properly

### **Learning outcome**

Upon completion of the module, students will be able to:

- Prepare working reagents and solutions.
- Collect, prepare, preserve and transport biological specimens from patients for diagnostic tests
- Perform Microbiological, Parasitological, Hematological, Immuno hematological, Biochemical, Immunological, Serological, Molecular, Virological, Mycological and **Histopathological techniques.**
- Interpret Basic Molecular Biology techniques, Microbiological, Parasitological, Hematological, Immuno hematological, Biochemical, Immunological, Serological, Virological, Mycological and Histopathological techniques.
- Apply quality assurance and safety precaution measures
- Communicate and handle patients properly
- Communicate properly with laboratory staff, peers and other health care workers
- Familiarize how to report laboratory test results
- familiarize for the preparation, proper storage and control of different reagents

- Appreciate the significance of the laboratory test result in the investigations of diseases

Methods of delivery: Hospital Laboratory Attachment.

**Assessment:**

- Hospital attachment evaluation: 50% (the attachment objectives and evaluation checklist will be prepared by the respective department)
- Case and seminar presentation: 10% (one group should present a seminar every Friday)
- Practical examination: 40%
- Total: 100%

**21.22. Clinical chemistry and Toxin Analysis module syllabus**

**Module Name: Clinical Chemistry and Toxin Analysis**

**Module Code: MeLS-M4353**

**Module EtCTS: 17**

**Program: BSc Medical Laboratory Sciences**

**Year: IV**

**Module Duration: 20 weeks**

**Pre-requisite:** Basics to Medical Laboratory Sciences

**Module Description:**

This module deals with principles of major clinical chemistry instruments and solutions; collection and preparation of specimen for clinical chemistry analysis. It also presents the physiological basis, principle, procedure, and clinical significance of clinical chemistry test and test results, including quality control and reference values. Moreover, the module covers introduction to the science of toxicology; apparatus, reference compounds; clinical aspects of analytical toxicology; the role of clinical toxicology laboratory; general laboratory findings in toxicology laboratory.

**Module Competency:**

- Collect, transport, prepare and store biological specimens in accordance with SOPs by complying to ethical standards
- Monitor and maintain performance of laboratory equipment and reagents
- Perform different clinical chemistry analytes, drugs levels and toxins in accordance with SOPs following safety standards
- Perform toxin analysis using different methods and instruments following SOPs



- Use automated equipment and instruments capable of performing a number of tests simultaneously.
- Interpret record, document and report laboratory test results based on quality standards

### **Learning outcomes**

#### **After completion of this module, the student is expected to:**

- Define clinical chemistry
- Describe significance of clinical chemistry
- Discuss the principles and fundamental laws in radiant energy
- Discuss the principles, concepts and basic components of analytical instruments
- Discuss the principles, concepts and clinical significance of different analyte measurement
- Determine different clinical chemistry biochemical analytes according SOPs and manufacturers 'instructions
- Demonstrate adherence to policies and procedures in clinical chemistry laboratory
- Explain the basic principle of toxicology.
- Explain the general principles of Specific toxicity
- Demonstrate analysis of various toxins in clinical specimen
- Register and record patient and reagent details and findings on appropriate registration books and laboratory information system using a standard procedure.
- Promote laboratory safety issues during laboratory practices
- Advocate laboratory quality control in laboratory
- Proper use of SOPs, lab equipment and resources
- Demonstrate adherence to policies and procedures in clinical chemistry laboratory

### **Teaching-Learning Methods and activities**

- Interactive lecture
- Facilitated discussion
- Case study
- Video show
- Laboratory Demonstration
- Guided clinical practice

### **Teaching and learning materials**

Learning guides and checklists

Text books

Reference manual

Writing board

Posters/Pictures

LCD Projector

Smart-board screen

White board, marker

Laptop

**Learning Assessment Methods (both formative and summative)**

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Practical Examination: 10%
- Assignment, projects, field reports with presentations: 10%
- Lab reports: 5%
- Oral examination: 5%

**Reference Books**

1. Bishop ML, Fody EP, Schoeff LE. Clinical Chemistry: Principles, Procedures, Correlations. 8th edition.
2. Burtis C, Ashwood E, Bruns D. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 7th edition,
3. Arneson W and Brickell J. Clinical Chemistry: A Laboratory Perspective. 6th edition. Jan 25, 2007
4. Bekele T. Clinical chemistry lecture note for medical laboratory technology
5. Doull, J., Kalassen, C.D., and Amdur, M.D., (eds.) Casarett and Doull's Toxicology, the Basic sciences of poisons, 5th Ed, MCGraw Hill, 1996.
6. Timbrell, J.A. Introduction to Toxicology, Taylor and Francis Ltd. 2nd ed. 1995.
7. Peter Viccellio. Handbook of medical toxicology (1993)
8. Lester M. Haddad et al. Clinical management of poisoning and drug overdose (1998)

## Module Schedule

Week	Contents	Time allocated
Week 1	<p><b>1. Definition &amp; Significance of Clinical Chemistry</b></p> <p><b>2. Solutions</b></p> <p>2.1 Types of solutions and solution concentrations</p> <p>2.2 Dilution problems: simple and serial dilution</p> <p>2.3 Expressing solution concentrations</p> <p>2.4 Concept of pH, buffer solutions &amp; composition</p> <p>2.5 Inter conversion of measurement units</p> <p><b>3. Introduction to Radiant Energy</b></p> <p>3.1 The electromagnetic spectrum</p> <p>3.1.1 Radiation sources, measurement of absorption of ultra violet and Visible light</p> <p>3.1.2 Interaction of RE with matter</p> <p><b>3.2 Application of Fundamental Laws of absorption</b></p> <p>3.2.1 Beer's Law</p> <p>3.2.2 Lambert's Law</p> <p>3.2.3 Combined Beer's-Lambert's Law</p> <p><b>3.3 Analytical Procedures &amp; Instrumentation</b></p> <p>3.3.1 Principles, concepts and fundamentals of: Photometer, Colorimeter, Spectrophotometer, Refractometer, Fluorometer, Turbidimeter, Nephelometer, Electrophoresis</p> <p>3.3.2 How to choose the proper wavelength for selective biochemical substance measurement</p> <p>3.3.3 General guidelines on calibration &amp; use of calibration curves</p>	8 hrs

	<p><b>3.4 Measurement Procedures &amp; Calculation in Clinical Chemistry</b></p> <p>3.4.1 Assay Techniques in Clinical Chemistry: End Point assay, Differential assay, rate assays (fixed and continuous)</p>	
	<p><b>Laboratory Practice</b></p> <ul style="list-style-type: none"> <li>- Pipetting techniques</li> <li>- Dilution of concentrated solutions</li> <li>- Preparation of working solution from stock solutions</li> <li>- Components of spectrophotometer</li> <li>- Wave length selection for solutions</li> <li>- Demonstration of Beer's law</li> </ul>	<b>12 hrs</b>
<b>Week 2</b>	<p><b>4. Specimen types and collection, processing and preservation for Clinical Chemistry tests</b></p> <p>4.1 Common factors affecting quality of specimen for Clinical Chemistry tests</p> <p>4.2 Stability of analytes in biological specimens</p> <p>4.3 Preservation of specimen for Clinical Chemistry tests</p> <p>4.4 Transportation of specimen for Clinical Chemistry tests</p> <p><b>5. Carbohydrates</b></p> <p>5.1 Introduction to CHO's chemistry</p> <p>5.2 Metabolism of CHO's</p> <p>5.3 Digestion &amp; absorption of CHO's, Cellular metabolism of CHO's</p>	<b>8 hrs</b>
	<p><b>Laboratory practice on</b></p> <ul style="list-style-type: none"> <li>- Specimen collection and processing</li> <li>- Blood glucose measurement</li> </ul>	<b>12 hrs</b>
<b>Week 3</b>	<p><b>6. Renal Function Test</b></p> <p>6.1 Introduction to anatomy &amp; physiology of renal</p>	<b>8 hrs</b>

	<p>system</p> <p>6.2 Non- protein nitrogenous (NPN) substances</p> <p>6.2.1 Metabolism and clinical utility</p> <p>6.2.2 Assay methods</p> <p>6.2.3 Urea and/or Blood Urea Nitrogen, Metabolism and clinical utility, Assay methods</p> <p>6.2.4 Uric acid: Metabolism and clinical utility, Assay methods</p> <p>6.2.5 Creatinine: Metabolism and clinical utility; Assay methods; Clearance tests: Creatinine clearance test</p>	
	<p><b>Laboratory practice on</b></p> <p>- Renal function tests</p>	<b>12 hrs</b>
<b>Week 4</b>	<p><b>7. Protein</b></p> <p>7.1 Physical property of protein</p> <p>7.2 Protein metabolism, excretion</p> <p>7.3 Abnormal protein metabolites</p> <p>7.4 Classification of protein</p> <p>7.5 Plasma protein &amp; their physiological importance</p> <p>7.6 Quantitative analysis of protein in biological fluids such as urine, plasma, serum, CSF</p> <p>7.7 Determination of protein nitrogen by Kjeldahl technique</p> <p>7.8 Biuret and BCG reaction</p> <p>7.9 Electrophoretic separation of serum protein</p>	<b>8 hrs</b>
	<p><b>Laboratory Practice</b></p> <p>- Measurement of proteins and albumin</p>	<b>12 hrs</b>
<b>Week 5</b>	<p><b>8. Lipids &amp; Lipoproteins</b></p> <p>8.1. Lipid &amp; Lipoprotein metabolism</p> <p>8.2. Classification of lipids and lipoproteins</p>	<b>8 hrs</b>

	8.3. Clinical significance of lipid profile tests 8.4. Determination of TAG, total Cholesterol, LDL-c, HDL-c in pathological disorders	
	<b>Laboratory Practice</b> - Determination of serum lipid levels	<b>12 hrs</b>
<b>Week 6</b>	<b>9. Liver Function Studies</b> 9.1. Introduction 9.2. Physiological role of the liver 9.3. Tests for liver function assessment 21.12.1. Bilirubin 21.12.2. Bilirubin Metabolism 21.12.3. Bilirubin Quantitation methods (Direct & total) 21.13. Clinical significance & Interpretation of bilirubin measurement	<b>8 hrs</b>
	<b>Laboratory Practice</b> - Liver function tests	<b>12 hrs</b>
	<b>Mid Exam</b>	
<b>Week 7</b>	<b>10. Diagnostic Enzymology</b> 10.1. Introduction (enzymology from a clinical point of view) 10.2. Classification and Nomenclature of enzymes 10.3. Mechanism of enzymes action 10.4. Nature of enzymes regarding energy requirements of chemical reaction 10.5. Enzyme kinetics (substrate concentration, temperature, cofactors, coenzymes, inhibitors, pH) 10.6. Enzyme Assay Techniques 10.6.1. Fixed time (fixed time kinetic) assay techniques	<b>8hrs</b>

	<p>10.6.2. Continuous (kinetic) monitoring assay techniques</p> <p>10.7. Plasma specific versus non- plasma specific enzymes</p> <p>10.8. Factors affecting enzyme level in plasma or serum</p>	
	<p><b>Laboratory practice on</b></p> <p>- Laboratory practice on Measurement of enzymes</p>	<b>12 hrs</b>
<b>Week 8</b>	<p>10.9. Selected Enzyme Tests</p> <p>10.9.1. The transferases (AST, ALT, GGT)</p> <p>10.9.2. The phosphatases</p> <p>10.9.3. Lactate dehydrogenase</p> <p>10.9.4. Creatine kinase</p> <p>10.9.5. Amylase</p> <p>10.9.6. Lipase</p> <p>10.10. Principles &amp; techniques for enzyme determination</p> <p>10.11. Calculation of enzyme activity (volume activity)</p> <p>10.12. Clinical significance, reporting, documentation and interpretation of enzyme results</p> <p><b>11. Function &amp; Measurement of Electrolytes &amp; blood gas</b></p> <p>11.1. Function of electrolytes</p> <p>11.2. Electrolytes and water balance</p> <p>11.3. Condition of fluid imbalance</p> <p>11.4. Conditions of electrolyte imbalance</p> <p>11.5. Electrolytes and acid-base balance</p> <p>11.6. Disturbances of acid – base balance</p> <p>11.7. Measurement of electrolytes like sodium, potassium, chloride, calcium...</p> <p>11.8. Physiological function, regulation and assay principles of blood gases</p>	<b>8 hrs</b>

	<b>Laboratory practice on</b> - Measurement of electrolytes	<b>12 hrs</b>
<b>Week 9</b>	<b>12. Principles of Immunochemical techniques</b> 12.1. Fluorescent polarization immunoassay (FPIA) 12.2. Chemiluminescence immunoassay Radio 12.3. Immunoassay (RIA) <b>13. Endocrine Hormones</b> 13.1. Introduction 13.1.1. Definition and Classification of endocrine hormones 13.1.2. Mechanisms of action (organ/system level), control and regulation of endocrine hormones 13.2. Posterior pituitary hormones 13.2.1. Nature of posterior pituitary hormones 13.2.2. Major abnormalities (diseases) associated with posterior pituitary hormones 13.3. Anterior pituitary hormones 13.3.1. Nature of anterior pituitary hormones 13.3.2. Major abnormalities (diseases) associated with anterior pituitary hormones 13.4. Laboratory diagnosis of pituitary hormones	<b>8 hrs</b>
	<b>Laboratory practice on</b> - Measurement of electrolytes	<b>12 hrs</b>
<b>Week 10</b>	13.4.1 Adrenocortical hormones 13.4.2 Regulation, mechanisms of action, metabolism and clinical significance of adrenocortical hormones 13.4.3 Determination of adrenocortical hormones 13.5 Gonadal hormones (steroids) 13.5.1 Regulation, mechanisms of action, metabolism and clinical	<b>11 hrs</b>



	<p>significance of male and female sex hormones</p> <p>13.5.2 Determination of sex hormones testosterone, FSH, LH, estradiole etc.</p> <p>13.5.3 HCG stimulation tests</p> <p>13.6 Adrenomedullary Hormones</p> <p>13.6.1 Regulation, mechanisms of action, metabolism and clinical</p> <p>significance of adrenomedullary hormones</p> <p>13.6.2 Determination of adrenomedullary hormones</p> <p>13.7. Parathyroid Hormones</p> <p>13.7.1 Regulation, mechanisms of action, metabolism and clinical</p> <p>significance of parathyroid hormones</p> <p>13.7.2 Determination of parathyroid hormones</p> <p>13.8. Thyroid hormones</p> <p>13.8.1. Regulation, mechanisms of action, metabolism and clinical</p> <p>significance of thyroid hormones</p> <p>13.8.2. Determination of thyroid hormones</p> <p>Regulation, mechanisms of action, metabolism, determination and</p> <p>clinical significance of calcitonin</p>	
	Laboratory practice on	<b>9 hrs</b>
	Measurement of hormones	
<b>Week 11</b>	<p>13.9. Hormones of the Gastrointestinal Tract</p> <p>13.9.1. Regulation, mechanisms of action, metabolism and clinical</p> <p>significance of pancreatic hormones</p> <p>13.9.2. Determination of gastrointestinal hormones</p> <p>13.10. Pancreatic Hormones</p>	<b>11 hrs</b>

	<p>13.10.1. Regulation, mechanisms of action, metabolism and clinical significance of pancreatic hormones</p> <p>13.10.2. Determination of pancreatic hormones</p> <p><b>14. Tumor markers</b></p> <p>14.1. Definition and use of tumor markers</p> <p>14.2. Classification of tumor markers (chemical makeup, origin)</p> <p>14.3. Determinations of tumor markers</p> <p>14.4. Clinical significance and interpretation of tumor markers</p>	
	<b>Laboratory practice on</b>	<b>9 hrs</b>
<b>Week 12</b>	<p><b>15. Automation in Clinical chemistry</b></p> <p>15.1. Definition of automation</p> <p>15.2. Component parts of automated analyzers</p> <p>15.3. Principles of current automated systems</p> <p><b>16. Quality Assurance in Clinical Chemistry</b></p> <p>16.1. Pre-analytical quality assurance</p> <p>16.2. Analytical quality assurance</p> <p>16.3. Post-analytical quality assurance</p>	<b>11hrs</b>
	<p><b>Laboratory practice on:</b></p> <p>- Automation in clinical chemistry 9 hrs</p>	<b>9 hrs</b>
<b>Week 13</b>	<p><b>17. Introduction to toxicology</b></p> <p>17.1. Introduction to Toxicology</p> <p>17.2. Definition, areas of toxicology, scope, application, and the medical laboratory scientist role in toxicology</p> <p>17.3. Nature of toxic responses, routes of poisoning</p> <p>17.4. Potential causes of toxicity</p> <p><b>18. General Principles of Toxicology</b></p> <p>18.1. Basic principles of toxicology</p>	<b>11 hrs</b>

	<p>18.2.Toxicity parameters: the chemical form, routes and sites of exposure, duration and frequency of exposure (acute, sub-acute, chronic), Dose-response effects.</p> <p>18.3.Types of toxic reactions; Variation in toxic responses; Toxicokinetics</p> <p>18.4. Mechanisms of toxicity</p> <p>18.4.1. Toxication versus detoxication</p> <p>18.4.2. Toxicant – target reactions</p> <p>18.4.3. Effects of toxicant on target molecule</p> <p>18.4.4. Toxicant induced cellular damages</p> <p>18.5. Repair –disrepair</p>	
	<p><b>Laboratory practice on</b> - Toxin analysis</p>	<b>9 hrs</b>
<b>Week 14</b>	<p><b>19. Introductory Molecular Toxicology</b></p> <p>19.1. Introduction to mutagenesis</p> <p>19.2. Carcinogenesis and reproductive toxicology</p> <p>19.3. Examples of mutagens, carcinogens and teratogens</p> <p>19.4. Tests of mutagenesis teratology and other animal tests</p> <p><b>20. Toxic Agents of Pharmaceutical Importance</b></p> <p>20.1. Insecticides, Rodenticides, Herbicides, Fungicides, Solvents and vapors: Benzene, chloroform, carbon tetra chloride, other halo alkanes and halo alkenes, Ethyl alcohol, Methanol, Glycols, others</p> <p>20.2. Toxic effects of some animal venoms and plant toxicants</p>	<b>11 hrs</b>

	<p>21. Principles of Analytic Toxicology</p> <p>21.1. Applications in general and forensic toxicology and clinical practice</p> <p>21.2. Interpretation of analytic results</p> <p>22. Toxicology in Clinical Practice</p> <p>22.1. Treatment of Poisoning</p> <p>22.2. Texico kinetics and management of a poisoned patient:</p> <p>22.3. Diuresis, Dialysis, lavage, purgation, whole bowel irrigation, and other general care procedure</p> <p>22.4. Specific poisoning and antidotes</p>	
	<p><b>Laboratory practice on</b></p> <p>- Toxin analysis</p>	<b>9 hrs</b>
<b>Week 15-18</b>	Hospital Laboratory practicum	<b>9 hrs</b>
<b>Week 19-20</b>	Written and practical examination	

## **21.23. Global trend Module Syllabus**

**Module name: Global trend**

**Module Code: GITr-M4361**

**Module EtCTS: 3**

**Program: BSc in Medical Laboratory**

**Year: IV**

**Module Duration: 20 weeks**

**Prerequisite: Basics to Medical Laboratory Science**

### **Module Description:**

The course is designed to familiarize learners with the nature and development of international relations and global issues. It deals with nations, states, national interest, cooperation and conflict among states, and the role of state and non-state actors in the international system. Additionally, it explains the nature of international law, global political economy and the nexus between regionalism and globalization. It also critically examines the contemporary global issues and how the international community is trying to address them. It is organized to systematically examine international issues by employing different theories and providing concrete examples from different parts of the world. Finally, yet importantly, after providing rigorous understanding of how the international system functions, it will equip learners to consciously observe and critically understand the Ethiopia's Relations with the outside world.

- ✓ Learning outcomes:
- ✓ After completing this course, students will be able to:
- ✓ Understand nations, nationalism and states
- ✓ Explain the nature and historical development of international relations
- ✓ Examine the extent and degree of influence of state and non-state actors in the international system
- ✓ Gain basic knowledge of the major theories of International Relations and develop the ability to
- ✓ critically evaluate and apply such theories
- ✓ Elucidate national interest, foreign policy and diplomacy
- ✓ Assess the overriding foreign policy guidelines of Ethiopia in the past and present

- ✓ Explicate the nature and elements of international political economy
- ✓ Examine the roles major international and regional institutions play in world politics
- ✓ Explore Ethiopia 's role in regional, continental and global institutions and affairs
- ✓ Critically evaluate the major contemporary global issues.

#### **21.24. Quality Assurance in Medical Laboratory Module Syllabus**

**Module name: Quality Assurance in Medical Laboratory**

**Module Code: MeLS-M4373**

**Module EtCTS: 3**

**Program: BSc in Medical Laboratory Sciences**

**Year: IV**

**Module duration:20 weeks**

**Pre-requisite: None**

**Module Description:** This module is designed to prepare the undergraduate Medical Laboratory

Science students to equip with the basic concepts of quality assurance and the ability to apply the concept of quality assurance in the health laboratory to provide quality laboratory services.

#### **Module Competencies**

- Evaluate test results and methods; develop and update standard operating procedures to ensure the accuracy of tests.
- Design and implement quality enhancement plan to ensure the delivery of quality laboratory services.
- Promote and apply laboratory safety practices and standard operating procedures.
- Apply international medical laboratory quality standards.
- Confirm and verify laboratory test results through in-depth knowledge of scientific methods, principles and instrumentation theory.
- Monitor and maintain proper functioning of medical laboratory equipment and reagents.

- Apply computer skills for data storage, analysis and report generation.

**Learning Outcomes:**

To meet the above module objective, the student will be expected to:

- Apply laboratory quality assurance system
- Identify different types of quality controls
- Evaluate and select different laboratory methods
- Maintain specimen integrity in the laboratory
- Perform quality control test
- Apply standard operating procedure update SOPs regularly
- Understand safety need of laboratory
- Apply universal safety precaution in medical laboratory
- Understand medical laboratory quality standards
- Apply quality control to monitor and maintain proper functioning of medical laboratory equipment and reagents

**Teaching and learning methods**

- Interactive lecture and discussions
- Laboratory Demonstration

**Teaching and learning materials**

Learning guides and checklists

- Textbooks
- Reference manual
- Writing board
- Posters/Pictures
- LCD Projector
- White board marker
- Laptop

**Learning Assessment methods (both formative and summative)**

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Test 3: 5-10%

- Practical Examination: 10%
- Assignment, Projects, field reports with presentations: 10%
- Lab reports: 5%
- Oral examination: 5%

#### Reference Books

1. Endris Mekonnen; Health Laboratory Management and quality assurance lecture note,2004.
2. Wubet Birhan & Shimeles Assefa. Quality Assurance in medical laboratory, lecture note,2007.
3. Lawrence A. Kaplan, Clinical Chemistry, theory, analysis, correlation, 4th edition, 2003.
4. . Teitz, Text book of Clinical Chemistry, 2nd edition, 1992.
5. Teitz, Fundamentals of clinical chemistry, 5th edition,2000.
6. Cheesbrough Monica, Medical Laboratory manual for Tropical countries, Vol. 1,1992

#### Module Schedule

Week	Essential contents and learning methods and activities	Hours
Week 1	<b>1. Introduction to Quality assurance</b> - Definition of important terms in QA, - Essential components of QS, - Aspects of and Characteristics of QA, - Basic components of QA program, - The purpose of health laboratory - Errors in the clinical laboratories - Types of Diagnostic tests	4 hrs
Week 2	2. Accuracy and precision 3. Indicators of values of Diagnostic tests - Sensitivity, Specificity, Test Efficiency, Predictive value	4 hrs
Week 3	4. The Quality assurance cycle 5. Pre analytical phases of QA	6 hrs



	<ul style="list-style-type: none"> <li>• Method selection, Method evaluation, Establishing a working plan</li> <li>- Method evaluation in the absence of a comparative method</li> <li>- Linearity check, Replicate experiment</li> <li>- Recovery studies, Interference experiment</li> <li>- Method evaluation in the presence of a comparative methods <ul style="list-style-type: none"> <li>o Check for Precision, Check for accuracy</li> <li>o Linear regression and correlation,</li> <li>o Correlation co-efficient</li> </ul> </li> </ul>	
Week 4	<ul style="list-style-type: none"> <li>• Specimen Management and Standard Operating Procedures</li> <li>• Specimen integrity, Specimen collection manual</li> <li>• Standard Operating Procedures (SOPs): Definition, Purposes, Benefits</li> <li>• Common Elements of SOPS <ul style="list-style-type: none"> <li>▪ SOPs for specimen collection and transport</li> <li>▪ SOPs for Specimen Receipt and Processing</li> <li>▪ SOPs for Analytic and Post-Analytic Processes</li> </ul> </li> <li>• Who writes SOPs</li> <li>• Characteristics of Good Sops</li> <li>• Common Problems with SOPs</li> <li>• Successful Implementation of SOPs requires</li> </ul>	6 hrs
Week 5	Laboratory Visit	3 hrs
Week 6	<p>6. Analytical and Post analytical Phase of Quality Assurance</p> <ul style="list-style-type: none"> <li>• Analytical phase of Quality Assurance</li> <li>• Internal and external controls <ul style="list-style-type: none"> <li>- Source of External controls</li> <li>- Internal quality control</li> </ul> </li> </ul>	

	<ul style="list-style-type: none"> <li>- Types of internal quality control materials</li> <li>- Characteristics of good control materials</li> <li>- Control versus calibrator</li> <li>- Preparation of quality control samples</li> <li>- Practical evaluation and interpretation of quality control data</li> <li>- Qualitative tests</li> <li>- Quantitative tests systems</li> <li>• Levey Jennings or the Shewhart control charts</li> <li>• Basic quality control rules: <ul style="list-style-type: none"> <li>- Similarities in performance characteristics for quality control and diagnostic tests</li> <li>- Approaches used to interpret patient samples in quality control</li> </ul> </li> <li>• Absurd value check, Duplicate analysis</li> <li>• Delta check, Samples, False sense of security</li> <li>• Post Analytical Quality Assurance</li> <li>- Documentation of tests results</li> <li>- Interpretation and reporting of tests results</li> </ul>	
	Test -3	
Week 8	<p>7. Safety in Clinical Laboratory</p> <p>8. Determination of Reference Interval</p> <ul style="list-style-type: none"> <li>• Sources of reference ranges / Normal ranges</li> <li>• Establishment of RR/NR</li> </ul>	
	<p>9. External Quality Assessment</p> <ul style="list-style-type: none"> <li>▪ External Quality Assessment strategies</li> <li>- Proficiency Testing</li> <li>- On site supervision</li> <li>- Blind-re-checking</li> </ul>	6 hrs

	<ul style="list-style-type: none"> <li>▪ Methods external quality assessment</li> <li>▪ Objectives of external quality assessment</li> <li>▪ Evaluation of survey samples</li> </ul> <p>10. An Over View of Accreditation and Proficiency</p>	
Week 9	Laboratory Visit	3 hrs
Week 10-12	Laboratory Practice	40 hrs
Week 13-14	Final exam	

### **21.25. Health Laboratory and Supply Chain Management Module Syllabus**

**Module name: Health Laboratory and Supply Chain Management**

**Module Code: MeLS-M4383**

**Module EtCTS: 3**

**Program: BSc in Medical Laboratory Sciences**

**Year: IV**

**Module duration:20 weeks**

**Pre-requisite: None**

**Module Description:** This module is designed to prepare the undergraduate Medical Laboratory

Science Students to be competent health services manager in general and health laboratory manager in particular by applying the basic concept and principle of health and laboratory management. It is also designed to prepare the students with the ability to apply the principles, concept and practices of supply chain management.

#### **Module Competencies**

- Participate in Management, Leadership and Governance of the health care system in general and medical laboratory in particular.
- Setup specification for laboratory equipment, supplies, chemicals and other logistics

Learning Outcomes:

**To meet the above module objective, the student will be expected to:**

- Describe concept and theories of management
- Explain basic management functions
- Describe function, qualities and types of leadership
- Understand level of health services and health management information system

- Lead and manage organization of health care system.
- Understand the concepts of human resource management
- Apply concepts of management and management skill to supervise medical/clinical laboratory personnel
- Performance appraisal of laboratory personnel
- Identify laboratory physical arrangement obstacles that affects working environment

### **Apply universal safety precaution in medical laboratory**

- Describe material resource and financial management
- Prepare specification of equipment's, chemicals, supplies and other logistics
- Actively participate in materials and supplies inventory management

### **Teaching and learning methods**

- Interactive lecture and discussions
- Laboratory demonstration

### **Teaching and learning materials**

- Learning guides and checklists
- Textbooks
- Reference manual
- Writing board
- Posters/Pictures
- LCD Projector
- White boardmarker
- Laptop

### **Learning Assessment methods (both formative and summative)**

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Test 3: 5-10%
- Practical Examination: 10%
- Assignment, projects, field reports with presentations: 10%
- Lab reports: 5%
- Oral examination: 5%

## Reference Books

1. Endris Mekonnen; Health Laboratory Management and quality assurance lecture note, 2004.
2. Wubet B, Shimelis A. Health laboratory management lecture note series for medical laboratory technology students, 2007.
3. Waqtola Cheneke. Health Laboratory Management module for Medical Laboratory Science students. Jimma University, 2009.
4. Wubet Birhan & Shimeles Assefa. Quality Assurance in medical laboratory, lecture note, 2007
5. Micheal Bishop; Clinical chemistry principles, procedures and correlation; 4th edition, 2000.
6. Lionel A. Varnadoe. Medical Laboratory Management and Supervision, 1996.
7. Denis M. Harmening. Laboratory management; principles and processes, 2nd edition 2007.
8. Hudson J. Principles of clinical laboratory management, a study guide and work book. Pearson Education, Inc. Upper Saddle River, New Jersey, 2003.
9. Attener R, Warner R. Introduction to management. Kent publishing. Co. Boston. 1996.
10. Besrch C. Laboratory information systems continue to add features that contribute to maximizing personnel and cost containment. Medical Laboratory Observer, Jan, 2003.
11. Svirbely JR, Smith JW, and Speicher CE. (eds) Snyder JR and Wilkinson D, Computers and Laboratory Information Systems, Management in Laboratory Medicine, 299-314, 1997.
12. Hoffer J. George J. Valacich J. Modern System Analysis and Design. 4th edition, Prentice Hall, 2005
13. Lawrence A. Kaplan, Clinical Chemistry, theory, analysis, correlation, 4th edition, 2003.
14. Teitz, Text book of Clinical Chemistry, 2nd edition, 1992.
15. Teitz, Fundamentals of clinical chemistry, 5th edition, 2000.
16. Cheesbrough Monica, Medical Laboratory manual for Tropical countries, Vol. 1, 1992

## Module Schedule

Week	Essential contents and learning methods and activities	Hour
Week 1	<p>11. Introduction to Leadership, management and Governance</p> <ul style="list-style-type: none"> <li>– Definition, Importance of leadership and management</li> <li>– Leader Vs management</li> <li>– Management levels</li> </ul> <p>12. The management functions</p> <ul style="list-style-type: none"> <li>- Planning, Organizing, Directing, Staffing, Controlling</li> </ul> <p>13. Organization of health laboratory service in Ethiopia</p>	6 hrs
Week 2	<p>14. Power, Authority, Delegation and Decentralization</p> <ul style="list-style-type: none"> <li>– Definition of power, Types of power</li> <li>– Definition of Authority, Staff authority</li> <li>– Definition of delegation, Advantage of delegation, Barriers of delegation</li> <li>– Tasks of effective delegation, Decentralization, Advantage, Limitation</li> </ul> <p>15. Effective communication</p> <ul style="list-style-type: none"> <li>- Definitions, Channels of communication</li> <li>- Media for communication, Barriers of communications</li> </ul>	6 hrs
Week 3	<p>16. Job analysis, work descriptions and work groups</p> <ul style="list-style-type: none"> <li>- Job analysis, Work description, Selection process, Performance evaluation, Workgroups</li> </ul>	4 hrs
	Test	
Week 4	<p>Human Resource Management</p> <ul style="list-style-type: none"> <li>• Recruitment, hiring and orientation of laboratory personnel</li> <li>– General considerations in employee selection</li> <li>– Selection process, Steps in hiring, Recruitment of applicants</li> <li>– Selection of new employee, Orientation and training</li> <li>• Performance appraisal of laboratory personnel</li> <li>- Definitions, the evaluators, Form to use in appraisal system</li> </ul>	6 hrs

	<ul style="list-style-type: none"> <li>- Employee comparison, Critical incidents</li> <li>- Self-appraisal, Salary increase</li> <li>• Staff development</li> <li>– Introductions, Kinds of staff development program</li> <li>– Responsibilities of persons involved in staff development</li> </ul>	
Week 5	<p>18. Purchasing and Management of material resources</p> <ul style="list-style-type: none"> <li>- Definition of terms – Purchasing, supplies, equipment’s,</li> <li>- The bidding processes</li> <li>- Choosing equipment, Inventory</li> <li>- Inventory of equipment, Discarding equipment, Supply inventory control</li> <li>- Storing supplies, Maintenance of equipment</li> </ul> <p>19. Supply chain management</p> <ul style="list-style-type: none"> <li>• Definition</li> <li>• History</li> <li>• Key decisions in Supply Chain Management</li> <li>• The trade-off between efficiency and responsiveness</li> <li>• Benefits of Supply Chain Management</li> <li>• Practices in Supply Chain Management (overview, Collaborative demand planning and replenishment, Collaborative production, Collaborative logistics planning)</li> </ul> <p>20. Management of financial resource</p> <ul style="list-style-type: none"> <li>• Types of budgets, Management teamwork in preparing a budget</li> <li>• Capital budget, Controls</li> </ul>	
Week 7	<p>21. Management of time</p> <p>22. Laboratory safety management</p> <p>23. Laboratory quality management</p> <p>24. Laboratory design and space utilization</p>	4 hrs
	<b>Test 2</b>	
Week 8	25. Introduction to Quality assurance	4 hrs

	<ul style="list-style-type: none"> <li>- Definition of important terms in QA,</li> <li>- Essential components of QS,</li> <li>- Aspects of and Characteristics of QA,</li> <li>- Basic components of QA program,</li> <li>- The purpose of health laboratory</li> <li>- Errors in the clinical laboratories</li> <li>- Types of Diagnostic tests</li> </ul>	
Week 9	<p>26. Accuracy and precision</p> <p>27. Indicators of values of Diagnostic tests</p> <ul style="list-style-type: none"> <li>- Sensitivity, Specificity, Test Efficiency, Predictive value</li> </ul>	4 hrs
Week 10	<p>28. The Quality assurance cycle</p> <p>29. Pre analytical phases of QA</p> <ul style="list-style-type: none"> <li>• Method selection, Method evaluation, establishing a working plan</li> <li>- Method evaluation in the absence of a comparative method</li> <li>- Linearity check, replicate experiment</li> <li>- Recovery studies, Interference experiment</li> <li>- Method evaluation in the presence of a comparative methods</li> <li>o Check for Precision, Check for accuracy</li> <li>o Linear regression and correlation,</li> <li>o Correlation co-efficient</li> </ul>	6 hrs
Week 11	<ul style="list-style-type: none"> <li>• Specimen Management and Standard Operating Procedures</li> <li>• Specimen integrity, Specimen collection manual</li> <li>• Standard Operating Procedures (SOPs): Definition, Purposes, Benefits</li> <li>• Common Elements of SOPS</li> <li>▪ SOPs for specimen collection and transport</li> <li>▪ SOPs for Specimen Receipt and Processing</li> <li>▪ SOPs for Analytic and Post-Analytic Processes</li> </ul>	6 hrs



	<ul style="list-style-type: none"> <li>• Who writes SOPs</li> <li>• Characteristics of Good Sops:</li> <li>• Common Problems with SOPs</li> <li>• Successful Implementation of SOPs requires</li> </ul>	
Week 12	Laboratory Visit	3 hrs
Week 13	<p>30. Analytical and Post analytical Phase of Quality Assurance</p> <ul style="list-style-type: none"> <li>• Analytical phase of Quality Assurance</li> <li>• Internal and external controls <ul style="list-style-type: none"> <li>- Source of External controls</li> <li>- Internal quality control</li> <li>- Types of internal quality control materials</li> <li>- Characteristics of good control materials</li> <li>- Control versus calibrator</li> <li>- Preparation of quality control samples</li> <li>- Practical evaluation and interpretation of quality control data</li> <li>- Qualitative tests</li> <li>- Quantitative tests systems</li> </ul> </li> <li>• Levey Jennings or the Shewhart control charts</li> <li>• Basic quality control rules: <ul style="list-style-type: none"> <li>- Similarities in performance characteristics for quality control and diagnostic tests</li> <li>- Approaches used to interpret patient samples in quality control</li> </ul> </li> <li>• Absurd value check, Duplicate analysis</li> <li>• Delta check, Samples, False sense of security</li> <li>• Post Analytical Quality Assurance <ul style="list-style-type: none"> <li>- Documentation of tests results</li> <li>- Interpretation and reporting of tests results</li> </ul> </li> </ul>	6 hrs

	<b>Test 3</b>	
Week 14	31. Safety in Clinical Laboratory 32. Determination of Reference Interval • Sources of reference ranges / Normal ranges • Establishment of RR/NR	6 hrs
Week 15	33. External Quality Assessment ▪ External Quality Assessment strategies - Proficiency Testing - On site supervision - Blind-re-checking ▪ Methods external quality assessment ▪ Objectives of external quality assessment ▪ Evaluation of survey samples 34. An Over View of Accreditation and Proficiency	6 hrs
Week 16	Laboratory Visit	3 hrs.
Week 17-18	Laboratory Practice	40hrs.
Week 19-20	Final exam	

### 21.26. Health service management and policy Module syllabus

**Module Name: Health service management and Policy (SPH 4)**

**Module Code:SPH-M4392**

**Module EtCTS: 3**

**Program: BSc in Medical Laboratory Sciences**

**Year: III**

**Module Duration: 20 weeks**

**Pre-requisite: None**

**Module Description:** This Module is designed for BSc Medical Laboratory Science students to equip

with the knowledge, skill and attitude needed to apply the principles of health policy,

management and leadership in a culturally sensitive manner with full participation of the community and other stakeholders. This Module includes health service management, health economics and health informatics and will be addressed through interactive lecture, Seminar presentations in class room teaching and structured feedbacks in various health sectors and real community setup.

### **Module Objective**

At the end of this module, students will be able to apply principles and methods of management and leadership for effective and efficient management of the Ethiopian healthcare system.

### Module Competencies

**The core professional competencies where this practice Module aimed at achieving are:**

- Analyze the concept of development and organization of the health system
- Apply the concept of management and leadership in the health sector
- Ensure adequate health services coverage, utilization and quality
- Apply the principles of health informatics in Medical Laboratory Science practice

### Learning Outcomes

In order to achieve core competencies, students at the end of this Module will be able to:

- ✓ Describe the Ethiopian health system including historical development, organization, structure, approaches, policy, strategy, regulations and programs
- ✓ Apply principles and functions of management as well as leadership in the health sector
- ✓ Apply the principles of economics in the health sector including issues of equity and financing.
- ✓ Describe the principles and components of the national health management information system
- ✓ Analyze the concepts of health care coverage, utilization and quality with focus in the Ethiopian health system
- ✓ Demonstrate skills for effective communication with individuals, families, communities, health sector staff, local leadership and development partners with sensitivity to personal and cultural factors for the promotion of health and prevention of diseases
- ✓ Demonstrate professional values and behavior in interaction with individuals, families

and communities.

- ✓ Demonstrate key public health values, attitudes and behaviors such as commitment to equity and social justice, recognition of the importance of the health of the community as well as the individual, and respect for diversity, self-determination, empowerment, and community participation.
- ✓ Show respect for peers and other health care professionals and the ability to foster a positive collaborative relationship with them.
- ✓ Demonstrate a habit of self-reflection, responsiveness to feedback and an on-going development of new skills, knowledge and attitude Search, collect, organize and interpret health and health-related information from different sources.
- ✓ Use information and communication technology to assist in health promotion and disease prevention measures for individuals and families.

### **Teaching-Learning Methods**

- Interactive lecture and discussion
- Small group learning activities: assignment, exercise, case study, game, role play
- Individual reading
- PHCU/Community-based learning and study trip: home visit, discussion with individuals and families to identify and solve problems, observation, PHCU visit, Zonal and District Health Department Visit, field visit, and targeted literature review based on community experience
- Student presentation
- Reflective portfolio and mentoring

### **Teaching-Learning Materials**

AV aids (LCD and computer or Overhead projector and transparencies, writing board and marker or chalk)

- Handouts of lecture materials
- Logbooks for entry of community experience

References (textbooks and articles)

1. Management Sciences for Health (MSH). Managers who lead. MSH, 2005.
2. Wagstaff A, Van Doorslaer E. Equity in the finance and delivery of health care.1995.
3. Shaw RP, Griffin CC. Financing health care in Sub-Saharan Africa through user

fees and insurance. The World Bank,1995.

4. Drumond MF, Stoddart CL, Torrance GW. Methods for the economic evaluation of health care programs. 1993: 39 -54.
5. Jira C. Health planning for health science students. Carter Center;2003.
6. Jira C, Feleke A, Mitike G. Health services management for health science students. Carter Center; 2003.
7. Berhane Y, Haile Mariam D, Kloos H. The epidemiology and ecology of health and disease in Ethiopia. Addis Ababa; Shama Books, 2006.
8. Haile Mariam D. Exploring Alternatives for Financing Health Care In Ethiopia: An Introductory Review Article.Ethiop J Health Dev 2001;15(3):153-163.
9. Pankhurst R. An introduction to medical history of Ethiopia, with a postscript by Asrat Woldeyes. Trenton, New Jersey;1990.
10. Walt G, Vaughan P. An Introduction to the Primary Health Care Approach in Developing Countries: A Review with Selected Annotated References. Ross Institute of Tropical Hygiene: London School of Hygiene and Tropical Medicine; 1981.

**Learning Assessment methods (both formative and summative)**

- Final Written Examination: 50% (The whole module)
- Test 1: 10 -15%
- Test 2: 10 -15%
- Practical Examination: 10%
- Assignment, projects, field reports with presentations: 10%
- Lab reports: 5%
- Oral examination: 5%

## **21.27. Research Methodology module syllabus**

**Module name: Research Methodology (SPH5)**

**Module Code:SPH-M4392**

**Module EtCTS: 3**

**Program: BSc in Medical Laboratory Sciences**

**Year: IV**

**Module Duration:20 Weeks**

**Mode of delivery: Block**

**Pre-requisite: None**

### **Module Description:**

This Module is designed for BSc in medical laboratory Science students to scientific inquiry, critical appraisal of literature and evidence, and research process. The student will acquire basic fundamental knowledge and skills to ethically conduct research in Medical Laboratory Science and application of common statistical packages to appreciate the importance of research in professional Medical Laboratory Science program.

This Module will be addressed through Interactive lecture, Seminar presentations, Skill Development in computer Lab (SDL) demonstration and supervised feedbacks in computer skill lab

### **Module Objective**

- At the end of this module, students will be able to undertake operational researches in a professional manner.

### **Module Competencies**

The core professional competencies where this practice Module aimed at achieving are:

- Apply basic principles of research method
- Critically appraise scientific literatures, select, and summarize findings
- Develop a research proposal following the steps of the research process
- Conduct basic and operational scientific research to solve community problem
- Utilize updated evidences in providing patient care

### **Learning Outcomes**

In order to achieve core competencies, students at the end of this Module will be able to:

- Discuss Elements of research project

- Conduct Literature review
- Demonstrate effective research writing and presentation skills
- Collect data and apply common statistical package for data processing, analysis
- Write research report
- Apply ethical principles relating to research
- Apply evidences-based patient care

### **Teaching-Learning Methods**

- Interactive lecture
- Exercises and assignments
- Proposal development
- Computer lab practice (Statistical software programs such as Epi Info and SPSS)

### **Teaching-Learning Materials**

- Text books
- Reference manual
- Writing board
- LCD Projector
- White board marker
- Laptop

### **Methods of Assessment Formative assessment**

- Critical appraisal of literature (20%)
- Developing a research proposal (30%)
- Written exam (50%)
- Possible Summative assessment areas for:
  - Document of Critical appraisal of literature
  - Document of Proposal
  - Practical lab Evaluation (PLE)
  - Compile document of Critical appraisal of literature
  - Compile computer statical package

### **Reference Books**

1. Getu Degu and Tegbar Yigzaw. Research Methodology: Lecture Note for Health Science Students. Ethiopian Public Health Training Initiative.2006

2. Nigel Bruce, Danniell Pope and Debbi Stanistreet: Quantitative methods for health research. A practical interactive guide to epidemiology and statistics
3. Denise F. polit, Chery Tatano Beck. Nursing research principle and methods 3rd edition 2003
4. Health research methodology: A Guide for Training in Research Methods, WHO 2nd Edition.2001
5. Varkevisser C, Pathmana than I. and Brownlee A. Designing and Conducting Health SystemsResearch projects (Volumes 1 and 2). Amsterdam: KIT Publishers, WHO/IDRC, 2003.
6. Proposal Writing for Health and Health-Related Research (Training Module 1). Addis Ababa, Ethiopia: The Health Department of the Ethiopian Science and Technology Commission in collaboration with The Ethiopian Public Health Association and Regional State Health Bureaus, June, 2005
7. Assefa M, Tessema F. Supplementary Readings for Research undertaking. Jimma, 2000:77.
8. Assefa M. Manual for undertaking research: the participatory approach learning by doing. Jimma: 2003:92.



## Module Schedule

week	Learning Activity	Hours
Week1	<b>Overview of the Module</b> <ul style="list-style-type: none"> <li>▪ Structure and design</li> <li>▪ Education strategies</li> <li>▪ Core competencies</li> <li>▪ Teaching and learning methods</li> <li>▪ Assessment methods</li> </ul>	1 hrs.
Week 2	<b>Introduction to research</b> <ul style="list-style-type: none"> <li>▪ Definition of research</li> <li>▪ Rationale for research</li> </ul>	2 hrs.
Week 3	<ul style="list-style-type: none"> <li>▪ Types of research</li> <li>▪ Features of health system research</li> <li>▪ The research process format</li> <li>▪ Identify and prioritize research topic</li> </ul>	2 hrs.
Week 4	<ul style="list-style-type: none"> <li>▪ Problem statement</li> <li>▪ Literature review</li> </ul>	2 hrs.
Week 5	<ul style="list-style-type: none"> <li>▪ Citation and Referencing styles</li> <li>▪ Conceptual frame work</li> </ul>	2 hrs.
Week 6	<ul style="list-style-type: none"> <li>▪ Formulation of research objectives</li> <li>▪ Research hypothesis/questions.</li> </ul>	2 hrs.
Week 7	Skill Development Lab <ul style="list-style-type: none"> <li>▪ Basic computer skill</li> <li>▪ Research software's Endnote application</li> <li>▪ Review a literature</li> </ul>	3 hrs.
Week 8	Research Methodology <ul style="list-style-type: none"> <li>▪ Qualitative and quantitative studies design <ul style="list-style-type: none"> <li>o Descriptive studies</li> <li>o Analytic studies design</li> </ul> </li> <li>▪ Source population and study population</li> <li>▪ Sample size and sampling methods</li> </ul>	2 hrs.

	<ul style="list-style-type: none"> <li>▪ Variables</li> </ul>	
Week 9	<ul style="list-style-type: none"> <li>▪ Validity and Reliability of measurements of tools</li> <li>▪ Data collection techniques</li> </ul>	2 hrs.
Week 10	<p>Skill Development Lab</p> <ul style="list-style-type: none"> <li>▪ Basic computer skill</li> <li>▪ Research software's Endnote application</li> <li>▪ Review a literature</li> </ul>	3 hrs.
Week 11	<ul style="list-style-type: none"> <li>▪ Plan for data collection and organization</li> <li>▪ Plan for data processing and analysis</li> <li>▪ Pre-testing the methodology</li> </ul>	2 hrs.
Week 12	<p>Ethical considerations</p> <ul style="list-style-type: none"> <li>▪ Plagiarism</li> <li>▪ Ethical concerns pertaining study subjects</li> <li>▪ Ethical issues in selected health researches</li> </ul>	2 hrs.
Week 13	<p>Skill Development Lab</p> <ul style="list-style-type: none"> <li>▪ Basic computer skill</li> <li>▪ Research software's End-note application</li> <li>▪ Review a literature</li> </ul>	3 hrs.
Week 14	<p>Ethical principles</p> <ul style="list-style-type: none"> <li>▪ Confidentiality</li> <li>▪ Autonomy</li> <li>▪ Veracity</li> <li>▪ Beneficence</li> <li>▪ non-malfeasance</li> <li>▪ Justice</li> <li>▪ Informed consent</li> </ul>	2 hrs.
Week 15	<ul style="list-style-type: none"> <li>▪ Work Plan</li> <li>▪ Budget Plan</li> </ul>	2 hrs.
Week 16	<p>Skill Development Lab</p> <ul style="list-style-type: none"> <li>▪ Methods of data processing and analysis (Epi Info, SPSS) endnote</li> </ul>	8 hrs.

Week 17	Skill Development Lab ▪ Methods of data processing and analysis (EPi Info, SPSS) endnote	2 hrs.
Week 18	▪ The concepts of scientific evidence and evidence-based practice o Definition of evidence-based practice (EBP) o Components of evidence-based practice (EBP) o Steps of evidence-based practice (EBP) ▪ Application of evidence to practice ▪ Critical appraisal of literature and utilization of evidence	2 hrs.
Week 19	Skill Development ▪ Students develop a research proposal ▪ Finalizing and reviewing the research proposal	2 hrs.
Week 20	Final Exam	

### **21.28. Student Research Proposal module syllabus**

**Module name: Student Research Proposal**

**Module Code:MeLS-M4403**

**Module EtCTS: 2**

**Program: BSc in Medical Laboratory Sciences**

**Year: IV**

**Module duration: 40 weeks**

Pre-requisite: Research Methodology

Module Description:

- This module is intended to prepare learners to design and conduct operational health research.

**Module competencies:**

- Design and conduct problem solving operational and basic research projects.

Learning outcomes

- Conduct literature review

- Develop research proposal

- Conduct research
- Analyze data and make appropriate interpretation of findings
- Write a scientific research report
- Disseminate research findings

### **Teaching-Learning Methods**

- Supervised research
- Portfolio

### **Teaching learning material**

- AV aids (LCD and computer, writing board and marker or chalk)
- Computers with data analysis software and internet access

### **Formative assessment and Summative assessment**

- Developing a research protocol (40%)
- Final research report (30%)
- Oral presentation of research finding (30%)

### **References**

1. Makonnen Asefa. Manual for Research Undertaking: the participatory approach, learning by doing. 2003.
2. Getu Degu and TegbarYigzaw. Research Methodology: Lecture Note for Health Science Students. Ethiopian Public Health Training Initiative. 2006.
3. Corlien M. Varkevisser, Indra Pathmanathan, and Ann Brownlee. Designing and Conducting Health Systems Research projects: Volume 1 (Proposal Development and Field work). KIT/IDRC.2003
4. Corlien M. Varkevisser, IndraPathmanathan, and Ann Brownlee. Designing and Conducting Health Systems Research projects: Volume 2. KIT/IDRC.2003
5. HenrykDancygier: Clinical epidemiology. How to do clinical practice research
6. Margaret L. Brandeau: Operations research and health care. Handbook of methods and applications
7. Nigel Bruce, Danniell Pope and Debbi Stanistreet: Quantitative methods for health research. A practical interactive guide to epidemiology and statistics
8. Ann Bowling: Research methods in health. Investigating health and health service.

## Module Schedule

Week	Content	Time
Week1- 12	Proposal Development	
Week13-20	Data collection	
Week 21-25	Analysis and Write-up	
Week 26-29	Preparation for oral presentation	
Week 30	Oral presentation	

### 21.29. Entrepreneurship course syllabus

**Course Title: Entrepreneurship**

**Module EtCTS:3 EtCTS**

**Target group: BSc in Medical Laboratory Sciences**

**Course code: ENps-M4411**

#### **Course Description:**

This course consists of seven chapters. Chapter one deals with nature of entrepreneurship. Chapter two addresses the concept of business planning. Chapter three discusses about business formation in terms of ownership. Chapter four is about product development using systematic and procedural approach. Chapter five treats' basics of marketing. Chapter six, tries to identify the sources of financing for startup and when decided to grow. Chapter seven gives basics of business ethics and corporate social responsibility including the transition from start up to growth.

#### **Approach/Methods/Strategies**

- Interactive lectures
- Cooperative learning
- Brainstorming
- Discussion
- Role play
- Field visits
- Individual and group assignments and presentation
- Seminars

- Individual and group presentations
- Special needs/inclusive education expert consultancy

### **Assessment and Evaluation Methods**

- Tests 10%
- Assignment/group/assignment 10%
- Mid exam 30%
- Final exam 50%

### **Course Contents**

#### **1. The Nature of Entrepreneurship**

- 1.1. Introduction
- 1.2. Historical Origin of Entrepreneurship
- 1.3. Definitions of Entrepreneurship and Entrepreneur
- 1.4. Types of Entrepreneurs
- 1.5. Role of Entrepreneurs in Economic Development
- 1.6. Entrepreneurial Competence and Environment
  - 1.6.1. Entrepreneurial Mindset
  - 1.6.2. Entrepreneurship and Environment
- 1.7. Creativity, Innovation and Entrepreneurship
  - 1.7.1. Creativity
  - 1.7.2. Innovation
  - 1.7.3. From Creativity to Entrepreneurship

#### **2. Business Planning**

- 2.1. Introduction
- 2.2. Opportunity identification and evaluation
- 2.3. Business idea development
- 2.4. Business idea identification
  - 2.4.1. The Need will Your Business Fulfill for the Customers
  - 2.4.2. Good or Service will your Business Sell
  - 2.4.3. Identifies Potential Customer
  - 2.4.4. Strategy for Selling Goods or Services
  - 2.4.5. Relation between Business and Environment

2.5. Methods for Generating Business Ideas

2.6. Business Idea Screening

2.7. Concept of Business Plan

2.8. Developing a Business Plan

2.8.1. Business Planning Process

2.8.2. Essential Components of Business Plan

2.9. Sample Business plan Format

### **3. Business Formation**

3.1. Introduction

3.2. The Concept of Small Business Development

3.3. Forms of Business (A Short Explanation)

3.4. Definition and Role/Importance of MSEs in Developing Countries

3.4.1. Definition of MSEs

3.4.2. Role/Importance of MSEs in Developing Countries

3.5. Setting up Small Scale Business

3.6. Small Business Failure and Success Factors

3.6.1. Small Business Failure Factors

3.6.2. Small Business Success Factors

3.6.3. Classification of Enterprises in Ethiopian Context

3.7 Main Supporting Packages for MSEs Development in Ethiopia

3.8. Problems of Small-Scale Business in Ethiopia

3.9. Organizational Structure and Entrepreneurial Team Formation

3.9.1. Introduction

3.9.2. Designing the Organization

3.9.3. Building the Management Team and a Successful Organization Culture

### **4. Product/Service Development**

4.1. Introduction

4.2. The Concept of Product/Service Technology

4.3. Product/Service Development Process

4.4. Legal and Regulatory Frameworks for Entrepreneurs

4.5. Intellectual Property Protection/Product/Service Protection

- 4.5.1. What is Intellectual Property?
- 4.5.2. Patents
- 4.5.3. Trademarks
- 4.5.4. Copyrights
- 4.6. The Intellectual Property System in Ethiopia

## **5. Marketing**

- 5.1 Introduction
- 5.2 Meaning and Definitions of Marketing
- 5.3 Core Concepts of Marketing
  - 5.3.1 Needs, Wants and Demand
- 5.4 Importance of Marketing
- 5.5 Marketing Philosophies
- 5.6 Marketing Information Systems
  - 5.6.1 Marketing Research
  - 5.6.2 Marketing Intelligence
  - 5.6.3 Competitive Analysis
- 5.7 The Marketing Mix Strategy
  - 5.7.1 The 4 P's of Marketing/The Marketing Mix
  - 5.7.2 What Is Marketing Strategy
- 5.8 Selling and of Customer Service
  - 5.8.1 The Concept of Service
  - 5.8.2 The Concept of Customer
  - 5.8.3 Strategic Activities needed for Quality Customer Service Delivery
  - 5.8.4 Customer Handling and Satisfaction

## **6. Business Financing**

- 6.1 Introduction
- 6.2 Financial Requirements
- 6.3 Sources of Financing
  - 6.3.1 Internal Sources (Equity capital)
  - 6.3.2 External Sources (Debt capital)
- 6.4 Lease Financing



- 6.4.1 Types of Leases
- 6.5 Traditional Financing in Ethiopian (Equib/Edir, Etc.)
- 6.6 Crowd Funding
  - 6.6.1 How is Crowd Funding Different?
  - 6.6.2 The Benefits of Crowd funding
  - 6.6.3 Types of Crowd Funding
- 6.7 Micro Finances
  - 6.7.1 What is Micro Finance
  - 6.7.2 Importance of MFIs
  - 6.7.3 Micro Finances in Ethiopia
- 7. Managing Growth and Transition**
  - 7.1 Introduction
  - 7.2 Timmons Model of Entrepreneurship
  - 7.3 New Venture Expansion Strategies
    - 7.3.1 Introduction
    - 7.3.2 Methods of Growth
    - 7.3.3 The Ansoff Matrix – Growth Strategy
      - 7.3.3.1 Selecting a Product-Market Growth Strategy
    - 7.3.4 Expansion Issues
    - 7.3.5 Choosing not to Grow
  - 7.4 Business Ethics and Social Responsibility
    - 7.4.1 Introduction
    - 7.4.2 Three Approaches to Corporate
    - 7.4.3 Business Ethics Principles

### **21.30. Health informatics module syllabus**

**Module name: Health Informatics**

**Module code: HInf-M4421**

**Module EtCTS:5**

**Program: BSc Medical Laboratory Sciences**

**Year: IV**

**Module duration: 20 weeks**

**Pre-requisite: None**

#### **Module Description**

The module provides students a conceptual framework for understanding health informatics and information technology as applied in the healthcare environment. The course will include in- depth discussion of ‘meaningful use’ of technology in health care systems with emphasis on leveraging technology to improve quality and efficiency in care delivery. The course will also highlight successes and failures in implementing health information technology and the critical role that informaticists play in each step of the developmental process from idea inception through systematic implementation.

#### **Course Objectives**

The course will enable the student to:

- Understand basics of computer
- Understand the basics of computer network and Internet
- Define information management, information system (technology) and informatics
- Explain the basic theoretical concept that underlies informatics practice
- Identify how health informaticians process data into information and knowledge for health care tasks with the support of information technology to improve patient care
- Understand and practice the concept of health information system and its characteristics and describe the different types of Health information systems (routine and clinical information systems) specific to their disciplines.
- Explain how the use of an electronic health record system can affect patient care safety, efficiency of care practices, and patient outcomes
- Identify how ongoing developments in biomedical informatics can affect future uses and

challenges related to health information systems

- Describe the history and evolution of clinical decision support and state the fundamental requirements of effective clinical decision support systems
- Analyze how the integration of data from many sources assists in making clinical decisions and discuss how telehealth communication technologies support clinical care.
- Understand and practice the concept of information retrieval techniques.
- Enable students to identify and appreciate the areas of application of computers in the society, thereby stimulating their thought to regard computer as a tool for human use rather than a master
- Use computer system in numerous working areas

### **Teaching and learning methods**

- Lecture
- Demonstration
- Presentation and group discussion
- Laboratory practice
- Audiovisual
- Tutorial

### **Assessment/ evaluation & grading system**

<b>Method of assessment</b>	<b>Value (%)</b>
Test 1	<b>10</b>
Test2	<b>15</b>
Assignments	<b>15</b>
Practical exam	<b>30</b>
Final Exam	<b>30</b>
<b>Total</b>	

### **References**

2. Shortliffe EH. Medical Informatics. Second edition, Springer-Verlag, 2001
3. Bommel JHV, Musen MA. Handbook of Medical Informatics. Sringer-Verlag, 1977
4. Curriculum development center program, Component 6: Health Management

**Module Schedule**

Week	Lecture plane	Hrs.	Practice	Hrs.	Assignment	Hrs.
Chapter1	<ul style="list-style-type: none"> <li>- Introduction to computer</li> <li>- History of computer</li> <li>- Characteristics of computer</li> <li>- Components of computer</li> <li>- Types of computers</li> <li>- Hardware</li> <li>- Input</li> <li>- Output</li> <li>- Processing devices</li> <li>- Memory</li> <li>- Software</li> <li>- System software</li> <li>- Operating system</li> <li>- GUI</li> <li>- Cmd based OS</li> <li>- Utility soft wares</li> <li>- Application software</li> </ul>	2	<ul style="list-style-type: none"> <li>Identify the types of computers</li> <li>- Observe and identify the components of computer</li> <li>- Distinguish inputs with output devices</li> <li>- Observe the processing devices</li> <li>- Identify the different memories available from computer system</li> <li>- Operating system installation</li> <li>- Demonstrate GUI</li> <li>- Demonstrate cmd</li> <li>- Demonstrate Utility soft wares</li> <li>- Demonstrate basic types of applicationsoftware</li> <li>- Practice on Microsoft word</li> </ul>	9		0
Chapter2	Networking & the internet	0	<ul style="list-style-type: none"> <li>Computer network overview</li> <li>-Types of computers network</li> <li>-Network components</li> <li>-Overview on the internet</li> </ul>	6		2

			<ul style="list-style-type: none"> <li>-Web Tools and service on the internet</li> <li>-Purposes of the internet</li> <li>-Browsers</li> <li>-Browser's components</li> <li>-Emai</li> </ul>			
<b>Chapter 3</b>	<ul style="list-style-type: none"> <li>- Health informatics terminologies</li> <li>- Information management</li> <li>- Information system</li> <li>- Information technology</li> <li>- Domains of Health informatics</li> <li>- Information hierarchy</li> <li>- Data</li> <li>- Information</li> <li>- Knowledge</li> <li>- Wisdom</li> </ul>	2		0		0
Chapter4	<ul style="list-style-type: none"> <li>Health Information Systems Overview</li> <li>- Why health information system</li> <li>- Classification of health information system</li> <li>- Health information system reform</li> </ul>	2		0		0
Chapter 5	<ul style="list-style-type: none"> <li>- Routine health information system</li> <li>- Introduction</li> <li>- Information cycle</li> <li>- Data collection</li> </ul>	6	<ul style="list-style-type: none"> <li>- Practice on Microsoft excel</li> <li>- Formula</li> <li>- table</li> <li>- graph</li> </ul>	9	<ul style="list-style-type: none"> <li>- Identify relevant data collection tools in specific</li> </ul>	3

	<ul style="list-style-type: none"> <li>- Data processing</li> <li>- Data presentation</li> <li>- Information utilization</li> <li>- Data quality</li> <li>- Health management information system</li> <li>- HMIS in Ethiopia</li> </ul>		<ul style="list-style-type: none"> <li>- Practice on Microsoft power point</li> </ul>		<ul style="list-style-type: none"> <li>discipline</li> <li>- Analyze secondary data</li> <li>- Present data in the form of tables and graph</li> <li>- Asses data quality</li> </ul>	
Chapter 6	<ul style="list-style-type: none"> <li>Clinical Information System</li> <li>- EMR</li> <li>- Patient Monitoring Systems</li> <li>- CDSS</li> </ul>	4	<ul style="list-style-type: none"> <li>-Demonstration and practice on EM software</li> <li>- Demonstration and practice on CDSS</li> </ul>	1		0
Chapter 7	<ul style="list-style-type: none"> <li>Information retrieval &amp; EBM</li> </ul>	2	<ul style="list-style-type: none"> <li>-Search tools</li> <li>-Search engine</li> <li>-Google</li> <li>-Google scholar</li> <li>-Database</li> <li>-PubMed</li> <li>-Gate way</li> <li>-HINARI</li> <li>-PubMed</li> <li>-Evidence based practice</li> </ul>	12	<ul style="list-style-type: none"> <li>Practical assignment on information retrieval</li> </ul>	3
Chapter 8	<ul style="list-style-type: none"> <li>Information and computer ethics</li> </ul>	2		0		0
	•Total Hour	20		60		8

### **21.31. Clinical Laboratory Attachment III Module Syllabus**

**Module Name: Clinical Laboratory Attachment III**

**Module Code:MeLS-M4443**

**Module EtCTS: 5**

**Program: BSc Medical Laboratory Sciences**

**Year: IV**

**Module duration:**12 weeks

Prerequisites: Basic to Medical Laboratory Science, Applied Genetics and Molecular Biology, Medical Parasitology, Hematology and Immunohematology, Immunology and Serology, Medical Bacteriology and Urine and Body Fluid Analysis, Clinical Chemistry and toxin analysis Histopathology, Medical mycology and (Clin. Lab Attachment I and II)

#### **Module Description:**

The student is assigned to hospital laboratory where he/she collects, transports, prepares and preserves biological specimens; and perform and interpret Microbiological, Parasitological, Hematological, Biochemical, Immunological, Molecular, Urine and Body fluid analysis tests and Histopathological techniques

#### **Module Competency:**

- Prepare working reagents and solutions
- Collect, prepare, preserve and transport biological specimens from patients for diagnostic tests
- Perform and interpret basic tests for molecular biology, Medical Parasitology, Hematology, Immunohematology, Immunology, Serology, Medical Bacteriology, Urine and Body fluid under supervision
- Perform spectrophotometer operation and Wave length selection
- Collect, prepare, transport and preserve clinical chemistry specimens
- Performing clinical chemistry tests.
- Apply safety precaution measures
- Apply quality assurance and safety precaution measures
- Communicate and handle patients properly

## **Learning outcome**

Upon completion of the module, students will be able to:

- Prepare working reagents and solutions
- Collect, prepare, preserve and transport biological specimens from patients for diagnostic tests
- Perform basic molecular biology techniques, Medical Parasitology, Hematology, Immunohematology, Immunology, Serology, Medical Bacteriology, Medical Mycology, Urine and Body fluid
- Interpret basic molecular biology techniques, Medical Parasitology, Hematology, Immunohematology, Immunology, Serology, Medical Bacteriology, Medical Mycology, Urine and Body fluid
- Perform spectrophotometer operation and Wave length selection
- Collect, prepare, transport and preserve clinical chemistry specimens
- Perform clinical chemistry tests
- Communicate and handle patients properly
- Communicate properly with laboratory staff, peers and other health care workers.
- Follow quality assurance procedures

## **Methods of delivery: Hospital Laboratory Attachment.**

### **Assessment:**

- Hospital attachment evaluation: 50% (the attachment objectives and evaluation checklist will be prepared by the respective department)
- Case and seminar presentation: 10% (one group should present a seminar every Friday)
- Practical examination: 40%
- Total: 100%

### **Learning Assessment Methods (both formative and summative)**

- Hospital attachment evaluation: 40% (the attachment objectives and evaluation checklist will be prepared by the respective department)
- Case and seminar presentation: 10% (one group should present a seminar every Friday)
- Practical examination: 40%
- Laboratory report 10%



- Case and seminar presentation: 10% (one group should present a seminar every Friday)
- Practical examination: 40%
- Laboratory report 10%

**References:**

1. Cheesbrough M. District Laboratory Manual for tropical countries. 2000 Vol II
2. Vandepitte J., Verhaegen J. Engbaek K., et al. Basic laboratory procedures in clinical bacteriology. 2nd edition. WHO, Geneva 2003.
3. Manual of basic techniques for a health laboratory 2nd ed, WHO, 2003
4. Mackie Mackartney , Practical Medical microbiology 5th ed.
5. Hoffbrand, AV, Pettit JE. Essential Hematology. 3rd Edition. Blackwell Science.1993.
6. Hematology for medical laboratory technology students, lecture note series; Yared Alemu, 2006.
7. Fischbach F. A Manual of Laboratory and Diagnostic Tests. 4th Edition J.B. Lippincott Co. 1992.
8. Yayehyirad T. and MisganawB. Immunohematology for medical laboratory science students, , Upgraded lecture note.2008
9. Kathy D. Blaney and Paula R. Howard, Basic and applied concepts of Immunohematology, 2nd ed. 2009
10. Christopher D. Hilliyer et al .Blood banking and transfusion medicine: basic principles and practice, 2nd ed.2007
11. Safe blood donations, Module 1 WHO, 2002
12. Robbins. Pathologic basis of disease, 6th edition. 1999
13. Abul K. Abbas, Adrew H. Lichtman. Cellular and molecular immunology, 5th ed. 2003
14. Norber W. Tietez, Fundamental clinical chemistry, USA: W.B. Saunders, 2006
15. Gebeyehu D. Clinical Chemistry principle, procedure and interpretation, 1997.

## **21.32. Advanced and Research Laboratory Attachment module syllabus**

**Module name: Advanced and research laboratory attachment**

**Module Code:MeLS-M4453**

**Module EtCTS: 3**

**Program: BSc Medical Laboratory Sciences**

**Year: IV**

**Module duration:4 weeks (one month)**

**Prerequisites:** All Core Modules

**Module Description:** This module designed to attach the student to national and regional public health laboratories, advanced and Research Institute laboratories (Ethiopian Public Health Institute Laboratories). Students will also be exposed to high standard laboratories to understand the basic work flow in medical laboratory, patient reception, sample collection, registry; test analysis and result communication and documentation systems.

### **Module Competencies**

- Design and conduct problem solving operational and basic research projects
- Use automated equipment and instruments capable of performing a number of tests simultaneously and other sophisticated laboratory equipment
- Interpret, report and document laboratory test results correctly

### **Learning Outcomes:**

To meet the above module objective, the student will be expected to:

- Discuss the principles of advanced laboratory procedures for diagnostic and research purpose
- Recognize available technologies for research in the country
- Demonstrate advanced technologies in the field
- Demonstrate different advanced laboratory techniques
- Properly interpret, report and document advanced laboratory test results

### **Teaching and learning methods**

- Laboratory visit
- Laboratory Demonstration

### **Methods of Assessment Formative**

- Observation

- Demonstration

### **Summative**

- Laboratory report (60%)

- Written exam (40%)

### **Module schedule**

<b>week</b>	<b>Essential contents and learning activities</b>	<b>Hours</b>	<b>Resources</b>
Week 1	Laboratory visit and demonstration	40 hrs.	
Week 2	Laboratory visit and demonstration	40hrs.	
Week 3	Laboratory visit and demonstration	40hrs.	
Week 3	Laboratory visit and demonstration	40hrs.	
Week 4	Laboratory visit and demonstration	3 hrs.	
Week 5	Final exam		

### **21.33. Laboratory Internship module syllabus**

**Module Name: Laboratory Internship module syllabus**

**Module Code: MeLS-M4463**

**Module EtCTS:8**

**Program: BSc in Medical Laboratory Sciences**

**Year: IV**

**Module duration:8 weeks**

**Pre-requisite:** All professional core modules

**Module Description:** This module designed to attach the students to the primary and general hospital laboratories. This professional practice is intensive and comprehensive internship on professional laboratory practice in which students can apply their knowledge, skills and practice in real health care setting.

#### **Module Competencies**

- Perform patient identification proper specimen collection, handling, processing and storage for onsite analysis and sample referral as per standard operating procedure.
- Perform routine and advanced biochemical, microbiological, hematological,

immunologic, molecular and parasitological tests on clinical specimens as per standard operating procedure.

- Interpret, report and document laboratory test results correctly.

### **Learning Outcomes:**

To meet the above module objective, the student will be expected to:

- Integrate knowledge, skills and practice in to the real health care setting.
- Understand the functional units of health care and integration of laboratory to the system.
- Develop good attitude towards working for the benefit of patients.
- Identify the right patient for specimen collection
- Collect and process appropriate laboratory specimens
- Store and refer laboratory specimens according to SOP
- Perform routine and advanced biochemical tests according to SOP
- Perform routine and advanced microbiological tests according to SOP
- Perform routine and advanced hematological tests according to SOP
- Perform routine and advanced immunologic and serological tests according to SOP
- Perform routine and advanced parasitological tests according to SOP
- Detect and identify medically important helminths and protozoa in different clinical specimens.
- Perform routine and advanced molecular tests according to SOP
- Properly interpret, report and document laboratory test results
- Prepare standard operating laboratory tests
- Perform different sterilization and disinfection techniques.
- Understand the preparation, proper storage and quality control of different reagents and staining solutions used in the laboratory

### **Teaching and learning methods**

- Primary and general hospital laboratory attachment

### **Teaching and learning materials**

- Learning guides and checklists, Text books, Reference manual, Standard Operating Procedures, Posters/ Pictures, LCD Projector, White board, marker, Laptop

### **Methods of Assessment**

- Observation & Demonstration using checklists: 40%
- Case Presentation and discussion (every week): 10%
- Oral exam: 15%
- OSPE exam: 15%
- Written exam: 20%

### **21.34. Student Research Project module syllabus**

**Module name: Student Research Project**

**Module Code:MeLS-M4473**

**Module EtCTS: 3**

**Program: BSc in Medical Laboratory Sciences**

**Year: IV**

**Module duration:20 weeks**

**Pre-requisite: Research Methodology**

#### **Module Description:**

- This module is intended to prepare learners to design and conduct operational health research.

#### **Module competencies:**

- Design and conduct problem solving operational and basic research projects.

#### **Learning outcomes**

- Conduct literature review
- Develop research proposal
- Conduct research
- Analyze data and make appropriate interpretation of findings
- Write a scientific research report
- Disseminate research findings

#### **Teaching-Learning Methods**

- Supervised research
- Portfolio

Teaching learning material

- AV aids (LCD and computer, writing board and marker or chalk)
- Computers with data analysis software and internet access

Formative assessment and Summative assessment

- Developing a research protocol (40%)
- Final research report (30%)
- Oral presentation of research finding (30%)

### **References**

1. Makonnen Asefa. Manual for Research Undertaking: the participatory approach, learning bydoing, 2003.
2. GetuDegu and TegbarYigzaw. Research Methodology: Lecture Note for Health Science Students. Ethiopian Public Health Training Initiative.2006.
3. Corlien M. Varkevisser, IndraPathmanathan, and Ann Brownlee. Designing and Conducting Health Systems Research projects: Volume 1 (Proposal Development and Fieldwork) KIT/IDRC.2003
4. Corlien M. Varkevisser, IndraPathmanathan, and Ann Brownlee. Designing and Conducting Health Systems Research projects: Volume 2. KIT/IDRC.2003
5. HenrykDancygier: Clinical epidemiology. How to do clinical practice research
6. Margaret L. Brandeau: Operations research and health care. Handbook of methods and applications
7. Nigel Bruce, Danniell Pope and Debbi Stanistreet: Quantitative methods for health research. A practical interactive guide to epidemiology and statistics
8. Ann Bowling: Research methods in health. Investigating health and health service.

## Module Schedule

Week	Content	Time
Week 1-8	Data collection	
Week 9-10	Data collection	
Week 11-12	Analysis and interpretation	
Week 13-16	Write-up	
Week 17-18	Preparation for oral presentation	
Week 19	Oral presentation	
Week 20	Submission corrected thesis	

### 21.35. Team Training Program (TTP) module syllabus

**Module name:** Team Training Program (TTP)

**Module Code:** ComH-M4482

**Module EtCTS:** 7

**Program:** BSc Medical Laboratory Sciences

**Year:** IV

**Module Duration:**8 Weeks

**Pre-requisite:** all core modules and SPH modules

**Module Description:** This module intended to provide medical laboratory students experiential learning opportunities while providing primary health care services by teaming up with other health professionals. This supervised practice covers both clinical and public health tasks.

#### **Module competencies**

- Advocate proper use of laboratory tests.
- Demonstrate effective verbal and written communication with client and clients ‘family.
- Work in harmony with the health care workforce and stakeholders.
- Provide health Information to communities and clients.
- Design and apply appropriate intervention for psychological, social, and environmental determinants of health

- Perform patient identification proper specimen collection, handling, processing and storage for onsite analysis and sample referral as per standard operating procedure.
- Perform routine and advanced biochemical, microbiological, hematological, immunologic, molecular and parasitological tests on clinical specimens as per standard operating procedure.
- Interpret report and document laboratory test results correctly.

### **Learning outcome**

- Diagnose and manage patients at the primary health care unit level in an ethical and efficient manner
- Perform and interpret basic laboratory tests
- Identify priority community health problems and hazards and their determinants.
- Design and implement effective and feasible health promotion and disease prevention interventions
- Design and implement health education sessions on priority health issues
- Interact with other healthcare professionals through effective team work
- Lead and manage healthcare team and health services at PHCU level
- Mobilize community partnerships and action to identify and solve community health problems
- Evaluate effectiveness, efficiency, accessibility, equitability, and quality of health services
- Communicate effectively with individuals, families, communities, PHCU staff, local health department staff, peers and faculty
- Interact with individuals and families with sensitivity to personal and cultural factors
- Advise individuals and families to promote health and prevent illness
- Demonstrate key public health values, attitudes and behaviors such as commitment to equity and social justice, recognition of the importance of the health of the community as well as the individual, and respect for diversity, self-determination, empowerment, and community participation
- Show respect for peers and other healthcare students and professionals and the ability to foster a positive collaborative relationship with them
- Analyze community practice experience and perform practice-based improvement activities using a systematic methodology
- Use information technology to manage information, access online medical information, and



support one's own education

- Demonstrate a habit of self-reflection, responsiveness to feedback and an on-going development of new skills, knowledge and attitude
- Search, collect, organize and interpret health and health-related information from different sources
- Use information and communication technology to assist in health promotion and disease prevention measures for individuals and families

### **Teaching-Learning Methods**

- Community survey, Mini-project, Supervised clinical practice
- Supervised community practice, Portfolio

### **Teaching-Learning Materials**

1. Dan L Long (et al.) Harrison's principles of medicine. 18th edition.2012
2. Goldman. Cecil Medicine. 23rd edition. 2007
3. Eddleston, Michael; Davidson, Robert; Brent, Andrew; Wilkinson, Robert. Oxford Handbook of Tropical Medicine, 3rd Edition. 2008
4. Jira C, Feleke A, Mitike G. Health services management for health science students. Carter Center;2003.
5. Berhane Y, Haile Mariam D, Kloos H. The epidemiology and ecology of health and disease in Ethiopia. Addis Ababa; Shama Books, 2006.
6. Rothman. Modern epidemiology
7. Daniel: Biostatistics: A foundation for analysis in health sciences.
8. Pagano: Principles of Biostatistics
9. Management Sciences for Health (MSH). Managers who lead. MSH,2005.
10. Walt G, Vaughan P. An Introduction to the Primary Health Care Approach in Developing Countries: AReview with Selected Annotated References.
11. Carl Fertman and Diane Allensworth. Health promotion programs: from theory to practice.2010
12. Lawrence Green, Marshall Kreuter. Health program planning: an educational and ecological approach. Volumes 1-2.2005
13. Jackie Green,Keith Tones. Health promotion: planning and strategies.2010
14. Mark Edberg. Essentials of health behavior: social and behavioral theory in public health.

- 15. Robert H Friis. Essentials of environmental health (2nd edition). The essential public health series.2012.
- 16. Kathryn Hilgenkamp. Environmental Health: Ecological Perspectives.2006
- 17. Herman Koren and Michael Bisesi. Handbook of environmental health.2002.

**Teaching and learning material and recourses**

- o AV aids (LCD and computer or Overhead projector and transparencies, writing board and marker or chalk)
- o Computers with internet and data analysis software
- o Logbooks for entry of community experience
- o Stationeries for community survey
- o Drugs, equipment, tools and materials for clinical and public health interventions

**Assessment Methods**

- o Logbook and portfolio
- o Continuous supervision TTP
- o Weekly activity report and Seminar

**Summative assessment**

- o Action plan (20%)
- o Case scenario (20%)
- o Fourteen-night report (15%)
- o Community diagnosis (15%)
- o Mini-project (15%)
- o Final activity report (15%)

**Sample Attachment Schedule**

<b>Week</b>	<b>Activity</b>
<b>Week 1</b>	Discussion with local administration, health office, PHCU staff and community representatives about attachment objectives and roles and responsibilities of all parties Community diagnosis: survey, analysis of results, action plan and presentation and Discussion
<b>Week 2-7</b>	Plan and implement PHCU and local health office activities in coordination with them

	Clinical service at OPD, clinic, wards and outreach sites throughout the week including duty public health interventions: Health education, school health, prison health, EPI, epidemic investigation and management, primary health care evaluation including clinical services, environmental health activities (inspection of water sources, food hygiene in public restaurants, public sanitation facilities, waste disposal, health facilities supervision, workplace safety), mini-project to solve priority community health problem home visit on Fridays for half day Weekly activity report and seminar on Friday afternoons
<b>Week 8</b>	Evaluate effectiveness and efficiency of the service rendered and the community learning Experience Overall reporting and discussion

**NB.**

- Depending on the number of students and size of facilities, 1-2students will be assigned for duty at the laboratory during evening hours and in the weekends.
- Seminar topics will be selected through discussion between students and faculty based on national and local relevance
- Outreach and public health interventions will be coordinated with plansof the district and PHCUs.

### **21.36. Comprehensive Examination module syllabus**

**Module name: Comprehensive Examination**

**Module code: MeLS-M4493**

**Module EtCTS: P/F**

**Program: BSc Medical Laboratory Sciences**

**Year: IV**

**Module duration: 2 weeks**

**Module pre-requisite:** All modules

**Module description:** this module intends to evaluate the skill, knowledge and attitude of graduating BSc Medical Laboratory Science students. This module includes both external and internal examination.

**Module competency:**

- Satisfy all competencies listed under all core modules in this program

**Assessment**

- Internal: written examination: 60%

- External: oral examination: 40%

**Examiners: 6 external examiners are required.**

1. Medical Microbiology
2. Medical Parasitology
3. Immunology and Molecular Biology
4. Hematology and Immunoematology
5. Clinical Chemistry
6. Quality Assurance, Laboratory and Supply Chain Management

**Facilitators: 3 facilitators**



# **WALIIF HEALTH SCIENCES AND BUSINESS COLLEGE**

**Harar Campus**

**Bachelor of Pharmacy (BPharm) Curriculum for  
Waliif Health Science and Business College,  
Pharmacy Department**

November, 2022

Harar, Ethiopia

## **1. Background**

Ethiopia is a country characterized by low socio economic status and health service coverage. As a result, there is low ratio and improper mix of health professional to the population. The current Ethiopian health policy is based on health promotion and disease prevention by giving priority to the rural and unprivileged urban population. Successful implementation of this policy is highly dependent on availability of well-trained health professionals, both in quality and quantity. Education is a mainstay for development and alleviation of rampant problems of a given nation. It can offer opportunities to the citizens of a country to play a pivotal role in bringing and sustaining the required development in various sectors in which the health delivery system is not an exception. The pharmacy service as an essential component of the health care delivery system requires properly trained professionals.

While pharmacists' vital role remains to be dispensing of medications and devices and ensuring appropriate therapy and outcomes, they also work in the areas of health promotion and disease prevention, pharmaceutical production and health systems management. In this regard, pharmacists provide their services in a variety of settings in response to a dynamic and evolving set of primarily local health care priorities and needs. There are also regional, national and international policies and factors, which dictate the need for developments in pharmacy practice. Within this context, pharmacists are medication experts in the treatment of disease and in health promotion. This expertise, in its broadest sense, encompasses the preparation, supply and control of medicinal products and assurance of desired outcomes of treatment by medication. It thus begins with the medicine development process and continues through to medication's ultimate benefit to the individual and to society generally. This expertise has its foundations in the pharmaceutical sciences and related research, and has its focus on the individual and populations.

The needs of modern health care systems require that the role of the pharmacist develop rapidly to meet its demands. It is also expected that pharmacists' roles may evolve with time, changes in societal needs and technological progress. Thus, the pharmacy curriculum should change with such developments in order to address the needs of the society. Generally, the pre-service education is designed to ensure that the newly qualified pharmacist has the necessary knowledge and skills to commence practicing competently in a variety of settings including community and hospital pharmacy and the pharmaceutical industry. As such, the curriculum

used in pre-service education needs to be responsive to changes in the practice setting, the needs of the society and knowledge and technological innovations. That is why a robust evaluation of the current performance of the curriculum and a constant formative evaluation of progresses in the field of pharmacy are highly recommended. In line with such recommendations, this curriculum document was prepared after a comprehensive assessment of the performance of the previous curriculum and needs for revision.

## **2. Rationale**

The global landscape of pharmacy practice and thus the education of pharmacists have evolved significantly in the past three decades. The main driver of such changes has been the advent of patient-centered pharmaceutical care as a philosophy of pharmacy practice. As such, higher institutions in Ethiopia have been incorporated more clinical courses in the existing pharmacy curriculum throughout the past decade. This clinical oriented curriculum with significantly higher number of clinical-leaning courses started in 2008. In this endeavour the higher education have tried very hard to maintain a balance between the clinical and non-clinical course contents in a way that reflects the Ethiopian context. There was a move to modularize the curriculum. This was done by clustering courses into general umbrellas of modules, without the significant modification of course contents in the previous curriculum.

In general the Ministry of Education has prescribed certain common courses to be included in all undergraduate curriculums as per the national Educational roadmap spanning from 2020 to 2030. Accordingly, the waliif Health Science and Business College has also incorporated the freshman courses in the first semester and other mobile courses to be offered until year-IV. Waliif Health Science and Business College adopted this new curriculum as it was recently revised based on nationwide assessment of the performance of the current curriculum by including all stakeholders from students, instructors and employees. Thus, the preparation of this curriculum was initiated in a bid to respond to the demand arising from different stakeholders.

### **3. Objectives**

#### **General Objectives:**

The general objective of the B.Pharm Program is to train highly qualified pharmacists who fulfil the essential, minimum common expectations of health care systems worldwide while fulfilling local needs.

#### **Specific Objectives:**

- To train manpower that is more patient-oriented while still having a broad pharmaceutical knowledge to be able to easily adapt to working in any of the settings in the country's pharmaceutical sector.
- To provide practice-based training so that future pharmacists acquire problem-solving skills.
- To facilitate and assist in the transfer and adaptation of pharmaceutical knowledge

#### **Demand for the program**

In Ethiopia, health institutions (hospitals, health centers, NGOs, and others), higher institutions (government and private), research institutions and pharmaceutical industries that require competent pharmacy professionals at different level of training and expertise are progressively growing. As a result, ample opportunities are created for pharmacy practitioners to play a vital role in the country's development. However, the input of these professionals to a great extent depends on the quality of education (training) they receive in the higher learning institutions.



## Professional Profile

To be effective health care team members, pharmacists need skills and attitudes enabling them to assume many different functions. The concept of the “seven-star pharmacist” was introduced by WHO and taken up by International Pharmaceutical Federation (FIP) in 2000 in its policy statement on Good Pharmacy Education Practice to cover these roles: caregiver, decision-maker, communicator, manager, life-long learner, teacher and leader. The function of the pharmacist as a researcher was later on added.

These roles of the pharmacist are described below and include the following functions:

- **Caregiver:** Pharmacists provide caring services. They must view their practice as integrated and continuous with those of the health care system and other health professionals. Services must be of the highest quality.
- **Decision-maker:** The appropriate, efficacious, safe and cost-effective use of resources (e.g., personnel, medicines, chemicals, equipment, procedures, and practices) should be the foundation of the pharmacist’s work. At the local and national levels, pharmacists play a role in setting medicines policy. Achieving this goal requires the ability to evaluate, synthesize data and information and decide upon the most appropriate course of action.
- **Communicator:** The pharmacist is in an ideal position to provide a link between prescriber and patient, and to communicate information on health and medicines to the public. He or she must be knowledgeable and confident while interacting with other health professionals and the public. Communication involves verbal, non-verbal, listening and writing skills.
- **Manager:** Pharmacists must be able to manage resources (human, physical and financial) and information effectively; they must also be comfortable being managed by others, whether by an employer or the manager/leader of a health care team. More and more, information and its related technology will provide challenges as pharmacists assume greater responsibility for sharing information about medicines and related products and ensuring their quality.
- **Life-long-learner:** It is impossible to acquire in pharmacy school all the knowledge and experience needed to pursue a life-long career as a pharmacist. The concepts, principles and commitment to life-long learning must begin while attending pharmacy school and

must be supported throughout the pharmacist's career. Pharmacists should learn how to keep their knowledge and skills up to date.

- **Teacher:** The pharmacist has a responsibility to assist with the education and training of future generations of pharmacists and the public. Participating as a teacher not only imparts knowledge to others, it offers an opportunity for the practitioner to gain new knowledge and to fine-tune existing skills.
- **Leader:** In multidisciplinary (e.g., team) caring situations or in areas where other health care providers are in short supply or non-existent the pharmacist is obligated to assume a leadership position in the overall welfare of the patient and the community. Leadership involves compassion and empathy as well as vision and the ability to make decisions, communicate, and manage effectively. A pharmacist whose leadership role is to be recognized must have vision and the ability to lead.
- **Researcher:** The pharmacist must be able to use the evidence base (e.g., scientific, pharmacy practice, health system) effectively in order to advice on the rational use of medicines in the health care team. By sharing and documenting experiences, the pharmacist can also contribute to the evidence base with the goal of optimizing patient care and outcomes. As a researcher, the pharmacist is able to increase the accessibility of unbiased health and medicines-related information to the public and other health care professionals

#### **4. Graduate Profile**

It is envisaged that pharmacy graduates with the B.Pharm. Degree will be capable to assume the following responsibilities and attributes:

##### **Core graduate competencies**

- Organize and control the manufacturing, compounding and packaging of pharmaceutical products;
- Organize the selection, procurement, storage, and distribution of pharmaceutical materials and products;
- Provide Pharmaceutical Care and Dispense and ensure the optimal use of medicines by the patient;
- Provide pharmacist-initiated care to patients and ensure the optimal use of medicines;

- Provide education and information on health care and medicines;
- Promote community health and provide related information and advice
- Conduct research to ensure the optimal use of medicines.
- Demonstrate a high level of professional ethics in order to satisfy the pharmaceutical needs of the society.
- Maintain and expand knowledge through self-directed learning.
- Be able to work as a member of the health team.
- Possess the necessary background to pursue further advanced study in the pharmaceutical sciences.

The core competencies have the following knowledge, attitude and skill attitude components in the various domains of pharmacy practice.

<b>Domains</b>	<b>Competencies</b>
Patient care	Knowledge:
	<ul style="list-style-type: none"> <li>• Possess the necessary background to pursue further advanced study in the pharmaceutical sciences</li> <li>• Provide pharmacist-initiated care to patients and ensure the optimal use of medicines</li> <li>• Provide education and information on health care and medicines</li> </ul>
	Attitude:
	<ul style="list-style-type: none"> <li>• Advocate the proper use of necessary materials by screening</li> <li>• Recognize, adhere to and promote established safety rules</li> <li>• Respectful and compassionate to patients, their relatives and other professionals</li> <li>• Be able to work as a member of the health team</li> </ul>
	Skill:
<ul style="list-style-type: none"> <li>• Provide Pharmaceutical Care and Dispense and ensure the optimal use of medicines by the patient</li> <li>• Communicate effectively both verbally and in writing</li> </ul>	

	<ul style="list-style-type: none"> <li>• Collect, document, retrieve and interpret data related to all their activities clearly and safely</li> </ul>
Pharmaceutical technology	Knowledge:
	<ul style="list-style-type: none"> <li>• Possess the necessary background to pursue further advanced study in the pharmaceutical sciences</li> </ul>
	Attitude:
	<ul style="list-style-type: none"> <li>• Advocate the proper use of necessary materials by screening</li> <li>• Recognize, adhere to and promote established safety rules</li> <li>• Institute and promote safety, quality control and quality assurance in their allowed work area</li> </ul>
	Skill:
	<ul style="list-style-type: none"> <li>• Organize and control the manufacturing, compounding and packaging of pharmaceutical products</li> <li>• Monitor and maintain proper functioning of necessary equipment/reagents</li> <li>• Develop and modify laboratory procedures</li> </ul>
Health promotion	Knowledge:
	<ul style="list-style-type: none"> <li>• Provide education and information on health care and medicines</li> <li>• Promote community health and provide related information and advice</li> </ul>
	Attitude:
	<ul style="list-style-type: none"> <li>• Advocate the proper use of necessary materials by screening</li> </ul>
	Skill:
	<ul style="list-style-type: none"> <li>• Prepare educational materials to promote the rational use of medicines and medical devices</li> <li>• Screen for drug abuse and refer patients to appropriate care centre</li> </ul>
Professionalism	Knowledge:

	<ul style="list-style-type: none"> <li>• Demonstrate a high level of professional ethics in order to satisfy the pharmaceutical needs of the society</li> <li>• Maintain and expand knowledge through self-directed learning</li> </ul>
	Attitude:
	<ul style="list-style-type: none"> <li>• Maintain the pharmacy ethical code of conduct standards</li> <li>• Contribute to stewardship of their profession</li> <li>• Recognize, adhere to and promote established safety rules</li> <li>• Pursue graduate training in pharmacy and other health related disciplines</li> <li>• Participate in policy, professional standards, continuing professional development issues pertaining to pharmacy profession</li> <li>• Respectful and compassionate to patients, their relatives and other professionals</li> </ul>
	Skill:
	<ul style="list-style-type: none"> <li>• Communicate effectively both verbally and in writing</li> <li>• Engage in policy, professional standards, and continuing professional development issues pertaining to pharmacy profession</li> </ul>
Pharmacy law and regulatory affairs	Knowledge:
	<ul style="list-style-type: none"> <li>• Familiarity with the latest laws, directives and guidelines governing the pharmaceutical sector</li> </ul>
	Attitude:
	<ul style="list-style-type: none"> <li>• Maintain the pharmacy ethical code of conduct standards</li> <li>• Recognize, adhere to and promote established safety rules</li> </ul>
	Skill:
	<ul style="list-style-type: none"> <li>• Store and use laboratory supplies and dispose expired drugs safely according to the rules and regulations</li> <li>• Develop and modify laboratory procedures</li> </ul>
	Knowledge:

Leadership and management	<ul style="list-style-type: none"> <li>• Use his/her critical thinking to improve the pharmacy working environment</li> <li>• Familiarize him/her with latest scientific findings to improve the quality of services rendered to the society</li> </ul>
	Attitude:
	<ul style="list-style-type: none"> <li>• Institute and promote safety, quality control and quality assurance in their allowed work area</li> <li>• Participate in policy, professional standards, continuing professional development issues pertaining to pharmacy profession</li> </ul>
	Skill:
	<ul style="list-style-type: none"> <li>• Organize the selection, procurement, storage, and distribution of pharmaceutical materials and products</li> <li>• Plan drugs and equipment logistic procurement, evaluation, setup and auditing</li> <li>• Monitor the inventory in storage, work and laboratory area</li> <li>• Provide professional services, leadership and quality assurance in work areas</li> <li>• Demonstrate leadership and management skills</li> </ul>
Scholar (Research and Evidence Based Practice)	Knowledge:
	<ul style="list-style-type: none"> <li>• Familiarize him/her with latest scientific findings to improve the quality of services rendered to the society</li> <li>• Maintain and expand knowledge through self-directed learning</li> <li>• Participate in research to ensure the optimal use of medicines</li> </ul>
	Attitude:
	<ul style="list-style-type: none"> <li>• Pursue graduate training in pharmacy and other health related disciplines</li> </ul>
	Skill:
<ul style="list-style-type: none"> <li>• Participate and/or conduct research and development of new drugs discovery technologies</li> </ul>	

	<ul style="list-style-type: none"><li>• Develop and modify laboratory procedures</li></ul>
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## **5. Admission Requirements**

### **Regular Program**

Admission requirements will be as per the College Senate Legislation

The College shall admit for undergraduate studies:

- Students who have completed grade 12<sup>th</sup> and satisfy in its entrance examination results to join the Ethiopian higher institutions/private institutions.
- Applicants with foreign high school education of equivalent level to the Ethiopian high school education, as determined by the Ministry of Education, and who satisfy entrance requirements
- Considering the extensive practical attachments of the program, students with major disabilities (vision, mobility and hearing-related problems or those who cannot effectively use both hands) shall not be admitted
- Requests for transfer from other departments/disciplines shall be handled based on the relevant college senate legislation

### **Special Admission**

Special admissions may be granted to attract potentially resourceful candidates such as mature students. Such special admissions shall be decided based on relevant College specific legislations and guidelines in line with the National direction.

- The student who has completed a minimum of one academic year of study in good academic standing in an Ethiopian institution of higher education or in a foreign institution recognized by the Ministry of Education or has a diploma in the same or related field if applying for admission into a degree program from an institution of higher learning may also be admitted based on the College Senate legislation.



## **6. Duration of the Program**

- The bachelor degree in pharmacy requires 5 years or 10 semesters out of which the last 2 semesters (Year V) are dedicated to clerkships and community-based team training program.
- The curriculum contains 32 modules with a total of 351 ECTS. The total ECTS is excluding two non-credited courses.

## **7. Teaching Methodology**

### **Mode of delivery**

To cover all the modules, the program uses a mixed mode of delivery (block and Parallel).

### **Method of teaching**

The following methods will be used as strategies to teach the courses within the different modules in the program:

- Lectures
- Laboratory practices
- Demonstrations
- Group works
- Home study
- Seminars
- Tutorials
- Home take assignments
- Skill lab
- Hospital attachment
- Health center attachment
- Pharmaceutical industries attachments
- Community based learning
- Field supervision

- Team training program
- Research project
- Role play
- Symposium
- Talk show
- Drama etc.

## **8. Assessment**

Evaluation will be in the form of formative and summative assessment

- Formative assessment consists of,
  - Continuous assessment (test, quiz, case presentation, assignment /individual –group exercise)
  - Bed side, round
  - Supervision
  - Log book
  - Portfolio
  - Assessment of practical skills
- Summative assessment consists of:
  - Final written exam
  - Objective Structured Clinical Examination (OSCE)
  - Oral exam
  - Exit exam

N.B:

- Grading for exit exam will be P/F, and the student should score greater than or equal to 50% to pass.

## **Grading System**

The program uses criteria referenced method of evaluation to value the performance of students at the end of each semester and/or year. The instructor uses the scale fixed and grade based on the pre-settled criteria, which are driven from the learning objectives of the topic/course. Thus, we do not use norm-referenced method.

Accordingly, students will be graded on the letter grade as well as on percentage grading system. The grading subsystem has to be adjusted to calculate the GPA based on the fixed scale range shown in the following table. In addition, the following table provides guidance on the raw marks and their corresponding fixed number and letter grades.

The grading of the comprehensive exit exam and the physical fitness courses will be on a “Pass” or “Fail” basis.

Raw Mark Interval [100%]	Corresponding fixed number Grade	Corresponding Letter Grade
[90, 100]	4.00	A+
[85, 90)	4.00	A
[80, 85)	3.75	A-
[75, 80)	3.50	B+
[70, 75)	3.00	B
[65, 70)	2.75	B-
[60, 65)	2.50	C+
[50, 60)	2.00	C
[45, 50)	1.75	C-
[40, 45)	1.00	D
< 40	0.00	F

## Promotion criteria

- A student who scored “F” grade on a pre-requisite course shall not be allowed to take the next course.
- A student who scored “C-“ and/or “D” in one or two major professional courses can be allowed to take remedial exam once. The student shall repeat the course/s if he/she could not score “C” or above on the remedial exam.
- A student who scored “C-” or below in three or more major professional courses shall not be promoted to the next semester, irrespective of his/her cGPA. However, a student who scored “C-” in only three major professional courses can be allowed to take remedial exam for one of the courses and can be promoted if he/she scored a minimum grade of “C” in the remedial exam.
- Irrespective of his/her cGPA, a student is expected to score a minimum of “C” grade on all major professional courses to be eligible for the final year clerkship attachment.

## 9. Graduation Requirement

Graduation requirement will be according to the rules and regulations of the College. Moreover, the following requirements must be fulfilled for a student enrolled in the B.Pharm program to be eligible for graduation:

- Has taken all the required modules for the program
- Obtained a minimum cGPA of 2.00
- Has not scored ' F ' grade in any course,
- Has not scored less than 'C' grade in any of the major professional courses (course code starting with 'Phar...')
- Has not scored 'D' or lesser on any of the supportive courses/modules
- Has successfully completed and passed clerkship/professional practice program
- Has carried out a student research project on a selected and agreed topic of research problem and scored a minimum of ' C ' grade
- Has passed a written comprehensive exit examination to be set for the program. After completion of all deductive courses, research and clerkships in good academic standing, students must take the comprehensive exit exam and score

50% or higher to be eligible for graduation. The exit exam shall be graded as Pass/Fail and a pass mark is considered as a prerequisite to sit for the national licensure exam.

- A student who fails to score a passing mark (50%) in the first comprehensive exit exam will be allowed to re-sit for the next exam after 3 months preparation with an appropriate academic support.

**Attendance:** Students should attend 100% of both lecture classes and practical attachments. The case of students who fail such requirements will be entertained as per senate legislation of the college and preceptor manual of the respective department.

## 10. Degree Nomenclature

- Up on successful completion of this program the graduate will be awarded “The Degree of Bachelor of Pharmacy (B.Pharm)” in English and “የባዥ ስር ዲግሪ ባህ-ርግሰ.” in Amharic.

## 11. Quality Assurance

The department quality assurance committee is responsible for the management and monitoring of the program. Both formative and summative evaluations will be done to assess the realization of the curriculum’s objectives. The following mechanisms will be employed to evaluate whether or not the courses offered in the program meet the standards:

- A course syllabus according to the course content indicated in this curriculum should be prepared for each course with time frame.
- The departments will evaluate the agreement between examination contents and the course syllabi.
- Recruitment of qualified staff
- Examination and continuous assessment (formative and summative)
- Periodic acquisition of up – to – date references, laboratory equipment and reagents
- Supervised practices in the training health facilities

- Periodic evaluation of the curriculum and the program in general
- Periodic evaluation and revision of the curriculum based on the feedback from stakeholders/employers, graduates and students.

## **12. Module and course code assignment and List of Modules/Courses**

### **12.1. Module and course code assignment**

#### **In the module coding:**

- The alphabets indicate to which program/department the module belongs
- The numbers should be four digits and
- The first number indicates year of study (starting from 1- for 1<sup>st</sup> year, 2- for 2<sup>nd</sup> year, etc.)
- The 2<sup>nd</sup> and 3<sup>rd</sup> numbers indicate module number (a two digit code starting from 01, 02...etc.)
- The last number indicates module category (core=1, elective=2, basic=3, general=4)

#### **In the course coding:**

- The alphabets indicate the course hosting department/program
- The numbers should be four digits
- The first number indicates year of study (starting from 1- for 1<sup>st</sup> year, 2- for 2<sup>nd</sup> year, etc.)
- The 2<sup>nd</sup> and 3<sup>rd</sup> numbers indicate module number (a two digit code starting from 01, 02...etc.)
- The last number indicates the course number (starting from 1, 2...etc.) within the module

## 12.2 List of Modules/Courses

- Except for Year I, Semester I, each semester shall be 20 weeks for the effective implementation of the curriculum.

The following tables show the list of modules and courses.

### Major Compulsory (227 ECTS)

Module Number	Module Category	Module title			Module code	Course Code	Course Title	Course ECTS	Pre-requisite/ Co-requisite
7	Core	Introductory Pharmacy Module			Phar-M2071	Phar 2071	Introduction to pharmacy	2	None
						Phar2072	Pharmaceutical calculations	2	None
8	Core	Pharmacognosy and Alternative Medicine I			Phar-M2081	Phar2081	Chemistry of Natural products	5	Organic Chemistry, Organic Chemistry Laboratory
						Phar2082	Pharmacognosy	7	Chemistry of Natural Products
9	Core	Dosage form Sciences I			Phar-M2091	Phar2091	Integrated physical pharmacy and pharmaceutics-I	7	Pharmaceutical Calculations
					Phar-M2091	Phar2092	Practical Integrated physical pharmacy and pharmaceutics-I	2	Pharmaceutical Calculations & Integrated Physical Pharmacy and Pharmaceutics I
10	Core	Pharmacology module I			Phar-M2101	Phar2101	Pharmacology-I	7	Biochemistry I and II Physiology I and II Human Anatomy
11	Core	Medicinal Chemistry module I			Phar-M2111	Phar2111	Medicinal chemistry-I	7	Organic Chemistry/ Pharmacology I
12	Core	Dosage form Sciences II			Phar-M3121	Phar3121	Integrated physical pharmacy and pharmaceutics-II	7	Integrated Physical Pharmacy and Pharmaceutics I
						Phar3122	Practical Integrated physical pharmacy and pharmaceutics-II	2	Integrated Physical Pharmacy and Pharmaceutics II
13	Core	Pharmacology module II			Phar-M3131	Phar3131	Pharmacology II	7	Pharmacology I
						Phar 3132	Clinical toxicology	3	Pharmacology I and II

14	Core	Medicinal Chemistry module II			Phar-M3141	Phar3141	Medicinal chemistry-II	5	Medicinal Chemistry I Pharmacology II
15	Core	Pharmaceutical Analysis			Phar-M3151	Phar3151	Pharmaceutical analysis-I	7	None
						Phar3152	Pharmaceutical analysis-II	7	Pharmaceutical Analysis I
16	Core	Pharmacotherapeutics Module I			Phar-M3161	Phar3162	Integrated therapeutics-I	7	Pharmacology I
						Intm 3161	Physical assessment	2	Integrated Therapeutics I
						Phar3163	Integrated therapeutics-II	7	Integrated Therapeutics I
17	Core	Pharmaceutical Technology I			Phar-M3171	Phar3171	Immunological and biological products	3	Integrated Physical Pharmacy and Pharmaceutics I and II
18	Core	Social and administrative pharmacy module I			Phar-M3181	Comh3181	Health service management and policies	5	None
19	Core	Biopharmaceutics and Clinical Pharmacokinetics			Phar-M3191	Phar3191	Biopharmaceutics and Clinical Pharmacokinetics	7	Physiology II and Pharmacology II
20	Core	Pharmaceutical Technology II			Phar-M4201	Phar4201	Industrial pharmacy	7	Integrated Physical Pharmacy and Pharmaceutics I and II
21	Core	Social and administrative pharmacy module II			Phar-M4211	Phar4211	Introduction to Pharmacoeconomics	3	None
						Phar4212	Pharmaceutical Supply Chain management	7	Health Service Management and Policies (ComH3181)
						Phar4213	Medical supplies, equipment and reagents	3	None
						Phar4214	Pharmaceutical Marketing and promotion	3	None
22	Core	Pharmacotherapeutics Module II			Phar-M4221	Phar4221	Integrated therapeutics-III	7	Integrated Therapeutics I
						Phar4222	Integrated therapeutics-IV	7	Integrated Therapeutics I
23	Core	Pharmacognosy and Alternative Medicine II			Phar-M4231	Phar4231	Complementary and alternative medicine	3	Pharmacognosy



24	Core	Pharmacy practice module			Phar-M4241	Phar4241	Drug informatics	3	None
						Phar4242	Communication skills for pharmacists	3	None
						Phar4243	Pharmacy law and ethics	3	None
						Phar4244	Pharmacy practice	7	None
						Nurs4245	First aid	3	Course on Anatomy and Physiology
						Com-H4246	Nutrition	3	None
26	Core	Pharmaceutical Research I			Phar-M4261	Phar4261	Research Methods	3	Epidemiology and biostatistics courses
27	Core	Pharmacy clerkship I			Phar-M5271	Phar5271	Ambulatory care clerkship	5	Successful completion of all course work
						Phar5272	Drug information service clerkship	3	Successful completion of all course work
						Phar5273	Internal medicine clerkship	7	Successful completion of all course work
						Phar5274	Hospital pharmacy clerkship	7	Successful completion of all course work
28	Core	Pharmacy clerkship II			Phar-M5281	Phar5281	Pediatric clerkship	7	Successful completion of all course work
						Phar5282	Gynecology, obstetrics and family planning clerkship	3	Successful completion of all course work
						Phar5283	Pharmaceutical Manufacturing clerkship	5	Successful completion of all course work
						Phar5284	Community pharmacy clerkship	5	Successful completion of all course work
30	Core	Pharmaceutical Research II			Phar-M5301	Phar5301	Directed study	5	Research methods

31	Core	Team Training Program			Com-HM5311	ComH5311	Team training program	7	Successful completion of all course work
32	Core	Comprehensive Exit Exam			Phar-M5321		Comprehensive exit exam	0	Successful completion of all course work and clerkship

### Major Elective (10 ECTS)

Module Number	Module Category	Module title	Module code	Course Code	Course Title	Course ECTS	Pre-requisite/ Co-requisite
25	Elective	Professional elective module	Phar-M4252	Phar4251	Introduction to Pharmacoepidemiology	5	None
				Phar4252	Phytochemistry	5	-
				Phar4253	Pharmaceutical Manufacturing	5	Pharmaceutical Technology Module
				Phar4254	Pharmacogenetics	5	Pharmacology I and II
				Phar4255	Pharmaceutical Quality control and quality assurance	5	Pharmaceutical Analysis I & II
				Phar4256	Drug design and synthesis	5	Organic Chemistry, Medicinal Chemistry I and II
				Phar4257	Warehouse management	5	Pharmaceutical supply chain management
				Phar4258	Research in pharmacology	5	Pharmacology I and II, Clinical toxicology
29	Elective	Professional elective clerkship	Phar-M5292	Phar5291	Psychiatry clerkship	5	Successful completion of all course work
				Phar5292	Surgery clerkship	5	Successful completion of all course work
				Phar5293	Oncology & Hematology clerkship	5	Successful completion of all course work
				Phar5294	Ophthalmology & ENT clerkship	5	Successful completion of all course work
				Phar5295	Emergency Medicine Clerkship	5	Successful completion of all course work
				Phar5296	Dermatology clerkship	5	Successful completion of all course work
				Phar5297	Pharmaceutical quality control	5	Successful completion of all course work
				Phar5298	Pharmaceutical regulatory affairs	5	Successful completion of all course work
				Phar5299	Pharmaceutical wholesale & promotion	5	Successful completion of all course work

### Supportive (52ECTS)

Module Number	Module Category	Module title	Module code	Course Code	Course Title	Course ECTS	Pre-requisite/ Co-requisite
3	Basic	Biomedical sciences-I	Biom-M1033	Anat1031	Human Anatomy and Histology	7	None
				Phyl1032	Human Physiology-I	5	None
4	Basic	Chemistry	Chem-M1043	Chem1041	Organic chemistry	5	None
				Chem1042	Organic chemistry laboratory	2	None
5	Basic	Biomedical sciences-II	Biom-M2053	Path2054	Pathology	5	Physiology I&II , Biochemistry I&II
				Phyl2055	Human Physiology-II	5	Human Physiology I
				Bioc2051	Biochemistry-I	5	Organic Chemistry
				Bioc2052	Biochemistry-II	5	Organic Chemistry
6	Basic	Biostatistics and Epidemiology	Com-H2063	ComH2061	Biostatistics	3	None
				ComH2062	Epidemiology	3	None

### General Education (62 ECTS)

Module Number	Module Category	Module title	Module code	Course Code	Course Title	Course ECTS	Pre-requisite/ Co-requisite
1	General	English Language Skills	Enla-M1014	FLEn1011	Communicative English Skill I	5	None
				FLEn1012	Communicative English Skill II	5	None
1	General	Social sciences and humanities	Sshm-M1014	Psch 1011	General Psychology	5	None
				LoCT 1011	Critical Thinking	5	None
				GeES1011	Geography of Ethiopia & the Horn	5	None
				Anth 1012	Social Anthropology	5	None
1	General			Math 1011	Math for Natural Sciences	5	None
1	General			Phyc-1011	General Physics	5	None
1	General			SpSc 1011	Physical Fitness	0	None
1	General			McJe-1012	Moral and Civic Education	3	None
1	General			Incl 1012	Inclusiveness	3	None
1	General			MGMT 1012	Entrepreneurship	5	None
1	General			GITr 1012	Global Trends	3	None
2	General			EmTe 1021	Introduction to Emerging Technologies	5	None
	General			Econ 1012	Economics	3	None

### 13. Module Sequencing by Semester and Year

#### Year I Semester I

Module code	Module title	Course Code	Course Title	Course ECTS	Mode of delivery	Duration (hrs)	Lecture+ Tutorial+ Lab per week (hrs)
Enla-M1014	English Language Skills	FLEn1011	Communicative English Skill I	5	Parallel	135	3+0+0
Sshm-M1014	Social sciences and humanities	Psch 1011	General Psychology	5	Parallel	135	2+1+0
Sshm-M1014	Social sciences and humanities	LoCT 1011	Critical Thinking	5	Parallel	135	3+0+0
Sshm-M1014	Social sciences and humanities	GeES1011	Geography of Ethiopia & the Horn	5	Parallel	135	3+0+0
		Math 1011	Math for Natural Sciences	5	Parallel	135	2+1+0
		Phyc-1011	General Physics	5	Parallel	135	2+1+0
		SpSc 1011	Physical Fitness	NC*= 3ECTS	Parallel	81	*2 contact hours
<b>Semester Total</b>				<b>30 ECTS*</b>		891	

\* There will be a total ECTS of 33 if the NC Physical Fitness course is added

**Year I Semester II\***

<b>Module code</b>	<b>Module title</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Course ECTS</b>	<b>Mode of delivery</b>	<b>Duration</b>	<b>Lecture+ Tutorial+ Lab per week (hrs)</b>
Enla-M1014	English Language Skills	FLEn1012	Communicative English Skill II	5	Parallel	135	3+0+0
		EmTe 1021	Introduction to Emerging Technologies	5	Block	135	12+4+0
Biom-M2053	Biomedical sciences-II	Bioc2051	Biochemistry-I	5	Parallel	135	5+3+0
		McIe-1012	Moral and Civic Education	3	Block	81	4+0+0
Biom-M1033	Biomedical sciences-I	Anat1031	Human Anatomy and Histology	7	Parallel	189	4+1+2
Biom-M1033	Biomedical sciences-I	Phyl1032	Human Physiology-I	5	Parallel	135	3+1+0
Chem-M1043	Chemistry	Chem1041	Organic chemistry	5	Block	135	12+4+0
Chem-M1043	Chemistry	Chem1042	Organic chemistry laboratory	2	Block	54	0+0+9
<b>Semester Total</b>				<b>37 ECTS</b>		999	

**\* 20 Weeks semester**

**Year II Semester I\***

<b>Module code</b>	<b>Module title</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Course ECTS</b>	<b>Mode of delivery</b>	<b>Duration</b>	<b>Lecture+ Tutorial+ Lab per week (hrs)</b>
Biom-M2053	Biomedical sciences-II	Path2054	Pathology	5	Block	135	5+3+0
Phar-M2081	Pharmacognosy and Alternative Medicine I	Phar2081	Chemistry of Natural products	5	Parallel	135	3+0+0
Biom-M2053	Biomedical sciences-II	Phyl2055	Human Physiology-II	5	Block	135	2.5+1+0
Sshm-M1014	Social sciences and humanities	Anth 1012	Social Anthropology	5	Parallel	135	3+0+0
Biom-M2053	Biomedical sciences-II	Bioc2052	Biochemistry-II	5	Block	135	5+3+0
Biom-M2053	Biomedical sciences-II	Mbio2053	Microbiology, Immunology and Parasitology	7	Block	189	8+3+6
Phar-M2071	Introductory Pharmacy Module	Phar 2071	Introduction to pharmacy	2	Parallel	54	1+0+2
Phar-M2071	Introductory Pharmacy Module	Phar2072	Pharmaceutical calculations	2	Parallel	54	1+3+0
		Econ 1012	Economics	3	Parallel	81	3+0+0
<b>Semester Total</b>				<b>39 ECTS</b>		972	

**\* 20 Weeks semester**

The following were the considerations for amendment:

- Universities, which have **not** offered the Organic Chemistry Lab course in the second semester of the first year, should arrange to offer the course in the first week of Year II-Semester I and retrospectively register the students for Year I-Semester II.
- Universities, which already completed McIe-1012, can replace it with a similar module of 3 – 5 ECTS.
- In case of universities, which already offered any one of the listed courses, it is important that they replace the course/s with an equivalent course, in order to avoid credit spillover to the later years/semesters.



**Year II Semester II\***

<b>Module code</b>	<b>Module title</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Course ECTS</b>	<b>Mode of delivery</b>	<b>Duration</b>	<b>Lecture+ Tutorial+ Lab per week (hrs)</b>
Phar-M2081	Pharmacognosy and Alternative Medicine I	Phar2082	Pharmacognosy	7	Parallel	189	4 +1+3
Phar-M2101	Pharmacology module I	Phar2101	Pharmacology-I	7	Parallel	189	4+1+3
Phar-M2111	Medicinal Chemistry module I	Phar2111	Medicinal chemistry-I	7	Parallel	189	4+1+3
Phar-M2091	Dosage form Sciences I	Phar2091	Integrated physical pharmacy and pharmaceutics-I	7	Parallel	189	4+1+0
Phar-M2091	Dosage form Sciences I	Phar2092	Practical Integrated physical pharmacy and pharmaceutics-I	2	Parallel	54	0+0+3
Com-H2063	Biostatistics and Epidemiology	ComH2061	Biostatistics**	3	Block	102	2+0+0
Com-H2063	Biostatistics and Epidemiology	ComH2062	Epidemiology**	3	Block	81	2+0+0
		Incl 1012	Inclusiveness	3	Parallel	81	2+0+0
<b>Semester Total</b>				<b>39 ECTS</b>		1074	

\* 20 Weeks semester

\*\* In the event that the contents of the course History of Ethiopia & the Horn (Hist.1012) are completed before students start this semester, the course can be offered in place of Biostatistics and Epidemiology. Then Epidemiology can be offered in Year III Semester I or Year III Semester II and Biostatistics can be offered in Year III Semester II or Year IV Semester I.

**Year III Semester I\***

<b>Module code</b>	<b>Module title</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Course ECTS</b>	<b>Mode of delivery</b>	<b>Duration</b>	<b>Lecture+ Tutorial+ Lab per week (hrs)</b>
Phar-M3121	Dosage form Sciences II	Phar3121	Integrated physical pharmacy and pharmaceutics-II	7	Parallel	189	4+1+0
Phar-M3121	Dosage form Sciences II	Phar3122	Practical Integrated physical pharmacy and pharmaceutics-II	2	Parallel	54	0+0+3
Phar-M3131	Pharmacology module II	Phar3131	Pharmacology II	7	Parallel	189	4+1+3
Phar-M3141	Medicinal Chemistry module II	Phar3141	Medicinal chemistry-II	5	Parallel	135	3+1+0
Phar-M3151	Pharmaceutical Analysis	Phar3151	Pharmaceutical analysis-I	7	Parallel	189	4+1+3
Phar-M3161	Pharmacotherapeutics Module I	Phar3162	Integrated therapeutics-I	7	Parallel	189	4+1+1
Phar-M3161	Pharmacotherapeutics Module I	Intm 3161	Physical assessment	2**	Block	54	1+0+3
<b>Semester total***</b>				<b>37 ECTS</b>		999	

\* 20 Weeks semester

\*\* The physical assessment course is co-requisite to Integrated therapeutics-I

**Year III Semester II \***

<b>Module code</b>	<b>Module title</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Course ECTS</b>	<b>Mode of delivery</b>	<b>Duration</b>	<b>Lecture+ Tutorial+ Lab per week (hrs)</b>
Phar-M3191	Biopharmaceutics and Clinical Pharmacokinetics	Phar3191	Biopharmaceutics and Clinical Pharmacokinetics	7	Parallel	189	4+1+0
Phar-M3171	Pharmaceutical Technology I	Phar3171	Immunological and biological products	3	Block	81	4 +2+0
Phar-M3131	Pharmacology module II	Phar 3132	Clinical toxicology	3	Parallel	81	2 +2+0
Phar-M3181	Social and administrative pharmacy module I	Comh3181	Health service management and policies	5	Block	135	4 +0+0
Phar-M3161	Pharmacotherapeutics Module I	Phar3163	Integrated therapeutics-II	7	Parallel	189	4+1+2
		MGMT 1012	Entrepreneurship	5	Parallel	135	3 + 1+ 0
Phar-M3151	Pharmaceutical Analysis	Phar3152	Pharmaceutical analysis-II	7	Parallel	189	4+1+3
				37		918	

**\* 20 Weeks semester**

**Year IV Semester I\***

<b>Module code</b>	<b>Module title</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Course ECTS</b>	<b>Mode of delivery</b>	<b>Duration</b>	<b>Lecture+ Tutorial+ Lab per week (hrs)</b>
Phar-M4201	Pharmaceutical Technology II	Phar4201	Industrial pharmacy	7	Parallel	189	4+0.5+3
Phar-M4211	Social and administrative pharmacy module II	Phar4211	Introduction to Pharmacoeconomics	3	Parallel	81	2+2+0
Phar-M4211	Social and administrative pharmacy module II	Phar4212	Pharmaceutical Supply Chain management	7	Parallel	189	4+1+0
Phar-M4221	Pharmacotherapeutics Module II	Phar4221	Integrated therapeutics-III	7	Parallel	189	4+1+2
Phar-M4231	Pharmacognosy and Alternative Medicine II	Phar4231	Complementary and alternative medicine**	3	Parallel	81	2+1+1**
Phar-M4241	Pharmacy practice module	Phar4241	Drug informatics	3	Block	81	4+2+2
Phar-M4241	Pharmacy practice module	Phar4242	Communication skills for pharmacists	3	Block	81	4+2+2
Phar-M4241	Pharmacy practice module	Phar4243	Pharmacy law and ethics	3	Block	81	4 +1+0
<b>Semester total</b>				<b>36 ECTS</b>		1026	

**\* 20 Weeks semester**

**\*\* Consider visits to botanical gardens/registered traditional healers or their settings/Health bureau regulating the traditional healers**

**Year IV Semester II \***

<b>Module code</b>	<b>Module title</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Course ECTS</b>	<b>Mode of delivery</b>	<b>Duration</b>	<b>Lecture+ Tutorial+ Lab per week (hrs)</b>
		GITr 1012	Global Trends	3	Parallel	81	2+0+0
Phar-M4211	Social and administrative pharmacy module II	Phar4213	Medical supplies, equipment and reagents	3	Block	81	4+1+0
Phar-M4211	Social and administrative pharmacy module II	Phar4214	Pharmaceutical Marketing and promotion	3	Block	81	4+2+2
Phar-M4221	Pharmacotherapeutics Module II	Phar4222	Integrated therapeutics-IV	7	Parallel	189	4+1+2
Phar-M4241	Pharmacy practice module	Phar4244	Pharmacy practice****	7	Parallel	189	4 +0+6
Phar-M4241	Pharmacy practice module	Nurs4245	First aid	3	Block	81	4 +2+10
Phar-M4241	Pharmacy practice module	Com-H4246	Nutrition	3	Block	81	4 +2+0
Phar-M4252	Professional elective module	*	Professional elective course	5	Parallel	135	4+1+1
Phar-M4261	Pharmaceutical Research I	Phar4261	Research Methods	3	Block	81	4+1+0
Semester total*****				37		999	

\* 20 Weeks semester

\*\*\*\*The course shall be owned by all departments/units in the school/department of pharmacy and the theory and practice should give enough time for learning and practicing on the various areas of pharmacy practice such as pharmaceutical manufacturing, regulatory affairs, quality control, supply chain management, etc.

**Year V Semester I and Year V Semester II**

**Final year attachment clerkship will be year-based. Student assessment will be made at the end of the year**

<b>Module code</b>	<b>Module title</b>	<b>Course Code</b>	<b>Course Title</b>	<b>Course ECTS*</b>	<b>Mode of delivery</b>	<b>Duration</b>	<b>Number of weeks</b>
Phar-M5271	Pharmacy clerkship I	Phar5271	Ambulatory care clerkship	5	Parallel	135	3
Phar-M5271	Pharmacy clerkship I	Phar5272	Drug information service clerkship	3	Parallel	81	2
Phar-M5271	Pharmacy clerkship I	Phar5273	Internal medicine clerkship	7	Parallel	189	4
Phar-M5271	Pharmacy clerkship I	Phar5274	Hospital pharmacy clerkship	7	Parallel	189	4
Phar-M5281	Pharmacy clerkship II	Phar5281	Pediatric clerkship	7	Parallel	189	4
Phar-M5281	Pharmacy clerkship II	Phar5282	Gynecology, obstetrics and family planning clerkship	3	Parallel	81	2
Phar-M5281	Pharmacy clerkship II	Phar5283	Pharmaceutical Manufacturing clerkship	5	Parallel	135	3
Phar-M5281	Pharmacy clerkship II	Phar5284	Community pharmacy clerkship	5	Parallel	135	3
Phar-M5292	Professional elective clerkship	***	Elective attachment	5	Parallel	135	3
Phar-M5301	Pharmaceutical Research II	Phar5301	Directed study	5	Parallel	135	NA
Com-HM5311	Team Training Program	ComH5311	Team training program	7	Blocked	189	6
Phar-M5321	Comprehensive exit exam	Phar5321	Comprehensive exit exam	Non credit	Block	NA	3 weeks for preparation
<b>Semester total</b>				<b>59 ECTS</b>		1593	37**

\* To be determined based on a student's preference

\*\* A one-week off after major pharmacy clerkships is recommended and students are encouraged to plan their time so that they can **find extra time for data collection and/or experiments to fulfil the directed study requirements.**

**14. Module/Course Equivalency** (in case module/course title or ECTS is changed; or module/course substituted equivalency should be established)

Module/Course Equivalency							
NEW				OLD			
Module Title	Module ECTS	Course title	Course ECTS	Module Title	Module ECTS	Course title	Course ECTS
Pharmacology module II	10	Clinical toxicology	3	Pharmacology module	17	Applied toxicology	3
Social and administrative pharmacy module II	18	Pharmaceutical Supply Chain Management	7	Social and administrative pharmacy	21	Drug supply management	5
Pharmacy practice module	22	Pharmacy practice	7	Pharmacy practice	25	Pharmacy practice II	5
				Pharmacy practice	25	Pharmacy practice I	5
Dosage form Sciences I	9	Integrated physical pharmacy and pharmaceuticals-I	7	Dosage form Sciences	18	Integrated physical pharmacy and pharmaceuticals-I	9
		Practical Integrated physical pharmacy and pharmaceuticals-I	2				
Dosage form Sciences II	9	Integrated physical pharmacy and pharmaceuticals-II	7	Dosage form Sciences	18	Integrated physical pharmacy and pharmaceuticals-II	9
		Practical Integrated physical pharmacy and pharmaceuticals-II	2				

## 15. Module Description

Module 1 [Various General Education modules have been designated as module one as the courses are being offered by various departments and schools/faculties]

**Module name:** English language skill module

**Module category:** General

**Module code:** Enla-M1014

**Module Number:** 01

**Module weight in ECTS:** 10 ECTS

**Courses:**

Course Name	Course Code	ECTS
Communication English language I	Enla1011	5
Communication English language II	Enla1012	5

### Module Description

The module focuses on enhancing students' language competencies. The first course comprehensively presents students with the opportunity to develop their language skills (Listening, Speaking, Reading, Writing, Vocabulary and Grammar). The course focuses on the development of communication skills of the students both in academic and non-academic contexts. As a result it has a big contribution to the success of students in their other college courses. The second course entirely focuses developing the students' writing skill in both academic and non-academic contexts. Both courses must be given on semester basis as the development of the skills that the courses provide is enhanced with the extension of the period at least to the extent that they can associate them with other courses.

**Module objective:** At the end of this module, students will be able to:

- Involve in various communicative contexts
- Read and understand texts with ease
- Differentiate oral and written discourses
- Listen to conversations (communications) in English and decode message easily
- Write reports (paragraphs, essays) in academic contexts

**Module competency:** Develop writing and communication skills which facilitates college studies

**Mode of delivery:** Parallel



## English Language skill Module Course Syllabi

<b>Course title:</b>	Communicative English Skills I
<b>Course code:</b>	EnLa1011
<b>Module name:</b>	English Language skill
<b>Module code:</b>	Enla-M1014
<b>Course ECTS:</b>	5 ECTS (135 hrs)
Lecture	48 hrs
Tutorial	7 hrs
Group Work	10 hrs
Assessment	20 hrs
Home Study	50 hrs
Total	135 hrs

### Year/Semester Course is offered: Year I, Semester I

**Contact hours/ week:** 135

**Pre-requisite: None**

#### **Course description:**

This course is intended to develop and improve students' language competence. This course is aimed at developing trainees' communicative abilities in English which will help students to develop their communicative skills and overall language competence in English. Generally, this course will cover the specific language aspects described below. Developing basic functions of English language skills: reading (scanning, skimming, reading for details, summarizing, understanding the structure of a text); listening (listening for the gist, listening for details, recognizing discourse markers, noticing the structure of a lecture, understanding speaker intentions, recognizing signposting, attending and following skills); writing (summarizing a text, synthesizing choppy sentences, writing argumentative texts, writing research report, writing a project report); speaking (introducing oneself and others, interviewing, discussions, stating and supporting propositions, stating one's opinions, organizing and taking part in a debate, making a persuasive speech, questioning); vocabulary (working out meanings from context, synonyms, antonyms, collocations, definitions); grammar (relative clauses, modals, voice, conditionals, tense, reported speech).

#### **Course Objectives:**

Upon completing the course, students will be able to:

- ✓ Express their ideas in various communicative contexts (in group/ pair discussion, in public speaking settings)
- ✓ Present oral reports
- ✓ Write short reports
- ✓ Read various materials and make their own notes
- ✓ Identify the structure of oral and written discourses
- ✓ Attend their academic work at ease and with clarity

**Course mode of delivery: Parallel**

### **Course learning and teaching methods**

Classroom contact/Lecture, group work, interactive tutorial sessions (group and pair work/discussions and individual work (independent learning)

### **Assessment techniques:**

Students will be assessed out of 100% in this course. Of which 60% will be allotted for the Continuous Assessment (CA) that will be done throughout the semester. The remaining 40 % will be for the final examination. The CA includes varied types of activities that will allow the students to express themselves like real speaker or communicator. Thus, Students will be assessed continuously at least once in each of the six components. A final exam is administered to assess students'. Break down of the assessment can be seen bellow:

### **Continuous Assessment**

➤ Debates	10%
➤ Speech Delivery (2) (Impromptu & Prepared)	(5×2) 10%
➤ Group Assignment	10%
➤ Report (Oral & Written)	10%
➤ Summary & Review	10%
➤ Listening	10%
➤ Final Examination	40%

### **References:**

- Dean, M.1988. Write it; Writing Skills for intermediate learners of English. Cambridge University Press
- DEFL, 1996.College English: volume I and II.AAU.AAU Printing Press
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- Hewings, M. 1999.Advanced Grammar in use: self-study Reference Practice Book for Advanced Learners of English. Cambridge: CUP.
- MOE, 2005.Improve Your English: A Course for Ethiopian Teachers (Grade 1-4)- Face to Face Learner's Books 1&2.Addis Ababa: EMPDE
- Strong, W.1991. Writer's Choice: Grammar and Composition. Illinois: McGraw Hall

### Course Schedule:

Weeks	Study Hours	Main Topic/Sub topic/s/ Chapter	Reading material /assignments	Student Activities
1st	Lecture Hours= 2hrs Home Study= 2hrs Discussion = 4hrs	1.Introductory Unit 1.1. Listening and Speaking: Finding out about other people 1.2. Vocabulary: Learning to learn vocabulary 1.3. Grammar: Learning to use grammar for facilitating meaning	<i>College English VL.I PP 4-10</i>  <i>English Communicative Grammar pp 34-48</i>	- Introduce themselves to their partners  -find out information about others
2nd	LH= 2hrs DH= 2hrs PH= 2hrs HS=2hrs	1.4. Reading: What is involved in understanding text? 1.5. Speaking: Introducing oneself and others 1.6. Writing: A short Personal description or story	- College English VL.I  - Communicative English Skills II-unpublished - Writer's Choice	-Participate in group discussions introduce themselves write a personal description

3rd & 4 <sup>th</sup>	LH= 4hrs HS=6hrs DH= 6hrs	<p>2.AIDS</p> <p>2.1. Listening and Speaking:</p> <p>2.1.1. Understanding markers of addition and relating</p> <p>2.1.2. Listening for gist</p> <p>2.1.3. Responding to the speaker's purpose</p> <p>2.1.4. Writing a brief summary of a talk</p> <p>2.2. Vocabulary</p> <p>2.2.1. Using component parts of a word as clues to meaning</p> <p>2.2.2. Using topic relationships in order to learn words</p> <p>2.2.3. Being aware of how words collocate with each other</p> <p>2.2.4. Working out word meanings from context</p> <p>2.3. Grammar</p> <p>2.3.1. Using relative clauses</p> <p>2.3.2. Expressing warning and advice</p>	<p>College English-Teacher's Guide</p> <p>College Reading + McCarthy</p> <p>Advanced Grammar in Use + Grammar for English Language Teachers 350-79</p> <p>College English VL.I College English VL.I</p>	<p>Listen to texts and identify markers of addition and relating,</p> <p>identify the gist of the talk,</p> <p>write summary of the talk</p> <p>-guess the meaning of words depending on clues, topic relationship and collocation</p> <p>-</p>
5th & 6 <sup>th</sup>	LH=4hrs DH=4hrs PH=4hrs HS= 4hrs	<p>2.4 Reading</p> <p>2.4.1. Identifying the intended audience of a text and other critical reading skills</p> <p>2.4.2. Relating a diagram to a text</p> <p>2.5 Speaking</p> <p>2.4.3. Brain storming</p> <p>2.4.4. Public speaking</p>	<p>College English VL.I +</p> <p>Public Speaking for College and Career</p>	<p>-read passages and work on comprehension questions</p> <p>-practice and present public speeches</p>

7 <sup>th</sup> & 8 <sup>th</sup>	SH=6hrs LH=4hrs DH=6hrs	<p>3.Culture and Values</p> <p>3.1. Listening and Speaking</p> <p>3.1.1. Identifying the structure of a talk</p> <p>3.1.2. Completing a note framework</p> <p>3.2. Vocabulary</p> <p>3.2.1. Using topic relationships to learn new words</p> <p>3.2.2. Words of Greek and Latin origin</p> <p>3.2.3. Using a vocabulary network to learn words</p> <p>3.3. Grammar</p> <p>3.3.1.Using active and passive constructions for descriptive writing</p> <p>3.3.2. using time clauses for descriptive writing</p>	<p>College English-Teacher's Guide</p> <p>College English VL.I</p> <p>Grammar for English Language Teachers p.287</p>	<p>Listen to texts and identify structure of the talk</p> <p>Guess meaning of words based on their origin and topic relationship</p> <p>Practice using active and passive constructions</p>
9 <sup>th</sup> and 10 <sup>th</sup>	SH= 4 DH= 5 LH= 4 PH=3	<p>3.4. Reading</p> <p>3.4.1. Critical reading</p> <p>3.4.2. Reading for main ideas</p> <p>3.4.3. Reading for detail</p> <p>3.5. Speaking</p> <p>3.5.1. Understanding reference</p> <p>3.5.2. Brainstorming</p> <p>3.5.3. Organizing and taking part in a debate</p>	<p>College English VL.I</p> <p>Public Speaking for College and Career</p>	<p>-read passage and identify main idea and specific details</p> <p>-participate in debating organized in the classroom</p> <p>-write summary and</p>
11 <sup>th</sup> and 12 <sup>th</sup>	LH=5hrs HS=5hrs DH= 6hrs	<p>4.Improving Study Practices</p> <p>4.1. Listening and speaking</p> <p>4.1.1. Thinking about what you do when you listen to a lecture and take notes</p> <p>4.1.2. Understanding listing and</p>	<p>College English-Teacher's Guide</p>	<p>listen to lectures and take notes identify main sections of a lecture</p>

<p>13<sup>th</sup> &amp; 14<sup>th</sup></p>	<p>LH=5hrs HS=5hrs DH= 6hrs</p>	<p>4.4. Reading  4.4.1. Skimming for gist  4.4.2. Critical reading and evaluating  4.4.3. Using reference/textual markers  4.5. Speaking  4.5.1. Brainstorming and discussing on what makes a good learner  4.6 Writing  4.6.1. Summarizing a talk  4.6.2. Summarizing an academic article  4.6.3. Writing an essay on learning English</p>	<p>College English VL.I   College English VL. I   Writers' Choice</p>	<p>read passage and identify references and textual markers    practice writing summary and essays</p>
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## **Communicative English Language Skills II**

**Course title:** Communicative English Skills II

**Course code:** EnLa1012

**Module name:** English Language skill

**Module code:** Enla-M1014

**Course ECTS:** 5 ECTS (135 hrs)

Lecture	48 hrs
Tutorial	7 hrs
Group Work	10 hrs
Assessment	20 hrs
Home Study	50 hrs
Total	135 hrs

**Year/Semester Course is offered:** Year I, Semester II

**Contact hours/ week:**

**Pre-requisite:** None

**Course description:**

Communicative English Language Skills II Module is a continuation of Communicative English I Module, and it mainly aims to provide first year college students proficiency with reading, speaking and writing skills. It also aims to help students learn vocabularies that are assumed unfamiliar to them. In the grammar part, with the intention of providing explanations, brief notes are given in each unit.

The module consists of five units with three supplementary reading at the end of the Module. The supplementary readings are included to support ideas included in the reading passages in units 1-3.

Students are advised to read the references put in the box for further learn the grammar points included in the Module.

**Course Objectives:**

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

**Assessment techniques:**

**Teachers and Students Role**

**References:**

Azar, B. S. (2003). Fundamentals of English grammar. Longman.

Eggenchwiler, J., & Biggs, E.D. (2001). Writing: Grammar, Usage, and Style. New York. Hungry Minds. Inc

Lucy, J. A., & Lucy, L. A. (Eds.). (1993). Reflexive Language: Reported Speech and Meta pragmatics. Cambridge University Press.

Murphy, R. (2012). English Grammar in Use. Ernst Klett Sprachen.  
Naylor, H., & Murphy, R. (2007). Essential Grammar in Use. Supplementary Exercises.  
With Answers. Ernst Klett Sprachen

### **Course Contents**

#### **Unit I : Life Skills**

**Part I** Reading passage: The concept of life skills

**Part II** Grammar: Active and passive voices

**Part III** Speaking

**Part IV** Writing

#### **Unit II: Speculations about the future of Science**

**Part I** Reading passage: Grassroots attack in bilharzia

**Part II** Grammar: Future Tense

**Part III** Speaking

**Part IV** Writing

#### **Unit III: Environmental protection**

**Part I** Reading: Environmental Challenges: A river run through it

**Part II** Grammar: Modal verbs

**Part III** Speaking

**Part IV** Writing

#### **Unit IV: Indigenous Knowledge**

**Part I** Reading: A local Pathway to Global Development

**Part II** Grammar: Reported Speech

**Part III** Speaking

**Part IV** Writing

#### **Unit V: Cultural Heritage**

**Part I** Reading: Cultural Heritage What is it? Why is it important

**Part II** Grammar: Relative Clauses

**Part III** Speaking

**Part IV** Writing

#### **Supplementary Readings**

A. Environmental Problems

B. The Origin of Humans: The Record From the Afar of Ethiopia

C. Tourism Can be Used to Preserve Ethiopia's Cultural and Historic Wealth



## Module 1: Social Sciences and humanities

**Module name:** Social sciences and humanities module

**Module category:** General

**Module code:** Sshm-M1024

**Module weight in ECTS:** 20 ECTS

**Courses:**

Course Name	Course Code	ECTS
General Psychology	Psyc 1021	5
Critical Thinking	LoCT 1011	5
Geography of Ethiopia and the Horn	GeES1011	5
Social Anthropology	Anth 1012	5

**Module description:** the module will try familiarizing students with social, psychological and ethical issues of the society and human being. The module covers key concepts of psychology & civic and ethics.

**Module objective:** to equip students with the psychological ethical approaches to live up ethically with the complex human social life.

**Module competency:**

- Develop skills to enhance students' ability to analyze critically the dynamics of society and current social issues.
- Develop critical thinking and problem solving skills
- Enhance students' Social research skills
- Improve both your communication and group interaction skills
- Gain knowledge about the theoretical discourses and practices of state/government, society and citizenship and their mutual interplay especially in the context of Ethiopia;

**Mode of delivery:** Parallel

Mode of Assessment:

### Assessment Criteria

#### A. Assessment Criteria

The assessment criteria are based on continuous assessment of class activities, individual and group assignment, field visit and report writing, test and final exams.

This in turn can be broken down in to;

- Group assignments .....30%
- Tests/quizzes .....30%
- Final Exam.....40%
- Total.....100%

### Learning activities and teaching methods

#### A. Learning Activities

Students are expected to undertake among others the following major learning activities:

- Engage in learning by doing (independent study, group assignments, presentation, report writing, and etc...)
- Participation and note takings during class lectures and debates and discussions;

- Analysis, summarization and presentations of chapter/article, motions on selected issues;

**B. Teaching Methods**

- The course facilitator is expected to lecture for introducing concepts and topics, and give
- references, facilitate discussions, ask questions, give and correct assessments,
- Arrange and facilitate seminar sessions by inviting professionals for public lectures or debates on subject related issues.

## **Social sciences and humanities module Course syllabi**

**Course Title:** General Psychology

**Course Code:** Psyc 1021

**Module name:** Social sciences and humanities module

**Module code:** Sshm-M1024

**Course ECTS:** 5 ECTS

**Year/Semester Course is offered:** Year I Semester I

**Contact hours/ week:** 135

Lecture	48 hrs
Tutorial and Problem Solving	10 hrs
Group Discussion	20 hrs
Assessment	8 hrs
Presentation	14 hrs
Home Study	35 hrs
Total	135 hrs

**Prerequisite course:** None

### **Course Description:**

- This introductory course will provide students with an overview of the current body of knowledge and methods of the science of psychology. It is a general overview course focusing on the scientific study of both the behavioral and mental processes of human beings and animals. More specifically, topics will be covering: historical foundations of psychology, scientific thoughts in psychology, research methodology, biological basis of behavior, human development, sensation and perception, learning, memory and forgetting, motivation and emotion, personality, psychological disorders and psychotherapy.

### **Course Objectives:**

An overriding course goal is to introduce students about the basic concepts of psychology and to provide access about the ways psychologists apply psychological knowledge, principles, and theories to understand their lives and the lives of others. Toward this goal, upon completion of this course, students will be able to:

- Clearly describe psychological concepts
- Compare and contrast the major perspectives in Psychology
- Explain the various research methods in Psychology
- Recognize the link between human biology and behavior

- Discuss different aspects of human development
- Comprehend how people sense and give meaning to their environment
- Explain the process of learning a new behavior from different theoretical basis
- Elucidate about memory and forgetting processes
- Describe motivational and emotional processes
- Discuss personality theories
- Describe the characteristics of major psychological disorders
- Appreciate the practical value of psychology

### **Course learning and teaching methods**

#### **Assessment Method:**

Dominantly, there will be formative continuous assessment (quizzes, individual and group work, discussion, class activity, assignments) just at the end of each week. Moreover, summative assessments such as mid semester and final examination will be carried out.

#### **Assessment Arrangement**

Quizzes/Tests	20%
Group/ individual Assignments with presentation	30%
Class participation and attendance	10%
Final Examination	40%

### **Teachers and Students Role**

#### **References:**

- Feldman, R.S. (1999). Essentials of Understanding psychology: McGraw Hill college
- Lahey, B. (2004) Psychology: An Introduction (8<sup>th</sup>ed.) Boston: McGraw Hill Book Company.
- Morgan C. (2003). Introduction to Psychology. 6<sup>th</sup> ed McGraw Hill Book Company
- McMahan, J, McMahan, F, and Ramano, T. (1995). Psychology & you (2<sup>nd</sup>ed.) New York: McGraw Hill Book Company.
- Miles H., Frank D. and Jonathan F. (2005). Psychology. Alden Press, Oxford, UK.
- Note: Students are also recommended to read other possible sources like the research articles, newsletters, magazines, etc

**Course Schedule: By Time, Contents and Reading Materials**

Days	Contact Hrs	Topic/Subtopics/ Chapters	Reference	Remark
1	3:12 hrs	Unit 1: Introduction to Psychology 1.1. Definition of psychology 1.2. The Goals of Psychology 1.3. The subject Matter of psychology 1.1. Historical development of psychology	<ul style="list-style-type: none"> <li>• Robert S. Feldman (1996). Essentials of Understanding psychology. Pp.4-238</li> <li>• Morgan C. (2003). Introduction to Psychology. 6<sup>th</sup> ed. Pp1-24</li> </ul>	
2	3:12 hrs	1.2. Perspectives in psychology 1.3. Major Areas in psychology 1.4. Research Methods in Psychology		
3	3:12 hrs	Unit 2: Biological Basis of Behaviors 2.1. Heredity (gene) Vs Behavior 2.2. Nerve system Vs Behavior 2.3. Endocrine system Vs Behavior	<ul style="list-style-type: none"> <li>• Robert S. Feldman (1996). Essentials of Understanding psychology. Pp.39-79</li> <li>• Morgan C. (2003). Introduction to Psychology. 6<sup>th</sup> ed. Pp 25-79</li> <li>• Robert S. Feldman (1996). Essentials of Understanding psychology. Pp.331-376</li> <li>• Morgan C. (2003). Introduction to Psychology. 6<sup>th</sup> ed. Pp461-126</li> </ul>	
4	3:12 hrs	Unit 3: Human development 3.1. The nature of human development 2.2. Issues or controversies in development		
5	3:12 hrs	3.3. Theories of human development <ul style="list-style-type: none"> <li>• cognitive development</li> <li>• psychosexual development</li> <li>• psychosocial development</li> <li>• moral development</li> </ul>		
6	3:12 hrs	Unit 4: Sensations and Perception 4.1 Definition: Sensation and Perception 4.2 Sensing the environment	<ul style="list-style-type: none"> <li>• Robert S. Feldman (1996). Essentials of Understanding psychology. Pp.81-126</li> <li>• Morgan C. (2003). Introduction to Psychology. 6<sup>th</sup>ed. Pp 80-136</li> </ul>	

		<p>4.3 Perceptual processes</p> <p>4.3.1 Attention</p> <p>4.3.2 Organization</p> <p>4.3.3 Interpretation</p>		
7	3:12 hrs	<p>Unit 5: Learning</p> <p>5.1 Definition and characteristics of learning</p> <p>5.2 Theories of learning</p> <p>5.2.1. Pavlov’s classical conditioning</p> <p>5.2.2. Operant conditioning</p>	<ul style="list-style-type: none"> <li>• Robert S. Feldman (1996). Essentials of Understanding psychology. Pp.163-201</li> <li>• Morgan C. (2003.). Introduction to Psychology. 6<sup>th</sup> ed , Pp 137-180</li> </ul>	
8	3:12 hrs	<p>5.2.3. Social learning theory</p> <p>5.2.4. Cognitive view of learning</p>		
9	3:12 hrs	<p>Unit 6: Memory and forgetting</p> <p>6.1 Processes of memory</p> <p>6.2 Sensory memory</p> <p>6.3 Short term memory</p> <p>6.4 Long term memory</p> <p>6.5 Theories of forgetting</p>	<ul style="list-style-type: none"> <li>• Robert S. Feldman (1996). Essentials of Understanding psychology. Pp.203-234</li> <li>• Morgan C. (2003.). Introduction to Psychology. 6<sup>th</sup> ed. Pp 181-224</li> </ul>	
10	3:12 hrs	<p>Unit 7: Motivation and Emotion</p> <p>7.1. The nature of motivation</p> <p>7.2. Theories of motivation</p> <p>7.3. Conflict motives &amp; frustration</p> <p>7.4. Definition of emotions</p> <p>7.5. Components of emotion</p> <p>7.6. Theories of emotion</p>		
11	3:12 hrs	<p>Unit 8: Stress and Coping mechanisms</p> <p>8.1. The nature of stress</p> <p>8.2. Sources of stress (stressors)</p> <p>8.3. Coping mechanisms of stress</p>	<ul style="list-style-type: none"> <li>• Robert S. Feldman (1996). Essentials of Understanding psychology. Pp.411-451</li> <li>• Morgan C. (2003). Introduction to Psychology. 6<sup>th</sup> ed. Pp307-338</li> </ul>	

12	3:12 hrs	Unit 9: Personality 9.1. The nature of personality 9.2. Theories of personality	<ul style="list-style-type: none"> <li>• Robert S. Feldman (1996). Essentials of Understanding psychology. Pp379-409</li> <li>• Morgan C. (2003). Introduction to Psychology. 6<sup>th</sup> ed. Pp 563-611</li> <li>• Robert S. Feldman (1996). Essentials of Understanding psychology. Pp.411-451</li> <li>• Morgan C. (2003). Introduction to Psychology. 6<sup>th</sup> ed. Pp-612-724</li> </ul>	
13	3:12 hrs	9.3. The measurement of personality Unit 10: Abnormal Behaviors and psychotherapy 10.1. Criteria/approaches of abnormality		
14	3:12 hrs	10.2. Classifications of abnormal behaviors 10.3. Treatment of psychological disorders		
15	3:12 hrs	Exam Preparation week		

**Social sciences and humanities module Course syllabi**

**Course Title:** Critical Thinking

**Course Code:** LoCT 1011

**Module name:** Social sciences and humanities module

**Module code:** Sshm-M1024

**Course ECTS:** 5 ECTS

**Year/Semester Course is offered:** Year I Semester I

**Contact hours/ week:** 135

Lecture	48 hrs
Tutorial and Problem Solving	10 hrs
Group Discussion	20 hrs
Assessment	8 hrs
Presentation	14 hrs
Home Study	35 hrs
Total	135 hrs

Course Information	
Course Objectives	<p><i>At the end of the course, students should be able to:</i></p> <ul style="list-style-type: none"><li>• Understand the relationship of logic and philosophy,</li><li>• Recognize the core areas of philosophy,</li><li>• Appreciate the necessity learning logic and philosophy,</li><li>• Understand basic logical concepts, arguments,</li><li>• Understand deductiveness, inductiveness, validity, strength,</li></ul>



	<p>soundness, and cogency,</p> <ul style="list-style-type: none"> <li>• Develop the skill to construct sound argument and evaluate arguments;</li> <li>• Cultivate the habits of critical thinking and develop sensitivity to clear and accurate usage of language;</li> <li>• Differentiate cognitive meanings from emotive meanings of words,</li> <li>• Differentiate standard forms of categorical propositions from other types of sentences used in any language,</li> <li>• Apply symbols to denote standard forms of categorical propositions to form further logical assertions among them.</li> <li>• Develop logical and open-mind that weighs ideas and people rationally;</li> <li>• Develop confidence when arguing with others,</li> <li>• Demonstrate logical argumentative ability,</li> <li>• Develop logical reasoning skill in their day to day life, and</li> <li>• Appreciate logical reasoning, disproving mob-mentality and avoid social prejudice.</li> <li>• Understand the basic concepts and principles of critical thinking.</li> <li>• Understand the criterion of good argument.</li> <li>• Identify the factors that affect critical thinking.</li> <li>• Apply critical thinking principles to real life situation.</li> </ul>
<p>Course Description</p>	<p>Logic and Critical Thinking is an inquiry that takes arguments as its basic objects of investigation. Logic is concerned with the study of arguments, and it seeks to establish the conditions under which an argument may be considered acceptable or good. Critical thinking is an exercise, a habit, a manner of perception and reasoning that has principles of logic as its fulcrum, and dynamically involves various reasoning skills that ought to be human approach to issues and events of life. To think critically is to examine ideas, evaluate them against</p>

	<p>what you already know and make decisions about their merit. The aim of logic and critical thinking course is to maintaining an „objective“ position. When you think critically, you weigh up all sides of an argument and evaluate its validity, strengths and weaknesses. Thus, critical thinking skills entail actively seeking all sides of an argument evaluating the soundness of the claims asserted and the evidence used to support the claims. This course attempts to introduce the fundamental concepts of logic and methods of logical reasoning. The primary aim of this course is to teach students essential skills of analyzing, evaluating, and constructing arguments, and to sharpen their ability to execute the skills in thinking and writing.</p>	
WEEKS	Course Contents	Reading
1 <sup>st</sup> and 2 <sup>nd</sup>	<p><b>Logic and Philosophy</b></p> <ul style="list-style-type: none"> <li>✚ Meaning and Definition of philosophy</li> <li>✚ Core Branches of Philosophy</li> <li>✚ Importance of Learning Logic and Philosophy</li> </ul>	
3 <sup>rd</sup> , 4 <sup>th</sup> and 5 <sup>th</sup>	<ul style="list-style-type: none"> <li>✚ <b>Basic Concepts of Logic</b></li> <li>✚ Basic Concepts of Logic</li> <li>✚ Techniques of recognizing arguments.</li> <li>✚ Types of Arguments (deductive and Inductive)</li> <li>✚ Evaluation of Arguments</li> </ul>	
6 <sup>th</sup> and 7 <sup>th</sup>	<p><b>Logic and Language</b></p> <p>Logic and Meaning</p> <ul style="list-style-type: none"> <li>▪ Cognitive and Emotive Meaning of Words</li> <li>▪ Intentional and Extensional Meaning of Terms</li> </ul> <p>Logic and Definition</p> <ul style="list-style-type: none"> <li>▪ Types and Purposes of Definition</li> </ul>	

	<ul style="list-style-type: none"> <li>▪ Techniques of Definition</li> <li>▪ Criteria for Lexical Definitions</li> </ul>	
8 <sup>th</sup> and 9 <sup>th</sup>	<p><b>Basic Concepts of Critical Thinking</b></p> <ul style="list-style-type: none"> <li>❖ Meaning and Definition of Critical Thinking.</li> <li>❖ Principles of Critical Thinking.</li> <li>❖ Criterion/Standard of Argument Good Argument.</li> <li>❖ Factors Affecting Critical Thinking.</li> <li>❖ Relevance of Critical Thinking.</li> </ul>	
10 <sup>th</sup> , 11 <sup>th</sup> , 12 <sup>th</sup> and 13 <sup>th</sup>	<p><b>Logical Reasoning and Fallacies</b></p> <p>Types of Fallacies: Formal and Informal</p> <p>Categories of Informal Fallacies</p> <ul style="list-style-type: none"> <li>✚ Fallacies of Relevance</li> <li>✚ Fallacies of Weak Induction</li> <li>✚ Fallacies of Presumption</li> <li>✚ Fallacies of Ambiguity</li> <li>✚ Fallacies of Grammatical Analogy</li> </ul>	

14 <sup>th</sup> , 15 <sup>th</sup> and 16 <sup>th</sup>	<p><b>Categorical Propositions</b></p> <p>Categorical Propositions</p> <ul style="list-style-type: none"> <li>✚ The Components of Categorical Propositions</li> <li>✚ Attributes of Categorical Propositions: Quality, Quantity, and Distribution</li> <li>✚ Representing Categorical Propositions <ul style="list-style-type: none"> <li>▪ Venn Diagrams</li> <li>▪ Boolean and Aristotelian Square of Oppositions</li> </ul> </li> <li>✚ Evaluating Immediate Inferences: Venn Diagrams and Square of Oppositions</li> </ul> <p>Logical Operations: Conversion, Obversion, and Contraposition</p>	
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Teaching & Learning Methods/strategy	For the successful completion of this course, different <i>Student-Centered</i> teaching methodologies will be applied. These include: Semi-Lecture, Class Discussion, Group discussion, Pair Discussion, peer-Learning, Video/Audio Visual, and Self-Reading, Debate						
Assessment/ Evaluation	The evaluation scheme will be as follows:						
	Test 1	Test 2	Test 3	Quiz	Assignment	Final	Total
	10%	10%	15%	5%	10%	50%	100%
Roles of the Instructor	He/she will come to the class regularly on time and deliver the lecture in a well-organized manner. Besides, he/she is responsible to give feedback for each assessment.						
Roles of the students	The success of this course depends on the students' individual and collective contribution to the class discussions. Students are expected to participate voluntarily, or will be called upon, to contribute to set exercises and problems. Students are also expected to read the assigned readings and prepare the cases before each class so that they could contribute effectively to class discussions. Students must attempt assignments by their own. Proficiency in this course comes from individual knowledge and understanding. Copying the works of others is considered as serious offence and leads to disciplinary actions.						
Text and reference books	<p>Hurley, Patrick J. (2014) A Concise Introduction to Logic, 12th Edition, Wadsworth, Cengage Learning.</p> <p>Hurley, Patrick J. (2012) A Concise Introduction to Logic, 11th Edition, Wadsworth, Cengage Learning.</p> <p><u>Reference Books</u></p> <p>Copi, Irving M. and Carl Cohen, (1990) Introduction to Logic, New York: Macmillan Publishing Company.</p> <p>Damer, Edward. (2005). Attacking faulty reasoning. A practical guide</p>						



	<p>to fallacy free argument. Wadsworth Cengage learning, USA.</p> <p>Fogelin, Robert, J, (1987) Understanding Arguments: An Introduction to Informal Logic, New York: Harcourt Brace Jvanovich Publisher.</p> <p>Guttenplan, Samuel: (1991) The Language of Logic. Oxford: Blackwell Publishers</p> <p>Stephen, C.(200) The Power of Logic. London and Toronto: Mayfield Publishing company.</p> <p>Simico, N.D and G.G James. (1983) Elementary Logic, Belmont, Ca: Wadsworth Publishing Company.</p> <p>Walelign, Emuru, (2009) Freshman Logic, Addis Ababa.</p>
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**Social sciences and humanities module Course syllabi**

**Course Title:** Geography of Ethiopia & the Horn

**Course Code:** GeES1011

**Module name:** Social sciences and humanities module

**Module code:** Sshm-M1024

**Course ECTS:** 5 ECTS

**Year/Semester Course is offered:** Year I Semester I

**Contact hours/ week:** 135

Lecture	48 hrs
Tutorial and Problem Solving	10 hrs
Group Discussion	20 hrs
Assessment	8 hrs
Presentation	14 hrs
Home Study	35 hrs
Total	135 hrs

<p>Course Description</p>	<p>This course attempts to familiarize students with the basic geographic concepts particularly in relation to Ethiopia and the Horn of Africa. It is also intended to provide students a sense of place and time (geographic literacy) that are pivotal in producing knowledgeable and competent citizens that are able to comprehend and analyze problems and contribute to their solutions. The course consists of four parts. The first part provides a brief description on the location, shape and size of Ethiopia as well as basic skills of reading maps. Part two introduces the physical background and natural resource endowment of Ethiopia and the Horn which includes its geology and mineral resources, topography, climate, drainage and water resources, soil, fauna and flora. The third part of the course focuses on the demographic characteristics of the country and its implications on economic development. The fourth component of the course offers treatment of the various economic activities of Ethiopia and the Horn which include agriculture, manufacturing and service sectors. Moreover, Ethiopia in a globalizing world is treated in the perspectives of the pros and cons of globalization on its natural resources, population and socio economic conditions.</p>
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Course Objectives	<p>Upon completion of this course the students will be able to:</p> <ul style="list-style-type: none"> <li>• Describe the location, shape and size of Ethiopia and the Horn</li> <li>• Explain the implications of location, shape and size of Ethiopia and theHorn on the physical environment, socioeconomic and political aspects.</li> <li>• Elaborate the major geological events; the resultant landforms and mineralresources of Ethiopia and the Horn.</li> <li>• Identify the major drainage systems and water resources of Ethiopia andtheir implications for regional development and integration.</li> <li>• Develop an understanding of the climate of Ethiopia, its dynamics andimplications on the livelihoods of its inhabitants.</li> <li>• Examine the spatio-temporal distribution and abundance of natural vegetation, wildlife and Soil resources of Ethiopia.</li> <li>• Discuss the demographic attributes and dynamics as well as the ethnicdiversity of Ethiopia.</li> <li>• Read maps as well as compute basic demographic and climatic rates</li> <li>• Appreciate the biophysical and socio-cultural diversities in Ethiopia and the Horn</li> <li>• Explicate the major types of economic activities in Ethiopia; discern their spatiotemporal distributions and their contributions to the overall development of the country.</li> <li>• Comprehend the effects of globalization on the socioeconomic development of Ethiopian and the Horn.</li> </ul>
Expected Learning Outcomes	<ul style="list-style-type: none"> <li>➤ Acquire basic knowledge on the geographic attributes of Ethiopia andHorn</li> <li>➤ Develop a sense of appreciation and tolerance of cultural diversities andtheir interactions</li> <li>➤ Acquire general understanding of physical geographic processes, and</li> </ul>

	<p>human-environment relationships</p> <ul style="list-style-type: none"> <li>➤ Develop ethical aptitudes and dispositions necessary to live in harmony with the natural environment</li> <li>➤ Develop an understanding of national population distributional patterns and dynamics</li> <li>➤ Conceptualize the comparative advantages of economic regimes; and understand the impacts of globalization.</li> <li>➤ Understand their country's overall geographic conditions and opportunities; and be proud of the natural endowments and cultural richness that help them develop a sense of being an Ethiopian.</li> </ul>
Mode of Delivery	Semester based/parallel
Target Group	All first year undergraduate students
Year /Semester	Year I/ Semester I and or II
Pre requisite	None
Status of Course	Common Course

**Course Content**

Weeks	Conceptual focus
1 & 2	<p><b>I. INTRODUCTION (5 hrs)</b></p> <p>Geography: Definition, scope, themes and approaches</p> <p>Location, Shape and Size of Ethiopia and the Horn</p> <p style="padding-left: 40px;">Location and its effects</p> <p style="padding-left: 40px;">The shape of Ethiopia and its implication</p> <p style="padding-left: 40px;">The size of Ethiopia and its implications</p> <p style="padding-left: 40px;">Basic Skills of Map Reading</p>
	<p><b>CHAPTER TWO: THE GEOLOGY OF ETHIOPIA AND THE HORN (5hrs)</b></p> <p style="padding-left: 40px;">Introduction</p> <p style="padding-left: 40px;">The Geologic Processes: Endogenic and Exogenic Forces</p> <p style="padding-left: 40px;">The Geological Time scale and Age Dating Techniques</p>

<p style="text-align: center;"><b>2, 3 &amp; 4</b></p>	<p style="text-align: center;">Geological Processes and the Resulting Landforms</p> <p style="text-align: center;">The Precambrian Era geologic processes and resultant features</p> <p style="text-align: center;">The Paleozoic Era geologic processes and resultant features</p> <p style="text-align: center;">The Mesozoic Era geologic processes and resultant features</p> <p style="text-align: center;">2.4.4. The Cenozoic Era geologic processes and resultant features</p> <p style="text-align: center;">Rock and Mineral Resources of Ethiopia</p>
<p style="text-align: center;"><b>4 &amp; 5</b></p>	<p><b>CHAPTER THREE: THE TOPOGRAPHY OF ETHIOPIA AND THE HORN (3hrs)</b></p> <p style="text-align: center;">Introduction</p> <p style="text-align: center;">Physiographic Divisions</p> <p style="text-align: center;">The Western Highlands and Lowlands</p> <p style="text-align: center;">The Southeastern Highlands and Lowlands</p> <p style="text-align: center;">The Rift Valley</p> <p style="text-align: center;">The Impacts of Relief on Biophysical and Socioeconomic Conditions</p>
<p style="text-align: center;"><b>5 &amp; 6</b></p>	<p><b>CHAPTER FOUR: DRAINAGE SYSTEMS AND WATER RESOURCES OF ETHIOPIA AND THE HORN (5hrs)</b></p> <p style="text-align: center;">Introduction</p> <p style="text-align: center;">Major Drainage Systems of Ethiopia</p> <p style="text-align: center;">Water Resources: Rivers, Lakes, and Subsurface Water</p> <p style="text-align: center;">General Characteristics of Ethiopian Rivers</p> <p style="text-align: center;">Water Resources Potentials and Development in Ethiopia</p>

<p style="text-align: center;"><b>7, 8 &amp; 9</b></p>	<p><b>CHAPTER FIVE: THE CLIMATE OF ETHIOPIA AND THE HORN (7hrs)</b></p> <p style="text-align: center;">Introduction</p> <p style="text-align: center;">Elements and Controls of Weather and Climate</p> <p style="text-align: center;">Spatiotemporal Patterns and Distribution of Temperature and Rainfall in Ethiopia</p> <p style="text-align: center;">Agro-ecological Zones of Ethiopia</p> <p style="text-align: center;">Climate and its Implications on Biophysical and Socioeconomic Aspects</p> <p style="text-align: center;">Climate Change/Global Warming: Causes, Consequences and Response Mechanisms</p>
<p style="text-align: center;"><b>9, 10 &amp; 11</b></p>	<p><b>CHAPTER SIX: SOILS, NATURAL VEGETATION AND WILDLIFE RESOURCES OF ETHIOPIA AND THE HORN (6hrs)</b></p> <p style="text-align: center;">Introduction</p> <p style="text-align: center;">Ethiopian Soils: Types, Degradation and Conservation</p> <p style="text-align: center;">Types and Distribution of Natural Vegetations in Ethiopia</p> <p style="text-align: center;">Natural vegetation: Uses, Degradation and Conservation Strategies</p> <p style="text-align: center;">Wildlife Resources of Ethiopia: Types, Importance, and Conservation Strategies</p>
<p style="text-align: center;"><b>11, 12 &amp; 13</b></p>	<p><b>CHAPTER SEVEN: POPULATION OF ETHIOPIA AND THE HORN (8hrs)</b></p> <p style="text-align: center;">Introduction</p> <p style="text-align: center;">Population Data: Uses and Sources</p> <p style="text-align: center;">Population Dynamics: Fertility, Mortality and Migration</p> <p style="text-align: center;">Population Distribution and Composition</p>

	Sociocultural Aspects of Ethiopian Population: Education, Health and Languages

	7.6. Settlement Types and Patterns
14, 15 & 16	<p><b>CHAPTER EIGHT: ECONOMIC ACTIVITIES IN ETHIOPIA (9hrs)</b></p> <p>Introduction</p> <p>Mining, Fishing and Forestry</p> <p>Agriculture in Ethiopian</p> <p>Contributions, potentials and characteristics of agriculture in Ethiopia</p> <p>Agricultural systems in Ethiopia</p> <p>Major problems of Ethiopian agriculture</p> <p>Manufacturing in Ethiopia</p> <p>Manufacturing: essence and contributions</p> <p>Types, characteristics and distribution of manufacturing</p> <p>Industrial development in Ethiopia: Challenges and Prospects</p> <p>The Service Sector in Ethiopia</p> <p>Transportation and communication in Ethiopia: types, roles and characteristics</p> <p>Trade in Ethiopia: types, contributions and characteristics</p> <p>Tourism in Ethiopia: Types, major tourist attraction sites, challenges and prospects</p>
<b>Teaching Methods</b>	Gap Lecture, Peer/ group Discussion and Reflection, Reading Assignment.
<b>Assessment Methods</b>	Paper & presentation (20 %); Mid exam (30 %); Final examination (50 %)
	Date of Submitting Assignment: _____
	As a student of this university, you are expected to abide by the code of conduct of students enshrined in the university's legislation. Academic

<p><b>Course Policy</b></p>	<p>dishonesty including cheating (exam or attendance), fabrication and plagiarism will not be tolerated and will be reported to concerned bodies for appropriate action. Moreover, you are expected to actively participate in classroom discussions through asking and answering questions, raising issues, giving constructive feedbacks, accomplishing and submitting assignments according to the program schedule. You are also expected to attend class regularly. Attendance will be taken regularly and any absenteeism without tangible reasons will severely affect your performance and grade. Side talks, moving chairs and creating all sorts of disturbance are intolerable. If you miss 20% of the class attendance, you will be cancelled from the course. You should come to the class in time. You are also supposed to come to class with your appropriate learning materials like note book, handouts and other reference materials.</p>
<p><b>References</b></p>	<ul style="list-style-type: none"> <li>• A.D. Tathe.(2012). Lecture Notes on Climatology: For Intermediate Met Training Course, Indian Meteorological Department.</li> <li>• Addis Ababa University (2001). Introductory Geography of Ethiopia, Teaching Text, Department of Geography.</li> <li>• Assefa M., Melese W., Shimelis G.(2014). Nile River Basin; Ecohydrological Challenges, Climate Change and Hydropolitics. Springer International Publishing, Switzerland.</li> <li>• B. D, Ray (1989). Economics for Agriculture: Food, Farming and the Rural Economy. Macmillan.</li> <li>• CSA 1994 &amp; 2007. Population and Housing Census Results. CSA: A.A.</li> <li>• Diao, Xinshen,. 2007. The Role of Agriculture in Economic Development: Implications for Sub Saharan Africa. Sustainable Solutions for ending Hunger and Poverty, Research Report 153. IFPRI.Ethiopia.</li> <li>• Engdawork Assefa(2015). Characterization and classification of major agricultural soils in CASCEP intervention weredas in the central highlands of Oromia Region, Ethiopia, Addis Ababa University</li> <li>• FDRE.2001 Ministry of Water Resources, National Metrological Survey,</li> </ul>

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<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Girma Kebede(2017). Society and Environment in Ethiopia</i></li> <li>• Hartshorne, T. &amp; J. Alexander (1988). <i>Economic Geography</i>, 3<sup>rd</sup> Ed.</li> <li>• <i>Hoogvelt, A (2001). Globalization and the post-colonial world. The New political Economy of Development. Basingstoke plagrave.</i></li> <li>• <i>Hurni. H. 1988. Ecological Issues in the Creation of Ethiopia. Paper presented in the National Conference on Disaster prevention and preparedness Strategy for Ethiopia, A.A</i></li> <li>• International Centre for Migration Policy Development (ICMPD) (2008). <i>East Africa Migration Route Initiative Gaps &amp; Needs Analysis Project Country Reports: Ethiopia, Kenya, Libya. Vienna</i></li> <li>• Laurence G., Jeremias M., Tilahun A., Kenneth M.(2012). <i>Integrated Natural Resource Management in The Highlands of Eastern Africa; From Concept to Practice. New York, Earthscan.</i></li> <li>• Lloyd, P. &amp; P. Dickens (1977). <i>Location in Space. Harper @ Row.</i></li> <li>• Mesfin Woldemariam (1972). <i>Introduction to Ethiopian Geography, AddisAbaba,</i></li> <li>• Ministry of Agriculture/MOA/ (1998). <i>Agro-ecological zones of Ethiopia: Natural Resources Management and Regulatory Department, AddisAbaba</i></li> <li>• Morgan R.P.C (2005). <i>Soil Erosion and Conservation. National Soil Resources Institute, Carnfield University. Blackwell Publishing, Oxford, UK.</i></li> <li>• OXFAM (2018). <i>Horn of Africa climate crisis response. Regional summary Pausewang, Siegfried (1990), Ethiopian Rural Development Options.</i></li> <li>• Plant genetic resource center (1995). <i>Ethiopia: country report to the FAO International Technical Conference on Plant Genetic Resource, AddisAbaba</i></li> <li>• Robert, E.G, James, F.P &amp; L. Michael T. (2007). <i>Essentials of Physical Geography. Thomson Higher Education, Belmont, 8<sup>th</sup> edition.</i></li> <li>• UNDP, FAO (1984) <i>Ethiopia Forest Resources and Potential for</i></li> </ul>
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	<p>Development;An assistance to land use planning.</p> <ul style="list-style-type: none"><li>• United Nations Framework Convention on Climate Change (2007). Climate Change; Impacts Vulnerabilities and Adaptations in Developing Countries. <a href="http://www.preventionweb.net/publications/view/2759">http://www.preventionweb.net/publications/view/2759</a></li><li>• Waugh, D. (1990). Geography: An Integrated Approach. Nelson: London.</li></ul>
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## **Social sciences and humanities module Course syllabi**

**Course Title:** Social Anthropology

**Course Code:** Anth 1012

**Module name:** Social sciences and humanities module

**Module code:** Sshm-M1024

**Course ECTS:** 5 ECTS

**Year/Semester Course is offered:** Year I Semester II

**Contact hours/ week:** 135

Lecture	48 hrs
Tutorial and Problem Solving	10 hrs
Group Discussion	20 hrs
Assessment	8 hrs
Presentation	14 hrs
Home Study	35 hrs
Total	135 hrs

**Prerequisite course:** None

### **Course Description:**

Dear Learner! Welcome to this course, Anth101. The course is expected to acquaint you with essential concept of anthropology covering a wide array of questions revolving around our very existence. It cover issues such as what makes human beings similar to each other? How do we differ one another? What do anthropologist mean when they talk about diversity, multiculturalism, marginalization, inclusion and exclusion?

The course will enable learners grasp the different ways of being human by dealing with themes such as culture, kinship, marriage, cultural relativism, ethnocentrism, humanity, human origins, cosmologies, race, ethnicity, ethnic relations, ethnic boundaries, marginalization, minorities, local systems of governance, legal pluralism, indigenous knowledge systems, and indigenous practices and development.

### **Course Objectives:**

p on the successful completion of the course, students will be able to:

- ✓ Develop an understanding of the nature of anthropology and its broader scope in making sense of humanity in a global perspective;
- ✓ Understand the cultural and biological diversity of humanity and unity in diversity across the world and in Ethiopia;
  - ✓ Analyze the problems of ethnocentrism against the backdrop of cultural relativism;
- ✓ Realize the socially constructed nature of identities & social categories such as gender, ethnicity, race and sexuality;

- ✓ Explore the various peoples and cultures of Ethiopia;
- ✓ Understand the social, cultural, political, religious & economic life of different ethno-linguistic & cultural groups of Ethiopia;
  - ✓ Understand different forms marginalization and develop skills inclusiveness;
  - ✓ Appreciate the customary systems of governance and conflict resolution institutions of the various peoples of Ethiopia;
  - ✓ Know about values, norms and cultural practices that maintain society together;
  - ✓ Recognize the culture area of peoples of Ethiopia and the forms of interaction developed over time among themselves; and

Develop broader views and skills to deal with people from a wide variety of socio-economic and cultural backgrounds

### **Course learning and teaching methods**

The teacher or course facilitator who is assigned to deliver is recommended to make use of different active learning methods including: brainstorming, question and answer, group discussion, buzz-group, cross-over, home-works, reading assignments, peer teaching, and seldom active lecturing.

### **Assessment Method:**

To assess the progress of student, the instructor/ the course facilitator is expected to employ a continuous assessment technique in the form of quizzes, group and individual assignments, take-home exam, final exam, term paper. The purpose of using various assessment techniques is to improve the process of students' learning.

## **Contents**

### **Chapter one**

## **1. Introducing Anthropology and its Subjects**

### **What is anthropology – a Mirror for Humanity?**

- ✓ Sketching the subject matter, scope and concerns of anthropology
- ✓ Anthropological imagination: asking questions and seeing the world anthropologically.
  - **Q-** What does it mean by using the anthropological lens when looking at the world?
- ✓ Defining Features of Anthropology- holism, relativism & comparative perspectives
- ✓ Methods of Research in anthropology: ethnography & ethnographic methods

### **Sub-fields of Anthropology: Four Mirrors for Understanding Humanity**

The relation between anthropology and other disciplines

## Chapter Two

### 2. Human Culture and Ties that Connect

**Conceptualizing Culture:** What Culture Is and What Culture Isn't?

Characteristics features of culture: what differentiates culture from other traditions?

Aspects of Culture –Material & Non-material (values, beliefs & norms)

Levels of culture: universality, generality and particularity (cultural diversity)

Ethnocentrism, Cultural relativism, and human rights

- **Discussion-** Debating cultural relativism: Human rights law and the demonization of culture and anthropology along the way

Cultural Change: what is cultural change?

- ✓ Cultural Diffusion versus Cultural Assimilation
- ✓ Innovation
- **Discussion** - Contesting culture as sharply bounded versus unbounded 'cultural flows' or as 'fields of discourse' in the context of globalization.

**Ties that Connect:** Marriage, Family and Kinship

- ✓ Marriage -rules, functions and forms of Marriage
- ✓ Family -types and functions of Family
  - **Q.** How families and marriage differ in different societies?
- ✓ Kinship System -types of kin groups and rules of descent
- ✓ Kinship and Gender Across Cultures
  - ✚ Sex and Gender: Mapping differences in cross cultural perspective
  - ✚ Gender –as power relations

Cultural practices, norms and values that maintain society together

## Chapter Three

### 3. Human Diversity, Culture Areas, and Contact in Ethiopia

Human Beings & Being Human: What it is to be human? –(a bio-cultural animal?)

Origin of the Modern Human Species: Homo sapiens sapiens (that's you!)

- ✓ Religious, biological & evolutionary (paleo-anthropological) explanations

The Kinds of Humanity: human physical variation

- **Q.** Why isn't everyone the same?
- **Q.** Why do people worldwide have differences in their phenotypic attributes?

Human Races: the history of racial typing

- ✓ The Grand Illusion: Race, turns out, is arbitrary
  - **Q.** What can we say for sure about human races?

Why is Everyone Different? Human Cultural Diversity - anthropological

explanations

- **Q.** Why don't others do things the way we/I do?

Culture areas and cultural contacts in Ethiopia

Plough culture area

*Enset* culture area

Pastoral societies culture area

Historical and social interactions between culture areas

## Chapter Four

### 4. Marginalized, Minorities, and Vulnerable Groups

Gender based marginalization

Occupational cast groups

Age based vulnerability (children and old age issues)

Religious and ethnic minorities

Human right approaches and inclusive growth, anthropological perspectives

## Chapter Five

### 5. Theories of inter-ethnic relations and multiculturalism in Ethiopia

The Scales of Human Identity: Who am I?-

Understanding 'self' & 'other'

- **Q-** What are the ways we tell for others who we are?

Ethnicity and Race: What's in a name?

Ethnic Groups & Ethnic Identity

- **Q.** What is the basis of one's ethnic identity?
- **Q.** Is ethnicity a fundamental aspect of human nature & self-consciousness, essentially unchanging and unchangeable identity? Or
- **Q.** Is it, to whatever extent, socially constructed, strategically or tactically manipulable, and capable of change at both the individual and collective levels?

Race –the social construction of racial identity

- **Q.** Do the claims of some people/groups about superior & inferior racial groups have any scientific validity?

Primordialism; Instrumentalism; Social constructivism

Debates on inter-ethnic relations and identities

## Chapter Six

### 6. Customary and local governance systems and peace making

Indigenous knowledge systems and local governance

Intra and inter-ethnic conflict resolution institutions

**Ethnographic cases:** commonalities and shared practices (e.g., Oromo and Somali, Afar and Tigray; Gedeo and Oromo; Guraghe and Siltie; Amara and Tigray)

Customary/Local governance systems

**Ethnographic cases:** Oromo Geda; Somali-Gurti;  
Gamo, Gofa, Wolayita-Woga;Guraghe-Sera

Legal pluralism: interrelations between customary, religious and state  
legal systems

❖ **Assessment and Evaluation Criteria:**

Based on the progressive understandings of the course, students will be evaluated continuously through both non-graded assignments/activities, like (reading assignments) and graded assignments/activities and assessments including class discussion & participation, Test, Term Paper & presentation, Home Taken Exam/case studies and Final Exam.

**V. Suggested readings:**

1. Asmarom Legesse (2006). Oromo Democracy: an Indigenous African Political System. The Red Sea Press, Inc.
2. Cameron, M. Smith and Evan T. Davies (2008). Anthropology for Dummies. Wiley Publishing, Inc., Indianapolis, Indiana.
3. Clifford Geertz . (1973). The Interpretation of Cultures. A division of Harper Collins Publishers.
4. Donald Donham . (1986). Marxist Modern. The Ethnographic History of Marxist Ethiopia.
5. Donald N. Levine. (1974). Greater Ethiopia: The Evolution of A Multiethnic Society. Chicago & London., University of Chicago.
6. Dunif-Hattis and Howard C. (1992). Anthropology: Understanding Human Adaptation. New York: Harper Collins, Inc.
7. Eriksen, T. H. (2001). Small Places, larger Issues: An introduction to social and cultural anthropology. London: Pluto Press.
8. Eriksen, T. H. (2004). What is anthropology? London: Pluto Press.
9. Eriksen, T. Hylland. (2002). Ethnicity and Nationalism. London; Pluto Press.
10. Eriksen, T.H. and Nielsen, F.S. (2001). A History of Anthropology. London: Pluto Press.
11. Hallpike, Christopher R. (1972). The Konso of Ethiopia: A Study of the Value of a Cushitic People. Oxford: Clarendon Press.
12. Hamer, John. (1970). The Sidama Generational Class Cycles: A Political Gerontocracy. Africa 40, I (Jan, 1970): 50-70.
13. Haviland, WA, (1999). Cultural Anthropology (9<sup>th</sup> ed.). Fort Worth: Harcourt and Brace College Pub.
14. Kottak, C. P. (2004) – Anthropology: the Exploration of

- Human Diversity (10<sup>th</sup> ed.). McGraw Hill, New York.
15. Lavenda, R. and Emily S. (2015). *Anthropology. What Does It Mean to Be Human?* (3<sup>rd</sup> ed.). Oxford. Oxford University Press.
  16. Pankhurst. R. (2001). *Historic Images of Ethiopia*. Shamans Books. Addis Ababa, Ethiopia.
  17. Richard Jenkins. (2006). *Rethinking Ethnicity*. London Sage Publication.
  18. Rosman, A., Rubel, P.G. and Weisgrau, M. (2009). *The Tapestry of Culture: an Introduction to Social Anthropology*. Lanham: Rowman and Little field.
  19. Scupin and DeCorse (1988). *Anthropology: A Global Perspective* (2<sup>nd</sup> ed.). New Jersey: Prentice Hall.
  20. Shack, William S. (1966). *The Gurage: A People of the Enset Culture*. London: Oxford University Press.
  21. Triulzi et al. (2002). *Remapping Ethiopia Easer African Studies*:. Addis Ababa: AAU

**Course Title:** Moral and Civic Education

**Course Code:** CvEd 1022

**Module name:** Social sciences and humanities module

**Module code:** Sshm-M1024

**Course ECTS:** 3 (81 hrs)

**Year/Semester Course is offered:** Year I Semester II

**Contact hours/ week:** 2

**Prerequisite course:** None

**Course Description:**

As the Ethiopian Education Development Roadmap (2018-30) stated that, since one of the challenges for quality education is missing the proper moral and civic education, the education policy objectives should be revisited and formulated to reflect the creation of holistic development in all citizens, confident and competent citizens, critical thinkers, competent professionals who satisfy the requirements of the global market; entrepreneurs and innovative, strong ethical and moral values, stand for justice; peace, and unity in diversity.

The benchmarking moral, ethical and citizenship education are part of the curriculum of the educational system to address diversity and national unity. The education system should promote these realities and be able to produce adequate and capable graduates to satisfy both the domestic and global markets.

Given this, the Ethiopian government has designed and implemented moral and civic education curricula to aim at educating students about democratic culture, ethical values



and principles, supremacy of constitution, and the rule of law and so on. These elements are imperative in the process of producing self-confident citizens and a generation who has the capability to shoulder responsibility. Accordingly, this module is basically aspires to equip the learners with relevant knowledge, respect for the worth and human dignity of every individual, right attitudes and requisite skills to enable them perform their roles as a credible members of their society. Through the module, learners will also acquire nature of Ethiopian federalism and parliamentary system of government, ways of making responsible decisions, solve problems, care about others, contribute to society, and be tolerant and respectful of diversity.

This module is organized into five chapters. The first chapter deals with the definition of concepts and terms, differences between civics and ethics, goals of civics and ethics as well as competences of a good citizen. The second chapter presents the major rival theories and perspectives on ethics and morality. The third chapter dwells with ethical decision making and the justification behind the moral judgments, while chapter four contains about the concepts of citizenship, state and government particularly the state structures and theories of state, systems of government, theories of citizenship, ways of acquiring and losing citizenship and the interplay between citizens, state and government and final fifth chapter deals with constitution, human rights and democracy.

### **Course Objectives:**

After the successful completion of this module students will be able to:

- Conceptualize what morality, ethics and civics mean.
- Comprehend the goals of civics and ethics as well as the competences of a good citizen.
- Discuss the relations between society, state and government.
- Differentiate federal state structure from unitary and discuss the advantages and disadvantages of the state structures.
- Discuss the processes of modern Ethiopian state formation and nation building.
- Comprehend the features of Ethiopian federalism.
- Conceptualize constitution, its classification and unique features.
- Define the term human rights, the unique features and its classifications.
- Differentiate the teleological, deontological and virtue theories.

### **Course learning and teaching methods:**

The mode of the delivery of the course includes lecture, tutorials, home study, group discussions, intensive readings, role play and class debates, independent assignments. Based on these methodologies of teaching, the course should have highly participatory that helps students to develop habits of critical thinking, inquisitive, critical, analytic, integrative and morally balanced student, and exhibits higher ethical standards like open-mindedness, rational thinking, evidence-oriented personality and problem solving skills.

**Assessment Method:**

Evaluation will be made based on continuous assessment (50%) and final exam (50%) results. The continuous assessment comprises group and individual assignments, presentation, class attendance and participation, and quizzes. In all kinds of assessments students are expected to clearly demonstrate their horizon of thinking, rational reasoning proper use of language by ensuring clear, effective and meaningful communication.

**Continuous assessment**

Group assignment with presentation .....	20%
Quiz I Day 2 .....	10%
Quiz II Day 5 .....	10%
Quiz III Day 10 .....	10%
Quiz IV Day 12 .....	10%
Final exam Day 18.....	40%

**Competence to be measured:**

(Knowledge, skill and attitude)

- Describing key concepts like civics, ethics, democracy, profession and so on; institutions, policies, strategies and legal provisions of the country;
- Explaining their rights and duties as well as governments’ rights over them and duties towards them.
- Demonstrating their understanding of government institutions, policies, strategies and legal provisions of their country

**Teachers and Students Role**

**References:**

1. Assefa Fiseha (2005) *Federalism and the Accommodation of Diversity in Ethiopia: A Comparative Study*, Netherlands, Wolf Legal Publishers.
2. Bayles, Michael (1989). *Professional Ethics*. 2d ed. Belmont, Calif : Wadsworth.
3. Bahru Zewde, (1991), *A History of Modern Ethiopia: 1855-1974*. Addis Ababa: AUU Press.
4. Clapham, C., *Haile-Sellasié's Government*, (London: Longman, 1969).
5. Fasil Nahum (1997), *Constitution for a Nation of Nations: The Ethiopian Prospect*. Asmara: The Red Sea press.
6. Johari, J.C (1987) *Contemporary Political Theory: New Dimensions, Basic Concepts and major Trends*. New Delhi: Sterling publishers Put. Ltd.
7. Kassahun Berhanu (1998) 'Democracy, State-Building and Nations in Ethiopia: 1974-1995.' In Gros, Jean- Germain (ed.) *Democratization in Late Twentieth-Century Africa coping with Uncertainty*.
8. Merera Gudina, (2003) *Ethiopia: Competing Ethnic Nationalities and the Quest for Democracy, 1960-2000*. Chamber printing house: Addis Ababa
9. Tesfaye Molla (2010) *Civics and Ethics Distance Learning Material*, Hawassa University, Department of Governance and Development Studies.
10. Tsegaye Regassa, (2001). *Ethnic Federalism and The Right to Self-Determination As A Constitutional Legal Solution to the Problem of Multi-Ethnic Societies: The Case of Ethiopia* (LLM Thesis, Ethiopian Civil Service College, Law Library, Unpublished) Policy/legal Documents
11. The Federal Democratic Republic of Ethiopia Constitution of 1995 Proclamation No. 1/1995, 21<sup>st</sup> August, 1995, adopted on 8<sup>th</sup> of December

**Course Schedule:**

<b>Days</b>	<b>Contact Hrs</b>	<b>Topic to be discussed</b>	<b>Reading assignment</b>	<b>Guided study questions</b>
Day 1	4 hrs (morning)	First class meeting General introduction about the course, and setting ground rules  Chapter One: Civics and Ethics for Professionals Conceptualizing Citizenship and Morality; Civics and Ethics: meaning; Definition; Why Civics and Ethics?;Historical Development of Civics and Ethics in Ethiopia, Sources of civics and ethics, goals of civics and ethics.	Bayles (1989), pp1-6 <i>Civics and Ethics Teaching Material</i> , Module , Chapter One, pp 1-9	After introducing students the objectives of learning civics and ethics they attempt to address the questions: What do we mean by <i>Civics and Ethics</i> ? What about by <i>morality</i> ?? <i>Why</i> you take this course?
	2 hrs (afternoon)	Profession and Professional Ethics in Ethiopia; What is profession; and who are professionals?  Distinguishing Features of profession	Bayles (1989), pp 6-18 <i>Civics and Ethics Teaching Material</i> , Module , Chapter One, pp 9-29	Students reflect on the meaning of profession, and elements that are to be considered in defining profession  Identifying the distinguishing features of profession; and enumerating the attributes of ethical and moral principles of profession will be made by students
Day 2	½ hrs (morning)	Quiz-I		

	2 hrs (morning)	CHAPTER TWO Perspectives on Society, state and government, Definition and essential elements of state, theories on the origin of state	<i>Teaching Material</i> , Module Johari, J.C (1987), pp 1-20 The 1933 Montevideo Convention on the Rights and Duties of States <i>Civics and Ethics Teaching Material</i> , Module , Chapter Two, pp 30-34	Students reflect on the meaning of, Society, state and government and the triangular relationship among them. Students describe the elements of modern state and reflect views on theories on the origin of state.
	4 hrs (afternoon)	Structures of State, Forms of Government	<i>Teaching Material</i> , Module , Chapter Two, pp 34-44	Identify the two structures of state. Compare and contrast the structures of state in Ethiopian context. Reflect view on the different forms of government, emphasis on parliamentary and presidential systems as well as sovereignty.
Day 3	3 hrs	Tutorial-I		
Day 4	4hrs (morning)	Society, State and Government in Ethiopia.	<i>Civics and Ethics Teaching Material</i> , Module , Chapter Two, pp 44-73 Johari, J.C (1987), pp 1-20 The 1933 Montevideo Convention on the Rights and Duties of States	Reflect view on the form and structure of the successive Governments of Ethiopia Discuss the state-society relations of successive governments of Ethiopia Students reflect their views on rationales and dynamics of federalism in Ethiopia.
		Chapter Three: Citizenship, Patriotism and civic Participation.	<i>Civics and Ethics Teaching Material</i> , Module , Chapter Three, pp 74-89	Students understand the concepts of citizen and citizenship; Discuss on the historical survey of citizenship; Explain the aspects of citizenship; Know ways of acquiring and losing citizenship;

		Definition of Citizenship, Historical survey of Citizenship, aspects of Citizenship, qualifications for citizenship: ways of acquiring and loosing citizenship		
	4hrs (afternoon)	The rights and Duties of Citizens, Citizenship and Patriotism in the Ethiopian Context, Civic Participation.	<i>Civics and Ethics Teaching Material</i> , Module , Chapter Three, pp 89-112 FDRE constitution (Articles 13 -44), Protections of Nationality under the 2003 Nationality Proclamation Articles 14-17) Criminal Code of Ethiopia (Arts 561-600	To assess students' ability to know their rights and duties as well as governments' rights over them and duties towards; identify their responsibilities towards their community. Explain the concept of patriotism and its linkage with citizenship Describe the forms and forums of civic participation
Day 5	½ hr (afternoon)	Quiz-II		
Day 6 & 7	1 <sup>st</sup> Week Break			
Day 8	3 hrs	Tutorial-II		

Day 9	4hrs (morning)	CHAPTER FOUR: Democracy and Good Governance in Ethiopia Definition and the Historical Survey of Democracy, Forms and Types of democracy	<i>Civics and Ethics Teaching Material</i> , Module , Chapter Four, pp 113-116	Students reflect their views on the concept and meaning of democracy; Describe the forms and types of democracy
		Fundamental principles and values of democracy, Actors in the democratization process	<i>Civics and Ethics Teaching Material</i> , Module Chapter Four, pp 116-133 FDRE constitutions , basic principles of the constitution, (Articles 8-12)	List down the basic fundamental values and principles of democracy; Evaluate the role of different actors in the democratization process
	4hrs (afternoon)	Democracy and good governance in the context of Africa and Ethiopia.	<i>Civics and Ethics Teaching Material</i> , Module , Chapter Four, pp 133-137 Johari, J.C (1987 ) pp95-122	After introducing the foundations of democracy in general, students reflect their views on foundations of democracy in Africa and Ethiopia; attributes of good governance, the conditions required for a political system to qualify as a democracy
Day 10	½ hrs (afternoon)	Quiz-III		
Day 11	3hrs (morning)	Tutorial-III		

	4hrs (afternoon)	Chapter five: Constitution and constitutionalism Definition of constitution, definition of constitutionalism, purposes and classification of constitution, Contents and validity of constitution,	<i>Civics and Ethics Teaching Material</i> , Module Chapter five, pp 138-146	Students identify the basic features of constitution and constitutionalism; list the major purposes and function of constitution; appreciate why countries need to have constitution; distinguish modern classification of constitutions; describe the contents and validity of constitution
		The Constitutional Experience of Ethiopia, the pre-1931 traditional constitutional experience, The 1931 Constitution, The 1955 Revised Constitution.	<i>Civics and Ethics Teaching Material</i> , Module , Chapter Five, pp 146-153 The 1931 constitution, the Revised 1955 Constitution	The students evaluate the major achievements of traditional constitution of Ethiopia; explain the motives and progressive political elements of the 1931 and the 1955 Ethiopian constitution; compare the 1931 and the 1955 revised constitution.
Day 12	½ hr (afternoon)	Quiz IV		
13-14	2 <sup>nd</sup> Week Break			
Day 15	3hrs (morning)	Tutorial-IV		
	4hrs (afternoon)	The 1987 PDRE Constitution, the Transitional Charter of 1991, The 1995 FDRE Constitution.	<i>Civics and Ethics Teaching Material</i> , Module , Chapter Five, pp 153-163 The 1987 PDRE constitution and The 1995 FDRE constitution.	The students reflect their views on the salient features of the 1987 PDRE constitution; 1991 Transitional Charter and 1995 FDRE constitution; Compare and contrast the ideological basis of Ethiopian constitutions under the three successive regimes.



Day 16	4hrs (morning)	CHAPTER SIX : Globalization Introduction, Globalization and the changing world, dimensions and values of globalization, major actors of globalization.	<i>Civics and Ethics Teaching Material</i> , Module , Chapter Six, pp 164-180 Douglas, S., and Y. Wind (1987) <i>The Myth of Globalization</i> . NY: www.ingentaconnect. com/content/mcb/036/2001 .	Identify the major value cracks which are believed to supply the ever worsening value crises over work as a spiritual and material source of ethical problems in Ethiopia.
	4 hrs (afternoon)	Challenges of globalization in developing countries, Ethiopia; a state in a globalized world, Global citizenship	<i>Civics and Ethics Teaching Material</i> , Module, Chapter Six, pp 180-187 Swann, D. (1999) <i>The Economics of the Common Market</i> , 6th ed., London: Penguin Books	Reflect views on the meaning by globalization and its drivers
Day 17		One day break for final exam preparation		

**Course Title:** Mathematics for Natural Sciences

**Course Code:** Math 1011

**Module name:**

**Module code:**

**Course ECTS:** 5

**Year/Semester Course is offered:** Year I Semester I

**Contact hours/ week:** 135

### **Content Page**

#### **Chapter 1:** Propositional Logic and set Theory

##### 1.1. Propositional Logic

###### 1.1.1 Definition and examples of Propositions

###### 1.1.2 Logical connectives

###### 1.1.3 Compound (or complex) proposition

###### 1.1.4 Tautology and contradiction

##### 1.2. Open propositions and quantifiers

##### 1.3. Arguments and Validity

##### 1.4. Set Theory

###### 1.4.1 The Concept of a set

###### 1.4.2 Description of sets

###### 1.4.3 Set operations and Venn diagrams

#### **Chapter 2:** The Real and Complex Number Systems

##### 2.1 The real number system

###### 2.1.1 The natural numbers, principle of mathematical induction and the well ordering axiom

###### 2.1.2 The set of integers

###### 2.1.3 The set of rational numbers

###### 2.1.4 The set of real numbers, upper bound and lower bound, least Upper bound and greatest lower bound; completeness property of real numbers

##### 2.2 The set of complex numbers

###### 2.2.1 Plotting complex numbers

###### 2.2.2 Operations on complex numbers

###### 2.2.3 Conjugate of a complex number

###### 2.2.4 Modulus (Norm) of a complex number

###### 2.2.5 Additive and multiplicative inverse

###### 2.2.6 Argument of a complex number

###### 2.2.7 Polar form of a complex numbers

2.2.8 Extraction of roots

### **Chapter 3: Functions**

3.1 Review of relations and functions

3.2 Real valued functions and their properties

3.3 Types of functions and inverse of a function

3.4 Polynomials, zeros of polynomials, rational functions and their graphs

3.5 Definition and basic properties of logarithmic, exponential, trigonometric and hyperbolic functions, and their graphs

### **Chapter 4: Analytic Geometry**

4.1 Distance Formula and Equation of Lines

4.1.1 Distance between two points and division of segments

4.1.2 Equations of lines

4.1.3 Distance between a point and a line

4.2 Circles

4.2.1 Definition of a circle

4.2.2 Equation of a circle

4.2.3 Intersection of a circle with a line and tangent line to a circle

4.3 Parabolas

4.3.1 Definition of parabola

4.3.2 Equation of parabolas

4.4 Ellipse

4.4.1 Definition of ellipse

4.4.2 Equation of ellipse

4.5 Hyperbola

4.5.1 Definition of a hyperbola

4.5.2 Equation of a hyperbola

4.6 The general second degree equation

4.6.1 Rotation of coordinate axes

4.6.2 Analysis of the general second degree equations

### **References**

Alemayehu Haile and Yismaw Alemu, *Mathematics an Introductory Course*,  
Department of Mathematics, Addis Ababa University

2. Demisu Gameda and Seid Mohammed, *Fundamental Concepts of Algebra*, AAU

3. Semu Mitiku Kassa, Berhanu Guta Wordofa and Tilahun Abebaw Kebede, *Engineering Mathematics I*, Galaxy University Books Series, , 2017.

4. Edwin J. Purcell, Dale Varberg, *Calculus with Analytic Geometry*

5. G. Chartrand, A. D. Polimeni and P. Zihang, *Mathematical proofs: a transition to advanced mathematics* 3rd edition, Pearson Education. Inc.

6. Goodman Hirsch, *Precalculus-Understanding functions*, 2000

7. James Ward Brown and Ruel V. Churchill: *Complex Numbers and Applications*, 7th edition

8. Michael D. Alder: An Introduction to Complex Analysis to Engineers, 1997

**Course Title:** General Physics

**Course Code:** Phyc-1011

**Module name:**

**Module code:**

**Course ECTS:** 5 ECTS

**Year/Semester Course is offered:** Year I Semester I

**Contact hours/ week:** 135

Course Information	
Course code	Phys1011
Course Title	General Physics
Module	General physics
ETCTS Credits	5
Contact Hours (per week)	3
Course Objectives	<p>By the end of this course the student will able to:</p> <ul style="list-style-type: none"><li>• Develop knowledge and skills in basic measurement and uncertainty.</li><li>• Understand the basic concepts of physics and the relations between them (Laws).</li><li>• Describe and explain natural phenomena using the basic concepts and laws.</li><li>• Apply the basic concepts and laws to practical situations.</li><li>• Develop the algebraic skills needed to solve theoretical and practical problems.</li><li>• Appreciate the applicability of physics to a wide range of disciplines.</li></ul>
Course Description	<p>This algebra based course provides science students with the basic concepts of physics that enable them to understand describe and explain natural phenomena. Emphasis is laid on general principles and fundamental concepts in measurements, mechanical and thermal interactions, fluid mechanics, electromagnetism, oscillations and waves with applications of physics in various fields of science.</p>

	<p>The course is organized into 7 chapters. The chapters on mechanics introduce the principles and laws governing the motion of objects and the interaction between the mass well as conservation laws. The chapter on heat and temperature discusses the interaction between systems through energy transfer and describes some basic thermal properties of such systems. The chapters on oscillations, waves and optics provide basic concepts of periodic motions, how waves transfer energy from one place to the other, and use the concepts of light rays to explain image formation by mirrors and lenses. Electromagnetism and electronics introduces the basic electric and magnetic phenomena using the concept of field and treats elementary concepts of semiconductors. Cross-cutting applications of physics explain the roles of physics in Agriculture, Industries, Medicine, Archeology, Power Generation, Earth and Space Sciences.</p>	
WEEKS	Course Contents	Reading
1 <sup>st</sup>	<b>Preliminaries</b> <ul style="list-style-type: none"> <li>❖ Physical Quantities and Units of Measurement</li> <li>❖ Uncertainty in Measurement and significant digits</li> <li>❖ Vectors: composition and Resolution</li> <li>❖ Units of Vector</li> </ul>	
2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> and 5 <sup>th</sup>	<b>Kinematics and dynamics of practice</b> <ul style="list-style-type: none"> <li>❖ Kinematics in one and two dimensions</li> <li>❖ Particle dynamics and planetary motion</li> <li>❖ Work, Energy and linear momentum</li> </ul>	
6 <sup>th</sup> , and 7 <sup>th</sup>	<b>Fluids Mechanics</b> <ul style="list-style-type: none"> <li>❖ Properties of Bulk Matter</li> <li>❖ Density and pressure in static fluids</li> <li>❖ Buoyant Force, Archimedes Principle</li> <li>❖ Moving Fluids and Bernoulli's Equation</li> </ul>	
8 <sup>th</sup> and 9 <sup>th</sup>	<b>Heat and thermodynamics</b> <ul style="list-style-type: none"> <li>❖ The Concept of Temperature</li> <li>❖ The Concept of Heat and Work</li> <li>❖ Specific Heat and Latent Heat</li> <li>❖ Heat Transfer Mechanism</li> <li>❖ Thermal Expansion</li> <li>❖ Energy Conservation</li> </ul>	

10 <sup>th</sup> and 11 <sup>th</sup>	Oscillations, Wave and Optics <ul style="list-style-type: none"><li>❖ Simple Harmonic Motion</li><li>❖ Simple Pendulum</li><li>❖ Wave and its Characteristics</li><li>❖ Resonance</li><li>❖ Doppler Effect</li><li>❖ Image Formation by thin lenses and</li></ul>	
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	<b>Mirrors</b>																								
12 <sup>th</sup> and 13 <sup>th</sup>	<p>Electromagnetism and Electronics</p> <ul style="list-style-type: none"> <li>❖ Coulombs' Law and Electric fields</li> <li>❖ Electric Potential</li> <li>❖ Current, Resistance and Ohm's law</li> <li>❖ Equivalent Resistance and Kirchoff's law</li> <li>❖ Magnetic field and magnetic flux</li> <li>❖ Electromagnetic Induction</li> <li>❖ Insulators, Conductors and semiconductors</li> <li>❖ Diodes, Characteristics of Curve</li> <li>❖ Transistors</li> </ul>																								
14 <sup>th</sup> , 15 <sup>th</sup> and 16 <sup>th</sup>	<p>Cross Cutting Applications of Physics</p> <ul style="list-style-type: none"> <li>❖ Application in Agriculture</li> <li>❖ Physics and Industry</li> <li>❖ Physics in Health Science and Medical Imaging</li> <li>❖ Physics and Archeology</li> <li>❖ Application in Earth and Space science</li> <li>❖ Application in power Generation</li> </ul>																								
Teaching & Learning Methods/strategy	The teaching and learning methodology include lecturing, discussions, problem solving, and analysis. The full and active participation of students is highly encouraged.																								
Assessment/Evaluation	The evaluation scheme will be as follows:																								
	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th>Test 1</th> <th>Test 2</th> <th>Test 3</th> <th>Quiz</th> <th>Assignment</th> <th>Final</th> <th>Total</th> </tr> <tr> <td>10%</td> <td>10%</td> <td>15%</td> <td>5%</td> <td>10%</td> <td>50%</td> <td>100%</td> </tr> </table>	Test 1	Test 2	Test 3	Quiz	Assignment	Final	Total	10%	10%	15%	5%	10%	50%	100%										
Test 1	Test 2	Test 3	Quiz	Assignment	Final	Total																			
10%	10%	15%	5%	10%	50%	100%																			
Work load in hours	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <th colspan="7">Hours Required</th> <th rowspan="2">Total Hrs</th> </tr> <tr> <th>Lectures</th> <th>Lab</th> <th>Assessments</th> <th>Tutorials</th> <th>Self-Studies</th> <th>Assignment</th> <th>Advising</th> </tr> <tr> <td>48</td> <td>-</td> <td>12</td> <td>-</td> <td>60</td> <td>15</td> <td>-</td> <td>135</td> </tr> </table>		Hours Required							Total Hrs	Lectures	Lab	Assessments	Tutorials	Self-Studies	Assignment	Advising	48	-	12	-	60	15	-	135
Hours Required							Total Hrs																		
Lectures	Lab	Assessments	Tutorials	Self-Studies	Assignment	Advising																			
48	-	12	-	60	15	-	135																		
Roles of the Instructor	He/she will come to the class regularly on time and deliver the lecture in a well-organized manner. Besides, he/she is responsible to give feedback for each assessment.																								



Roles of the students	The success of this course depends on the students' individual and collective contribution to the class discussions. Students are expected to participate voluntarily, or will be called upon, to contribute to set exercises and problems. Students are also expected to read the assigned
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	<p>readings and prepare the cases before each class so that they could contribute effectively to class discussions. Students must attempt assignments by their own. Proficiency in this course comes from individual knowledge and understanding. Copying the works of others is considered as serious offence and leads to disciplinary actions.</p>
<p>Text and Reference Books</p>	<p><u>Reference Books</u></p> <p>Serway, R. A. and Vuille, C., 2018, College Physics, 11th ed., Cengage Learning, Boston, USA</p> <p>University Physics with Modern Physics by Young, freedman and Lewis Ford</p> <p>Physics for Scientists and Engineers with Modern Physics by Douglas C. Giancoli</p> <p>Fundamentals of physics by David Halliday, Robert Resnick and Gearl Walker</p> <p>College Physics by Hugh D. Young Sears Zemansky, 9th edition</p> <p>Herman Cember and Thomas A. Johnson, Introduction to Health Physics, 4<sup>th</sup> ed., (2008).</p> <p>William R. Hendee and E. Russell Ritenour, Medical Imaging Physics, 4th ed., (2002).</p> <p>Tayal D.C. <i>Basic Electronics</i>. 2nd ed. Himalaya Publishing House Mumbai, (1998).</p> <p>Theraja B.L., R.S. Sedha. <i>Principles of Electronic Devices and Circuits</i>, S.Chand and Company Ltd, New Delhi, (2004).</p> <p>Introduction to Space Physics, M. G. Kivelson and C. T. Russell, Cambridge University Press, 1995.</p> <p>Stacey, Frank D.: <i>Physics of the earth</i>. 2nd Ed.,Wiley, 1977.</p>

**Course Title:** Physical Fitness

**Course Code:** SpSc-1011

**Module name:**

**Module code:**

**Course ECTS:** NC

**Year/Semester Course is offered:** Year I Semester I

**Contact hours/ week:**

<b>Course Information</b>	<b>Course name: Physical fitness</b> <ul style="list-style-type: none"><li>• <b>Course eligibility: All first year undergraduate students</b></li></ul>
<b>Course Description</b>	This course will provide the students with basic concepts of the five components of health related physical fitness (cardiovascular, muscular strength and endurance, flexibility, and body composition), conditioning, hypokinetic disease and general principles of training. It is mainly practical oriented. As a result, the students will be exposed to various exercise modalities, sport activities, minor and major games, and various training techniques as a means to enhance health related physical fitness components. In addition, they will develop the skills to assess each component of fitness and will practice designing cardiovascular, muscular strength and endurance, and flexibility programs based on the fitness assessment. The course serves as

	an introduction to the role of exercise in health promotion, fitness, performance including the acute and chronic responses of the body to exercise.
<b>Expected learning outcomes</b>	<p>By the end of this course the students will be able to:</p> <ol style="list-style-type: none"> <li>1. Recognize the immediate and long term responses of the body to various types of exercise.</li> <li>2. Understands the basic concepts of physical fitness and conditioning exercises.</li> <li>3. Understand the concept of hypokinetic disease and conditions.</li> <li>4. Distinguish the general principles of fitness training</li> <li>5. Develop conditioning programs to enhance the components of health related physical fitnesses.</li> <li>6. Participate in conditioning programs which may help to develop the components of health related physical fitnesses.</li> <li>7. Understand health issues in relation to excess body fatness and excessively low body fat.</li> <li>8. Develop skills to assess health related physical fitness components.</li> <li>9. Develop healthy body weight management skill.</li> <li>10. Appreciate and value the benefits of regular physical exercise to healthy living.</li> <li>11. Develop interest to engage in a regular physical exercise program as a life time activity.</li> <li>12. Develop self-confidence and effective communication skills in and out of the school environment.</li> </ol>

### **Course Calendar and Delivery**

<b>Date /week</b>	<b>Key Topics</b>	<b>Teaching Method</b>
<b>Week - 1</b>	<p><b>Chapter 1- Concepts of physical fitness and conditioning</b></p> <p>Meanings and definitions of terms</p> <p>physical fitness</p> <p>physical conditioning</p> <p>Physical Activity,</p> <p>Physical exercise and</p> <p>Sport</p>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Group discussion</li> <li>• Questioning and answering</li> </ul>

	1.2. General principles of fitness training	
<b>Week -2</b>	<b>Chapter 2- The Health Benefits of Physical Activity</b> Physical Activity and Hypokinetic Diseases/Conditions Physical Activity and Cardiovascular Diseases physical activity and postural deformity	Lecture  Group discussion  Questioning and answering
<b>Week - 3</b>	<b>Chapter 3 - Making Well-Informed Food Choices</b> Sound Eating Practices Nutrition and Physical Performance	Lecture  Group discussion  <ul style="list-style-type: none"> <li>• Questioning and answering</li> </ul>
<b>Week 4 &amp; 5</b>	<b>Chapter 4- Health related components of fitness</b> <b>Cardiovascular fitness</b> Meaning and concepts of cardiovascular fitness 2.1.2.Means and methods of developing cardiovascular fitness <b>Muscle fitness</b> Meaning and concepts of muscle fitness 2.1.2.Means and methods of developing muscle fitness <b>Flexibility</b> Meaning and types of flexibility 2.1.2. Means and methods of developing flexibility <b>Body composition</b> Meaning of body composition Health risks associated with over fatness 2.4.3.Health risks associated with excessively low body fatness	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Group discussion</li> <li>• Presentation</li> </ul>
<b>Week - 6</b>	<b>Chapter 5- Assessment of fitness components</b> Assessment of cardiovascular fitness Assessment of muscle fitness Assessment of flexibility Assessment of body composition	Lecture  Group discussion  P

		resentation ion
<b>Practical session</b>		
<b>Week 7-16</b>	<b>Chapter 6- Development and Assessment of thehealth related components of fitness</b>	Field Practice

- Explanation
- Demonstration

### Assessment techniques

Students are expected to participate in and complete all of the assessment criteria listed below.

Types of Assessment	Assessment Date	Assessment Weight	Competency to be assessed
Test (Written)	Week 3	10%	Chapter 1
Group assignment (peer fitness assessment)	Week 8	20%	Chapter 5
Mid - term exam (Written)	Week 9	30%	Chapter 1,2,3,& 4
Final exam - practical group assignment (peer training on the five components of fitness)	Week 14 - 16	40%	Chapter 6

#### **Instructor's commitment**

- Provide maximum physical activity time within the class period
- Promote equal participation of all students in the course
- Teach skills and activities that transfer in to lifetime physical activity
- Motivate students to be active participants in the course
- Praise for active participation

### Course policies

<b>Grading</b>	As per the university's legislation
<b>Attendance policy</b>	As per the legislation of the university
<b>Class Participation:</b>	The success of this course and students learning experience is dependent on active engagement and participation of the students in all the spectrum of the course. Students are expected to come well prepared/dressed and constructively engage in class.

<b>Class Discipline</b>	<p>“In each and every aspect of life, discipline comes first and worth a lot”.</p> <p>This is what department of Sport Science reflects. As a result of this, anynoise, chatting, chewing gum and the like are prohibited in every sessions</p>
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	of the course. In addition to these portable electronic media and communicative devices such as cell phones, pagers, MP3 players, I pods etc are not be used during the class for any reason. Thus, these devices should be switched off and kept out of sight.
<b>Reference materials</b>	
<b>Text</b>	<ul style="list-style-type: none"> <li>• Charles B. Corbin, Gregory J. Weik, William R. Corbin and Karen A. Welk. (2006). Concepts of fitness and wellness: a comprehensive lifestyle approach. 6<sup>th</sup> ed.</li> </ul>
<b>Reference</b>	<ol style="list-style-type: none"> <li>1. Schott k. Powers, Stephen L. Dod and Virginia J. (2006), TotalFitness and Wellness.</li> <li>2. Paul M, and Walton T. (2006), Core Concepts in Health, 10<sup>th</sup> edit.</li> <li>3. Charles B. Corbin and Ruth Lindsey (1990), Fitness for life, 3<sup>rd</sup> Edition, Scott.</li> </ol>

**Course Title:** Inclusiveness

**Course Code:** Incl-1012

**Module name:**

**Module code:**

**Course ECTS:** 3

## **I. Course information**

**Target group:** Compulsory for All Undergraduate Freshman Students

**Instructor:**

**Academic Year:**

**Program :**

**Year :**

## **II. Course Description**

In now days there is a conviction that development should be all inclusive and participatory that embraces the whole segments of the society including people with disabilities marginalized groups and people who are at risk due to various reasons. Unfortunately, these groups of people are still excluded from the rest of the society due to attitudinal, environmental and institutional barriers that existed within the government structure and communities for the last many centuries.

Exclusion practices of persons with disabilities and other marginalized groups have a long history, affecting the life of people with disabilities and the society at large. History witnessed that as of the second half of the 20th century, families of PWDs and other concerned groups made relentless struggle to make differences in the life of people with disabilities. As a result, gradual progress of change was achieved through litigation and legislation at policy and grass root levels that opened the door of opportunity for the inclusion of people with disabilities in public services.

Inclusiveness promotes effective developments through full participation of all members of a population, including people with disabilities and other marginalized and vulnerable groups. It is worth mentioning that the inclusion of people with disabilities and other vulnerable groups in public agendas realizes the socio-economic development of the society.

Hence, in this course, higher education students will be able to learn the following basic concepts related to the principles and practices of inclusiveness in terms of the special and or specific needs of people with disabilities and other vulnerable groups.

- Strategies how to identify and assess the special needs of various types of and groups of people with disabilities and vulnerable groups.
- Mechanisms how to adapt regular services to be accessible and accommodative for persons with disabilities and other vulnerable groups through developing barrier free service environment.
- Appropriate approaches how to remove all forms of barriers and design relevant interventions that would enable PWDs and other vulnerable groups to be mainstreamed in public services or socio-economic activities of the society profoundly and significantly.
- The fact that all service providers including professionals and practioners have responsibility to respect the rights of PWDs and other vulnerable groups and make the inclusion of these groups of people as a part of their duty in their professional engagement.

### III. Course objectives and Expected Learning Outcomes

The overall objective of the course is to enable learners to be equipped with adequate knowledge, positive attitude and skills regarding the issues related to people with disabilities and other vulnerable groups and build their capacity to address the special needs of these underserved segments of the society in their future professional engagement.

This also course is intended to promote collaborative engagement of learners for the promotion of the issue of people with disabilities and other vulnerable groups at all levels of public services and community life using inclusiveness as a strategy to meet the basic and special needs of these neglected groups of the society.

**As a result, up on the completion of the course, students will be able to:**

- **Comprehend** the principles and practices of inclusiveness;
- **Understand** the special/specific needs and potentials of persons with disabilities and other vulnerable groups;
- **Identify** environmental, attitudinal/social and institutional barriers that hinder the effective participation of persons with disabilities and other vulnerable groups in a society on an equal basis with others;

- **Demonstrate** desirable inclusive attitude towards all persons with disabilities and other vulnerable groups;
- **Apply** appropriate assessment strategies for service provisions intended to meet the needs of PWDs and other vulnerable groups;
- **Adapt** environments and services to be accessible and inclusive for the needs of persons with disabilities and other vulnerable groups;
- **Utilize** appropriate assistive technologies and other specialized support mechanisms that address the needs of persons with disabilities and other vulnerable groups;
- **Respect and advocate** the rights of persons with disabilities and other vulnerable groups;
- **Work** collaboratively with special needs education and other relevant professionals and significant others for the overall success and life career persons with disabilities and other vulnerable groups;
- **Contribute** for the development of inclusive general public, (the society for all).

#### **IV. Course Contents**

##### **Chapter 1: Understanding Diversity and Multiculturalism**

- 1.1. Concept of Diversity
- 1.2. Multiculturalism/ Cultural Pluralism
- 1.3. Disability as a diversity
- 1.4. Vulnerability

##### **Chapter Two: The Concept of Inclusion and Inclusiveness**

- 2.1. Concept of Inclusion
- 2.2. Principles of Inclusion
- 2.3. Rationale for Inclusion

##### **Chapter Three: Approaches of Disability Inclusion and Differentiated Service Provisions**

- 3.1. Understanding persons with Disability and Vulnerability
- 3.2 Factors affecting Life of Persons with disabilities
- 3.3. The Family and Disability
- 3.4. Interventions: Disability Inclusions and Rehabilitation Services
- 3.5. Minority groups

### 3.6. Community-Based Rehabilitation [CBR]

## **Chapter 4: Promoting Inclusive Culture**

- 4.1 Concepts of an inclusive culture
- 4.2 Building inclusive community
- 4.3 Inclusive values in terms of cultural norms
- 4.4 Indigenous inclusive values and practices

## **Chapter 5: Inclusion for Peace, Democracy and Development**

- 5.1. Definition of peace, democracy and development
- 5.2. Sources of Conflict
- 5.3. The democratic principles for inclusive practices

## **Chapter 6: Relevant Policy and Legal frameworks**

- 6.1. Components of policy and legal frameworks
- 6.2. International legal frameworks in relation to inclusiveness
- 6.3. Domestic policy and legal frameworks in relation to inclusiveness

## **Chapter 7: Management of Stakeholders and Resources Inclusion**

- 7.1. The concepts of stakeholder, collaboration, and partnership
- 7.2. The benefits, challenges, and characteristics of successful collaboration
- 7.3. Management of Resources for Inclusion
- 7.4. Planning for inclusive services

### **v. Approach/Methods/Strategies**

This section is flexible to involve the instructor's creativity in identifying, selecting and adapting the instructional method to the context of the learner. Some general approaches are listed below. The instructor can select among this and add his own that he/she feels appropriate.

- Interactive lectures;
- Cooperative learning;
- Brainstorming;

- Discussion;
- Role play;
- Independent/self-learning;
- Field visits;
- Individual and group assignments and presentation;
- Seminars;
- Individual and group presentations;
- Special needs/inclusive education expert consultancy.

## **VI. Assessment and Evaluation Methods**

Dear students, for each content you will complete getting started activities, read selected materials complete course works and group assignments. Assessment of the students would be a continuous process. The following schemes of evaluation would be used:

- Tests 10%;
- Assignment/group/assignment 10%;
- Mid exam 30%;
- Final exam 50% .

# Economics and Business module course syllabi

**Course title: Economics**

**Course code: Econ1012**

**ECTS: 5**

## Units and contents

Lecture	Topic & Sub Topics of the Course
<b><u>Chapter One: Introduction</u></b>	
<b>6 hours</b>	<b><u>1. Introduction</u></b> Definition and Meaning of Economics Rationale of Economics Scope and methods of economic analysis Micro and macro economics Positive and normative economics Inductive and deductive reasoning in economics. Scarcity, choice, opportunity cost and production possibilities frontier Basic economic questions, Economic systems

	1.7. Decision making units and the circular flow model
<b>Chapter Two: Theory of Demand and Supply</b>	
<b>8 hours</b>	<p>2. Theory of Demand and Supply</p> <p>    Theory of Demand</p> <p>        Demand function, demand schedule and demand curve</p> <p>        Determinants of Demand</p> <p>        Elasticity of Demand</p> <p>    Theory of Supply</p> <p>        Supply function, supply schedule and supply curve</p> <p>        Determinants of supply</p> <p>        Elasticity of supply</p> <p>    Market equilibrium</p>
<b>Chapter Three: Theory of Consumers' Behaviour</b>	
<b>9 hours</b>	<p>3. Theory of Consumers' Behaviour</p> <p>    Consumer preferences</p> <p>    The concept of utility</p> <p>    Approaches of measuring Utility</p> <p>        The cardinal utility approach</p> <p>            Assumptions of cardinal utility theory</p> <p>            Total and marginal utility</p> <p>            Law of diminishing marginal utility (LDMU)</p> <p>            Equilibrium of the consumer</p> <p>        The ordinal utility approach</p> <p>            Assumptions of ordinal utility approach</p> <p>            Indifference curve and map</p> <p>            Properties of indifference curves</p> <p>            The marginal rate of substitution (MRS)</p> <p>            The budget line or the price line</p> <p>            Equilibrium of the consumer</p>
<b>Chapter Four : The Theory of Production and Costs</b>	
<b>8 hours</b>	<p>4. Theory of Production and Costs</p> <p>    Theory of production in the short run</p> <p>        Definition of production</p> <p>        Production function</p> <p>        Total, average, marginal product</p> <p>        The law of variable proportions</p> <p>        Stages of production</p> <p>    Theory of costs in the short run</p>



	<p>Definition and types of costs  Total, average, marginal costs in the short run  Relationship between short-run production and cost curves</p>
<b>Chapter Five: Market structure</b>	
<i>6 hours</i>	<p>5. Market structure</p> <p>The concept of market in physical and digital space</p> <p>Perfectly Competitive market</p> <p>Assumptions</p> <p>Short run equilibrium of the firm</p> <p>Short run equilibrium of the industry</p> <p>Monopoly market</p> <p>Definition and Characteristics</p> <p>Sources of Monopoly</p> <p>Monopolistically competitive market</p> <p>Definition and characteristics</p> <p>Oligopolistic market</p> <p>Definition and characteristics</p>
<b>Chapter Six: Fundamentals of macroeconomics (with stylized facts from Ethiopia)</b>	
<i>11 hours</i>	<p>6. Fundamentals of macroeconomics</p> <p>Goals of Macroeconomics</p> <p>The National Income Accounting</p> <p>Approaches to measure national income (GDP)</p> <p>Other income accounts (GNP, NNP, NI, PI and DI)</p> <p>Nominal versus Real GDP</p> <p>The GDP deflator and the Consumer Price Index(CPI)</p> <p>The Business Cycle</p> <p>Macroeconomic Problems</p> <p>Unemployment</p> <p>Inflation</p> <p>Trade deficit and budget deficit</p> <p>Macroeconomic Policy Instruments</p> <p>Monetary policy</p> <p>Fiscal policy</p>

## Course teaching methodology

The course will involve deploying different teaching methods that attempt to make the teaching- learning process as effective as possible. For most part of the course, delivery method will be arranged as to make the process student-centered. There shall be full and active participation from students and they are strongly encouraged to ask questions, to reflect on brain-storming queries, and be involved actively and attentively in take-home assignments and peer discussions that appear during the semester both within and outside class-room sessions.

While there is no limit to the imagination and flexibility of the instructor, the course delivery techniques will generally involve the following items:

- Lecture
- Brain-storming sessions
- Group discussions
- Individual and group assignments

### III. Assessment Methodology

Students will be evaluated using different mechanisms and their weights as indicated in the table below.

**Table1. General assessment profile**

Assessment method	Weight
Assignment (individual and/or group)	20%
Tests/ quizzes	30%
Final Exam	50 %
<b>Total</b>	100%

### IV. Course policy

- **Attendance:** it is compulsory to come to class on time and every time. If students are going to miss **85% of the class** during the term, they shall not be allowed to sit the final exam,
- **Assignments:** students must do their individual and group assignments and submit on time. Assignments shall be submitted on or before the due date as specified by the instructor,
- **Tests/Quizzes:** instructors should give short quizzes and tests as appropriate.

- **Cheating:** students must do their own work and should not copy answers from someone else.
- **Acts and mannerisms:** When students are in class, they are strictly forbidden from chewing gum, consuming any addictive substances, listening to recorders or CD players, or being involved in acts that interrupt the normal teaching-learning process. Besides, students are required to switch off their cell phones before class and exam sessions. Students who attempt to disobey these rules and regulations will be subject to disciplinary measures accordingly to the Senate Legislations of the University.

## V. Commitments of instructor & students

- **Preparedness:** students must come to class prepared by bringing the appropriate materials like handouts, worksheets, exercises given, text books and assignments. Students must plan their own learning through reading various course related materials and chapters in books. They are expected to work a lot individually to meet the requirement of the course. They have to use their time for group work and home study effectively.
- **Participation:** students are expected make active participation during class sessions.
- **Coordination:** instructors shall play a pivotal role in facilitating the teaching and learning processes both in the class room and outside the class rooms.

## VI. Readings and texts

1. A. Koutsoyiannis, *Modern Microeconomics*
2. D.N.Dwivedi, 1997, *Micro Economic Theory*, 3<sup>rd</sup> edition., Vikas Publishing
3. R.S. Pindyck& D.L. Rubinfeld, *Microeconomics*.
4. Hal R. Varian, *Intermediate Microeconomics: A Modern Approach*, 6<sup>th</sup> edition.
5. C.L.Cole, *Micro Economics: A Contemporary Approach*.
6. Ferguson & Gould's, 1989, *Microeconomic Theory*, 6<sup>th</sup> edition.
7. N. Gregory Mankiw, 2007, *Macroeconomics*, 4<sup>th</sup> edition.
8. P. Aghion and P. Howitt ,2009, *The Economics of Growth*, The MIT Press.
9. A. B. Abel and B.S. Bernanke, 2017, *Macroeconomics*, 9<sup>th</sup> edition, Pearson.
10. Ayele Kuris, *Introduction to Economics*, 2001.
11. Begg, Fisher & Dornbusch, 2005, *Macroeconomics*, 8<sup>th</sup> Ed.
12. Liberman, Marc and Hill, Robert E, 2005, *Introduction to Economics* 2<sup>nd</sup> Ed.
13. Richard E. Carmichael, 2006, *Economics for Everyone: An introduction to Economics*.

**Course Title:** Entrepreneurship

**Course Code:** MGMT-1012

**Module name:** Entrepreneurship and Business Development

**Module code:**

**Course ECTS:** 5

**Year/Semester Course is offered:** Year III Semester II

**Contact hours/ week:**

Course Information	
Course Objectives	<p>Upon the completion of this course, students will be able to:</p> <ul style="list-style-type: none"><li>✓ Define entrepreneurship within the context of society</li><li>✓ Identify business opportunities</li><li>✓ Prepare business plan</li><li>✓ Distinguish forms of business ownership</li><li>✓ Comprehend intellectual property rights in business practices</li><li>✓ Define basic marketing concepts</li><li>✓ Formulate context-based marketing strategies</li><li>✓ Identify and evaluate sources of financing new ventures</li><li>✓ Manage business growth and transition</li><li>✓ Practice ethical business with all stakeholders</li></ul>
Course Description	<p>This interdisciplinary course is designed to introduce students the meaning and concept of entrepreneurship, creativity, innovation and their manageable processes that can be applied across careers and work settings. It focuses on building entrepreneurial attitude and behavior that will lead to creative solution within community and organizational environments. The course topics include the history of entrepreneurship, the role of entrepreneurs in the globalized economy and the identification of entrepreneurial opportunities. The development of a business idea, products and services, marketing and developing new ventures, the examination of feasibility studies and the social and ethical implications of entrepreneurship are incorporated. Besides, issues related to starting and financing a new venture are included. Finally, managing growth, transition and sustainability of the venture are considered. And forms of business organizations, legal and regulatory frameworks of governing the whole system are also encompassed in the course syllabus.</p>

WEEKS	Major Contents	Readings
1 <sup>st</sup> week	<p><b>Introduction</b></p> <p>DefinitionandphilosophyofEntrep reneurshipVsEntrepreneurs</p> <p>Historicaloriginofe ntrepreneurship1.</p> <p>2. Typeof Entrepreneurs</p> <p>Rolewithineconomy</p> <p>EntrepreneurialCompetenceandEnvironmen t</p> <p>EntrepreneurialMindset</p> <p>DemographicFactors</p> <p>1.4.3.EntrepreneurialEnvironment</p> <p>1.5.Entrepreneurship,creativityandinnovation</p>	
2 <sup>nd</sup> week	<p><b>BusinessPlanning</b></p> <p>OpportunityIdentificationandEvaluation</p> <p>BusinessIdeaDevelopment</p> <p>BusinessIdeaIdentificatio n</p> <p>SourcesofBusinessIdeas</p> <p>MethodsforgeneratingBus inessIdeas</p> <p>TheConceptofBusinessPlannin g</p> <p>BusinessFeasibility</p> <p>TheBusinessplans</p> <p>Developingabusinessplan</p>	

3 <sup>rd</sup> week	<p><b>BusinessFormation</b></p> <p>TheConceptofBusinessDevelopme nt FormsofBusiness(a shortexplanation) DefinitionandImportan ceofSMEs Settingupsmallscalebus iness</p> <p>3.5Rolesof SMEs Business failureandsuccessfactors. Problemsofsmallscalebusin essinEthiopia</p> <p>3.7Organizationalstructureandentrepreneurialt eamformation</p>	
4 <sup>th</sup> week	<p><b>ProductorServiceDevelopment</b></p> <p>TheConceptofproductorser vicetechnology Productor service development Process Legal and regulatory frameworks Intellectual Property Protection/Productorservice protection Patent Trademarks Copyrighting</p>	
5 <sup>th</sup> and 6 <sup>th</sup> weeks	<p><b>Marketing</b></p> <p>TheConceptandphilosophyofmarketing MarketingMixandStrategies MarketingInformationSystem Marketingintelligence Marketingresearch</p> <p>5.4.Competitiveanalysis 5.5SellingandCustomerService</p>	
7 <sup>th</sup> week	<p><b>FinancingtheVenture</b></p> <p>Overview of Business Financing Source of financing Equity financing Debt financing</p>	

	Trade credit Lease financing Traditional Financing (Equip/Edir, etc.) Crowd Funding Microfinance in Ethiopia						
8 <sup>th</sup> week	<b>Managing Growth and Transition</b> Managing business growth New venture expansion strategies Business Ethics and Social Responsibility						
Teaching & Learning Methods/strategy	For the successful completion of this course, different <i>Student-Centered</i> Teaching methodologies will be applied. These include: Semi-Lecture, Lecture, group discussion and reflection, Discussion with Real World Entrepreneurs						
Assessment / Evaluation	The evaluation scheme will be as follows:						
				<b>Quiz</b>	Assignment	Final	Total
				5%	10%	50%	100%
Work load in hours	Hours Required						
	Lectures			Tutorials			Advising
	48			-			-
Roles of the Instructor	He/she will come to the class regularly on time and deliver the lecture in a well-organized manner. Besides, he/she is responsible to give feedback for each assessment.						

<p>Roles of the students</p>	<p>The success of this course depends on the students' individual and collective contribution to the class discussions. Students are expected to participate voluntarily, or will be called upon, to contribute to exercises and problems. Students are also expected to read the assigned readings and prepare the cases before each class so that they could contribute effectively to class discussions. Students must attend assignments by their own. Proficiency in this course comes from individual knowledge and understanding. Copying the works of others is considered as serious offence and leads to disciplinary actions.</p>
<p>Text and reference books</p>	<p>Hirsh Robert D. and D. and Peters Michael P. "Entrepreneurship" Fifth Edition, Tata McGraw Hill Edition, 2002.</p> <p><b>Further References</b></p> <p>☐ Justin G. Longenecker and Carlos W. Moore, Small Business Management</p>
	<p>12th edition, College Division South Western Publishing Co. Dallas, 2003</p> <ul style="list-style-type: none"> <li>❖ Holt David H. "Entrepreneurship – New venture Creation "Eastern Economy Edition, 2000.</li> <li>☐ Donald F. Kutatko and Richard M. Hodgetts, "Entrepreneurship: A Cotemporary Approach" Fourth Edition</li> <li>☐ Hailay Gebretinsae, Entrepreneurship and Small Business Management, 2nd Edition, approach ". Fourth Edition, the Dryden Press, 1998.</li> </ul>



**Course Title:** Global Trends

**Course Code:** GITr-1012

**Module name:** Global Affairs/Trends

**Module code:**

**Course ECTS:** 3

**Year/Semester Course is offered:** Year IV Semester II

**Contact hours/ week:**

Course Information	
Course Objectives	<p>At the end of the course, students will be able to:</p> <ul style="list-style-type: none"><li>➤ Understand nations, nationalism and states</li><li>➤ Explain the nature and historical development of international relations</li></ul>
Course Description	<ul style="list-style-type: none"><li>➤ Gain basic knowledge of the major theories in the discipline of International Relations and develop the ability to critically evaluate and apply such theories</li><li>➤ Elucidate national interest, foreign policy and diplomacy</li><li>➤ Explicate the nature and elements of international political economy and international law</li><li>➤ Examine the extent and degree of influence of state and non-state actors in the international system</li><li>➤ Examine the roles major international and regional institutions play in world politics</li><li>➤ Critically evaluate the major contemporary global issues</li><li>➤ Assess the overriding foreign policy guidelines of Ethiopia in the past and present</li><li>➤ Explore Ethiopia's role in regional, continental and global institutions and affairs</li></ul>

	<p>The course is designed to familiarize learners on the nature and development of international relations and global issues. It deals with nations, states, national interest, cooperation and conflict among states, and the role of state and non-state actors in the international system. Additionally, it explains the nature of international law, global political economy and the nexus between regionalism and globalization. It also critically examines the contemporary global issues and how the international community is trying to address them. It is organized to systematically examine international issues by employing different theories and providing concrete examples from different parts of the world. Last but not least, after providing rigorous understanding of how the international system functions, it will equip learners to consciously observe and critically understand the Ethiopia's Relations with the outside world. As the saying goes "Think globally act locally!"</p>	
WEEKS	Major Contents	Readings
1 <sup>st</sup> and 2 <sup>nd</sup>	<p><b>Understanding International Relations</b>  Conceptualizing Nations, Nationalism and States  The Nature and Evolution of International Relations  Actors of International Relations</p> <ul style="list-style-type: none"> <li>- State Actors</li> <li>- Non-State Actors</li> </ul> <p>Levels of Analysis in the International Relations  Power, Anarchy and Sovereignty in the International System  The Structure of International System</p> <p><b>Contending Theories of International Relations</b>  Realism and Neo-Realism  Liberalism and Neo-Liberalism  Marxism and Neo-Marxism  Critical Theory</p>	

	2.5. Constructivism 2..6. Modernism and Post-Modernism	
3 <sup>rd</sup> , 4 <sup>th</sup> and 5 <sup>th</sup>	<p><b>Foreign Policy and Diplomacy</b></p> <p>Conceptualizing National Interest, Foreign Policy and Diplomacy</p> <p>National Interest and Foreign Policy</p> <ul style="list-style-type: none"> <li>-Determinants of National Interest and Foreign Policy</li> <li>- Objectives of Foreign Policy</li> <li>- Foreign Policy Orientations</li> <li>- Instruments of Foreign Policy</li> </ul> <p>3.3 A Survey of Foreign Policy and Diplomacy of Ethiopia</p> <ul style="list-style-type: none"> <li>- Foreign Policy of Ethiopia during the Reign of Emperor Menilik II</li> <li>- Foreign Policy of Ethiopia during the Reign of Emperor Hailesillassie</li> <li>- Foreign Policy of Ethiopia during the Derg Regime</li> <li>- Foreign Policy of Ethiopia during the EPRDF</li> </ul>	
6 <sup>th</sup> and 7 <sup>th</sup>	<p><b>The International Political Economy (IPE)</b></p> <p>4.1. Meaning and Nature of IPE</p> <ul style="list-style-type: none"> <li>- The Nexus between Politics (State) and Economics (Market)</li> </ul> <p>4.2. Theoretical Perspectives on IPE</p> <ul style="list-style-type: none"> <li>- Classical Mercantilism and Economic Nationalism</li> <li>- Classical Liberalism and Adam Smith</li> <li>- Comparative Advantage and David Ricardo</li> <li>- Neoliberalism and Keynesianism</li> <li>- Marxism and Dependency Theory</li> <li>- Hegemonic Stability Theory</li> <li>- Developmental State Model</li> </ul> <p>4.3. The Political Economy of North-South, South-South: Conflict and Cooperation</p>	

8 <sup>th</sup> and 9 <sup>th</sup>	<p><b>International Law</b></p> <p>Meaning, Nature and Areas of International Law</p> <p>Sources and Subjects of International Law</p> <p>Law Making and Enforcement process at International and Domestic level</p> <p>Formation, Recognition and Responsibility of State under International Law</p>	
10 <sup>th</sup> , 11 <sup>th</sup> , 12 <sup>th</sup> and 13 <sup>th</sup>	<p><b>Regionalism and Globalization</b></p> <p>6.1. The Concept, Nature and Development of Regionalism and Regional Integration</p> <p>- The Old and New Regionalism</p>	

	<p>6.2. Major Theories of the Regional Integrations</p> <ul style="list-style-type: none"> <li>- Functionalism</li> <li>- Neo-functionalism</li> <li>- Inter- governmentalism</li> <li>- Supra-nationalism</li> <li>- Selected Cases of Regional Integration (EU, AU...)</li> </ul> <p>6.3. Definition and Evolution of Globalization</p> <ul style="list-style-type: none"> <li>- Aspects of Globalization</li> <li>- Actors of Globalization</li> <li>- Pros and Cons of Globalization</li> <li>- Ethiopia in a globalized World</li> </ul> <p>6.4. Regionalization versus Globalization and State</p> <ul style="list-style-type: none"> <li>- The Convergence, Divergence and Overlapping relations of Regionalization and Globalization</li> <li>- The Hypocrisy of Sovereignty</li> </ul>	
<p>14<sup>th</sup>, 15<sup>th</sup> and 16<sup>th</sup></p>	<p><b>Major Contemporary Global Issues</b></p> <p>Conceptualizing Global Issues Survey of Global Issues</p> <ul style="list-style-type: none"> <li>- Security Issues ( <ul style="list-style-type: none"> <li>• Terrorism, Religious Fundamentalism and political Extremism</li> <li>• Weapons of Mass Destruction and The Nuclear Power paradox</li> <li>• Illicit Human Trafficking, Drug Trafficking, Firearms Trafficking</li> </ul> </li> <li>- Environmental Issues <ul style="list-style-type: none"> <li>• Climate Change and Global warming</li> <li>• Technology Related Issues</li> <li>• Cyber Crime and Cyber Security</li> </ul> </li> <li>- Other Social, Economic and Political Issues <ul style="list-style-type: none"> <li>• Human Rights</li> <li>• Migration and Refugee</li> <li>• Trade War</li> </ul> </li> </ul>	

	<ul style="list-style-type: none"> <li>• Aid, Debt Relief</li> </ul>	
Teaching & Learning Methods/strategy	<p>For the successful completion of this course, different <i>Student-Centered</i> teaching methodologies will be applied. These include: Semi-Lecture, Class Discussion, Group discussion, Pair Discussion, peer-Learning etc</p>	
Assessment/	<p>The evaluation scheme will be as follows:</p>	

Evaluation				Quiz	Assignment		Total
				5%	10%		100%
Work load in hours	Hours Required						
	Lectures			Tutorials	Self-Studies		Advising
				-	60		-
Roles of the Instructor	<p>He/she will come to the class regularly on time and deliver the lecture in a well-organized manner. Besides, he/she is responsible to give feedback for each assessment.</p>						
Roles of the students	<p>The success of this course depends on the students' individual and collective contribution to the class discussions. Students are expected to participate voluntarily, or will be called upon, to contribute to set exercises and problems. Students are also expected to read the assigned readings and prepare the cases before each class so that they could contribute effectively to class discussions. Students must attempt assignments by their own. Proficiency in this course comes from individual knowledge and understanding. Copying the works of others is considered as serious offence and leads to disciplinary actions.</p>						

Text and reference books	<ul style="list-style-type: none"> <li>• Altinay, Hakan (2011) <i>Global Civics: Responsibilities and Rights in an Interdependent World</i>. The Brookings institution: Washington</li> <li>• Armstrong, David(ed.)(2009). <i>Routledge Handbook of International Law</i>. London: Routledge</li> <li>• Baylis, J. and Smith, S. (eds.) (1997). <i>The Globalization of World Politics</i>. Oxford: Oxford University Press</li> <li>• Browlie, Ian (2003). <i>Principles of Public International Law</i>. (6th ed.). New York: Oxford University</li> <li>• Copson, Raymond w.(2007)<i>The United States in Africa: Bushpolicyand beyond in association with InternationalAfrican InstituteRoyalAfrican Societyof Social Science Research Council</i>, Zed Books: London</li> <li>• Crane, George T. and Abal Amawi (1997). <i>The Theoretical evolution of International Political Economy: A Reader</i> (2nd Edition). Oxford University Press: New York.</li> <li>• Crawford, Robert (2000) <i>Idealism and Realism in International Relations: Beyond the Discipline</i>. Routledge: USA</li> <li>• Demelo, Jaime and Arvind Panagariy(eds.) (1993)<i>ANew Dimensionsin Regional Integration</i>, Centre for Economic Policy Research 1993, Cambridge University Press:USA</li> </ul>
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**Course Title:** Introduction to Emerging Technologies

**Course Code:** EmTe-1021

**Module name:** Introduction to Emerging Technologies

**Module code:**

**Course ECTS:** 5

**Year/Semester Course is offered:** Year I Semester II

**Contact hours/ week:**

Course Information		
Course Objectives	By the end of this course the student will able to: <ul style="list-style-type: none"><li>• Identify different emerging technologies</li><li>• Differentiate different emerging technologies</li><li>• Select appropriate technology and tools for a given task</li><li>• Identify necessary inputs for application of emerging technologies</li></ul>	
Course Description	This course will enable students to explore current breakthrough technologies in the areas of Artificial Intelligence, Internet of Things and Augmented Reality that have emerged over the past few years. Besides helping learners become literate in emerging technologies, the course will prepare them to use technology in their respective professional preparations.	
WEEKS	Major Contents	
1 <sup>st</sup> and 2 <sup>nd</sup>	Introduction to Emerging Technologies	

	<ul style="list-style-type: none"> <li>❖ Evolution of Technologies <ul style="list-style-type: none"> <li>✓ Introduction to Industrial revolution</li> <li>✓ Historical Background (IR1.0,IR2.0,IR3.0,IR4.0)</li> </ul> </li> <li>❖ The role of Data for Emerging Technologies</li> <li>❖ Programmable devices</li> <li>❖ Human to Machine Interaction</li> <li>❖ Future Trends in Emerging Technologies</li> </ul>	
3 <sup>rd</sup> , and 4 <sup>th</sup>	<p>Introduction to Data Science</p> <ul style="list-style-type: none"> <li>❖ Definition of Data And Information</li> <li>❖ Data type and representation</li> <li>❖ Data Value Chain ( Data Acquisition,Analysis, Curating, Storage and usage)</li> <li>❖ Basic Concept of Big Data</li> </ul>	
5 <sup>th</sup> , 6 <sup>th</sup> and 7 <sup>th</sup>	<p>Artificial Intelligence(AI)</p> <ul style="list-style-type: none"> <li>❖ Introduction to AI</li> <li>❖ Application of AI</li> <li>❖ AI tools and platforms</li> <li>❖ Sample application with Hands onactivities</li> </ul>	

<p>8<sup>th</sup>, 9<sup>th</sup> and 10<sup>th</sup></p>	<p>Internet of Things(IOT)</p> <ul style="list-style-type: none"> <li>❖ Overview of IOT</li> <li>❖ How IOT works?</li> <li>❖ Application of IOT</li> <li>❖ IOT tools and platforms</li> <li>❖ Sample applications with hands on activities</li> </ul>	
<p>11<sup>th</sup>, and 12<sup>th</sup></p>	<p>Augmented Reality(AR)</p> <ul style="list-style-type: none"> <li>❖ Introduction to AR</li> <li>❖ Virtual Reality(VR), Augmented Reality(AR) Vs Mixed Reality(MR)</li> </ul>	

	<ul style="list-style-type: none"> <li>❖ Architecture of AR system</li> <li>❖ Application of AR system</li> </ul>																			
13 <sup>th</sup> and 14 <sup>th</sup>	<p>Ethic and Professionalism of Emerging Technologies</p> <ul style="list-style-type: none"> <li>❖ Technology and ethics</li> <li>❖ Digital Privacy</li> <li>❖ Accountability and Trust</li> <li>❖ Threats and Challenges</li> </ul>																			
15 <sup>th</sup> and 16 <sup>th</sup>	<p>Other Emerging Technologies</p> <ul style="list-style-type: none"> <li>❖ Nanotechnology</li> <li>❖ Biotechnology</li> <li>❖ Block chain Technology</li> <li>❖ Cloud and Quantum Computing</li> <li>❖ Autonomic Computing</li> <li>❖ Computer Vision</li> <li>❖ Embed System</li> <li>❖ Cyber Security</li> <li>❖ Additive Manufacturing (3D Printing) etc</li> </ul>																			
Teaching & Learning Methods/strategy	<p>For the successful completion of this course, different <i>Student-Centered</i> teaching methodologies will be applied. These include: Semi-Lecture, Class Discussion, Group discussion, Pair Discussion, Seminar, Demonstration, Video/Audio Visual, and Self-Reading, Debate</p>																			
Assessment/Evaluation	<p>The evaluation scheme will be as follows:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;">Quiz</td> <td style="width: 15%;">Assignment</td> <td style="width: 15%;">Final</td> <td style="width: 15%;">Total</td> </tr> <tr> <td></td> <td></td> <td></td> <td>5%</td> <td>10%</td> <td>50%</td> <td>100%</td> </tr> </table>					Quiz	Assignment	Final	Total				5%	10%	50%	100%				
			Quiz	Assignment	Final	Total														
			5%	10%	50%	100%														
Work load in hours	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td colspan="7">Hours Required</td> </tr> <tr> <td style="width: 15%;">Lectures</td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;">Tutorials</td> <td style="width: 15%;">Self-Studies</td> <td style="width: 15%;"></td> <td style="width: 15%;">Advising</td> </tr> </table>						Hours Required							Lectures			Tutorials	Self-Studies		Advising
Hours Required																				
Lectures			Tutorials	Self-Studies		Advising														

	48		-	60		-	
Roles of the Instructor	He/she will come to the class regularly on time and deliver the lecture in a well-organized manner. Besides, he/she is responsible to give feedback for each assessment.						
Roles of the	The success of this course depends on the students' individual and						

students	<p>collective contribution to the class discussions. Students are expected to participate voluntarily, or will be called upon, to contribute to set exercises and problems. Students are also expected to read the assigned readings and prepare the cases before each class so that they could contribute effectively to class discussions. Students must attempt assignments by their own. Proficiency in this course comes from individual knowledge and understanding. Copying the works of others is considered as serious offence and leads to disciplinary actions.</p>
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<ul style="list-style-type: none"> <li>• Text and reference books</li> </ul>	<ul style="list-style-type: none"> <li>• Follett, J. (2014). Designing for Emerging Technologies: UX for Genomics, Robotics, and the Internet of Things: O'Reilly Media.</li> <li>• Vong, J., &amp; Song, I. (2014). Emerging Technologies for Emerging Markets: Springer Singapore.</li> <li>• Del Rosal, V. (2015). Disruption: Emerging Technologies and the Future of Work. Emttechub.</li> <li>• Sadiku, M. N. O. (2019). Emerging Internet-Based Technologies: CRC Press. Mohamed Anis Bach Tobji, Rim Jallouli, Yamen Koubaa, Anton Nijholt Digital Economy. Emerging Technologies and Business Innovation, 2018.</li> <li>• Mahdi H. Miraz, Peter Excell, Andrew Ware, Safeeullah Soomro, Maaruf Ali, Emerging Technologies in Computing, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering 200, Springer International Publishing, 2018.</li> <li>• Francesco Corea. Artificial Intelligence and Exponential Technologies: Business Models Evolution and New Investment Opportunities, 2017.</li> <li>• Laura Igual and Santi Segui, Introduction to Data Science, A Python Approach to Concepts, Techniques and Applications, Springer International Publishing Switzerland, 2017.</li> <li>• Laura Igual, Santi Segui, Introduction to Data Science. A Python Approach to Concepts, Techniques and Applications, Undergraduate Topics in Computer Science, Springer, 2017.</li> <li>• Oleg Chertov, Tymofiy Mylovanov, Yuriy Kondratenko, Janusz Kacprzyk, Vladik Kreinovich, Vadim Stefanuk , Recent Developments in Data Science and Intelligent Analysis of Information, 2019</li> <li>• Carlos Cordon, Pau Garcia-Milà, Teresa Ferreira Vilarino, Pablo Caballero,</li> <li>• Strategy is Digital: How Companies Can Use Big Data in the Value Chain, 2016.</li> <li>• Timothy Jung, M. Claudia tom Dieck, Augmented Reality and</li> </ul>
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Virtual Reality:Empowering Human, Place and Business, 2019

- Jon Peddie, Augmented Reality : Where We Will All Live, SpringerInternational Publishing, 2017.
- Sandler, Ronald, ed.Ethics and Emerging Technologies. Springer, 2016. Sachin Ramar, David Oc'conner, Artificial Intelligence: How it Changes theFuture, 2019
- Federica Lucivero, Ethical Assessments of Emerging Technologies: Appraising the moral plausibility of technological visions, 2016



### **Module 3: Biomedical Sciences-I**

**Module name:** Biomedical science I

**Module category:** Basic

**Module code:** Biom-M1033

**Module number:** 03

**Module weight in ECTS:** 12

**Courses:**

<b>Course Name</b>	<b>Course Code</b>	<b>ECTS</b>
Human anatomy and histology	Anat 1031	7
Human physiology I	Physl 1032	5

#### **Module description**

Biomedical science I module emphasizes on structural organization of the human body at the gross (macroscopic) and histological (microscopic) level and also it addresses basic understanding of the function and regulation of the systems and organs of the human body. It will be delivered over a period of 2 semesters.

**Module objective:** The module is designed to provide students with a basic understanding of the structure, function and regulation of the human body

**Module competency:** Apply the normal anatomic and physiologic conditions of the human body to understand drugs effect

**Module Mode of delivery:** Parallel

#### **Module learning teaching methods**

Active learning methods (brain storming, buzz group, discussion, etc), Lecture, group & individual presentation, assignment, project work, and laboratory work.

#### **Module Assessment techniques:**

Quizzes

Mid exam

Final Exam

Seminar

Laboratory  
Assignment

## **BIOMEDICAL MODULE I COURSES SYLLABI**

**Course title:** Human Anatomy and Histology

**Course code:** Anat 1031

**Module name: Biomedical Module I**

**Module code:** Biom-M1033

**Course EtCTS:** 7 EtCTS (189 hrs)

- Lecture 64 hrs
- Tutorial 12 hrs
- Demonstration 36 hrs
- Independent Study 63 hrs
- Seminar, Assignment 8 hrs
- Assessment 6 hrs

**Year/Semester Course is offered: Year I Semester II**

**Contact hours/ week:** 3

**Pre-requisite:** None

**Course description:** This course covers the facts and concepts of human anatomy, intended for application to Pharmacy practice. The major goal is to enable students to increase knowledge and build upon their professional skills through understanding the relationships of the human body structure & their clinical relevance, in general

### **Course Objectives:**

To provide the basic anatomical & histological knowledge of the human body structures, their relationship and functions

1. Assess the basic knowledge of human body development.
2. Analyze the basic structure, location and functions of body tissues
3. Describe the knowledge of systemic Anatomy and their relationships
4. Apply the knowledge they acquired during the course to the profession

**Course mode of delivery: Block/Parallel**

### **Course learning and teaching methods**

- Active learning methods (brain storming, buzz group, discussion, etc), Lecture, group and individual presentation, assignment, project work, and laboratory work.

### **Assessment techniques:**

- Continuous assessments..... 50%

1. First test
2. Second test
3. Assignment, Group work and Oral Presentations
4. 3d assessment
5. Final Examination-----50 %

**Teachers and Students Role**

**References:**

1. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy
2. Tortora, G.J. & Bryan D. 11<sup>th</sup> edition and above. Principles of Anatomy & Physiology
3. Anthony L Mescher. Junqueira’s Basic Histology 11th ed. or above. McGraw-Hill Medical
4. T. W. Sadler. Langman’s Medical Embryology, 10th ed. or above. Lippincott Williams & Wilkins
5. Netter 2008. Netter’s Atlas Human Anatomy 5<sup>th</sup> ed. or latest Lippincott Williams & Wilkins

**Course Schedule:**

	Contact Hrs	Topic/sub-topic/Chapter	Reading Material
	2hrs	Unit-1 Introduction to human Anatomy 1.1. History, Definition and Divisions of Anatomy <ul style="list-style-type: none"> <li>• Divisions of Anatomy               <ol style="list-style-type: none"> <li>a. Gross anatomy(Macroscopic anatomy)                   <ul style="list-style-type: none"> <li>○ Systemic anatomy</li> <li>○ Regional anatomy</li> </ul> </li> <li>b. Microscopic anatomy</li> </ol> </li> <li>• Other subdivisions of anatomy               <ul style="list-style-type: none"> <li>• Applied (Clinical) anatomy</li> <li>• Surgical anatomy</li> <li>• Surface anatomy</li> <li>• Radiological anatomy</li> </ul> </li> </ul>	

		<p>1.2. Anatomical terminologies</p> <p>1.3. Body Parts, Views, Planes and Body Movement</p> <p>1.3.1 Anatomical positions</p> <p>1.3.2 Anatomical planes and sections</p> <ul style="list-style-type: none"> <li>• Anatomical planes <ul style="list-style-type: none"> <li>♣ Frontal (coronal) plane</li> <li>♣ Sagittal planes</li> <li>♣ Median (Midsagittal) plane</li> <li>♣ Transverse Plane</li> </ul> </li> <li>• Anatomical sections <ul style="list-style-type: none"> <li>♣ Coronal, median, horizontal, longitudinal, oblique, and cross-sections.</li> </ul> </li> </ul>	
1hr		<p>1.3.3 Directional terms in Anatomy</p> <p>*Terms of relationship (position)</p> <p>*Terms of movement</p> <p>1.4. Body regions and regional names.</p> <ul style="list-style-type: none"> <li>• Body regions <ul style="list-style-type: none"> <li>• abdominopelvic regions</li> <li>• abdominopelvic quadrants</li> </ul> </li> <li>• Regional names <ul style="list-style-type: none"> <li>○ The head</li> <li>○ The Neck</li> <li>○ The trunk</li> <li>○ The upper limb</li> <li>○ The lower limb</li> </ul> </li> </ul> <p>1.5. Body cavities and membranes</p> <ul style="list-style-type: none"> <li>• Body cavities <ul style="list-style-type: none"> <li>♣ Dorsal /posterior <ul style="list-style-type: none"> <li>• cranial cavities</li> <li>• Vertebral cavity</li> </ul> </li> <li>♣ Ventral/anterior body cavities <ul style="list-style-type: none"> <li>• Thoracic cavity</li> </ul> </li> </ul> </li> </ul>	
	1hr		

		<ul style="list-style-type: none"> <li>• The Abdominopelvic cavity</li> </ul> <p>1.6 Levels of structural organization</p> <ul style="list-style-type: none"> <li>• Chemical level of organization</li> <li>• The cellular levels of structural organization</li> <li>• The tissue levels of organization</li> <li>• The organ levels of organization</li> <li>• The system levels</li> <li>• The organismal level</li> </ul>	
	1hr	<p>Unit – 2: Cellular Organization of the Body</p> <p>2.1. Introduction</p> <p>2.2. The cytoplasm, cytoplasmic organelles and cytoplasmic inclusions</p> <p>2.3. The plasma membrane</p> <p>2.4. Cell nucleus</p> <p>2.5. Cell cycle</p> <p>2.6 Cell extensions and connection</p> <ul style="list-style-type: none"> <li>✓ Cilia, Flagella and cytoskeleton</li> <li>• Applied Anatomy</li> </ul>	<p>1. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy</p> <p>Anthony L Mescher. Junqueira’s Basic Histology 11th ed or above. McGraw-Hill Medical.</p>
	2hrs	<p><b>UNIT -3: HUMAN BODY TISSUES</b></p> <p>Introduction</p> <p>3.1. Tissue types</p> <ul style="list-style-type: none"> <li>• The primary tissue classes</li> <li>• Embryonic tissues</li> </ul> <p>3.2. Epithelial tissues</p> <ul style="list-style-type: none"> <li>• Covering epithelium and epithelial membranes</li> <li>• Glandular epithelium</li> </ul> <p>3.3. Connective tissues</p> <ul style="list-style-type: none"> <li>• Classification</li> <li>• Embryonic connective tissue</li> <li>• Connective tissue proper</li> </ul>	

		<ul style="list-style-type: none"> <li>• Connective tissue supportive: bone and cartilage</li> <li>• Cartilage <ul style="list-style-type: none"> <li>• Hyaline Cartilage</li> <li>• Elastic Cartilage</li> <li>• Fibrocartilage</li> </ul> </li> <li>• Bone <ul style="list-style-type: none"> <li>• Compact bone</li> <li>• Spongy bone</li> </ul> </li> </ul>	
	3hr	<ul style="list-style-type: none"> <li>• Connective tissue with special properties: Blood <ul style="list-style-type: none"> <li>♣ Red Blood Cells (erythrocytes)</li> <li>♣ White Blood Cells (leukocytes)</li> <li>♣ Platelets</li> </ul> </li> <li>3.4. Muscle tissue <ul style="list-style-type: none"> <li>• Skeletal muscle</li> <li>• Cardiac muscle</li> <li>• Smooth muscle</li> </ul> </li> <li>3.5. Nerve tissues <ul style="list-style-type: none"> <li>♠ Neurons</li> <li>♠ Neuroglia</li> </ul> </li> </ul>	Anthony L Mescher. Junqueira's Basic Histology 11th ed or above. McGraw-Hill Medical.
	1hr	Applied anatomy	
	2hrs	Unit – 4. GENERAL EMBRYOLOGY 4.1. Introduction 4.2. Gametogenesis <ul style="list-style-type: none"> <li>♠ Formation of male gamete</li> <li>♠ Formation female gamete</li> </ul> 4.3. Fertilization 4.4.1 <sup>st</sup> week of embryonic development <ul style="list-style-type: none"> <li>• Fertilization</li> <li>• Cleavage of the zygote</li> <li>• Morula</li> <li>• Blastocyst formation</li> <li>• Implantation</li> </ul> 4.5. 2 <sup>nd</sup> week of embryonic development <ul style="list-style-type: none"> <li>♠ Formation of syncytiotrophoblast</li> <li>♠ Formation of cytotrophoblast</li> </ul>	
	1hr	4.6.3 <sup>rd</sup> week of embryonic development <ul style="list-style-type: none"> <li>○ Differentiation of germ layers <ul style="list-style-type: none"> <li>• Ectoderm</li> <li>• Mesoderm</li> <li>• Endoderm</li> </ul> </li> </ul>	T. W. Sadler. Langman's Medical Embryology, 10th ed or above. Lippincott Williams & Wilkins.

	1hr	<p>4.7. Placenta</p> <ul style="list-style-type: none"> <li>• function of placenta</li> <li>• structures of placenta</li> </ul> <p>4.8 Twins</p> <ul style="list-style-type: none"> <li>• Fraternal twins</li> <li>• Identical twins</li> </ul>	
	1hr	<p>UNIT-5: INTEGUMENTARY SYSTEM</p> <p>5.1. Structure of the skin ,functions of skin</p> <p>5.2. Epidermis</p> <ul style="list-style-type: none"> <li>♣ Four types of cells <ul style="list-style-type: none"> <li>• Keratinocytes</li> <li>• Melanocytes</li> <li>• Merkel cells</li> <li>• Langerhans cells</li> </ul> </li> </ul> <p>Layers (from deep to superficial)</p> <ul style="list-style-type: none"> <li>• Stratum basale or germinativum</li> <li>• Stratum spinosum**</li> <li>• Stratum granulosum**</li> <li>• Stratum lucidum **</li> <li>• Stratum corneum **</li> </ul> <p>(**Thick skin only)</p> <ul style="list-style-type: none"> <li>• Stratum basale or germinativum*</li> <li>• Stratum spinosum*</li> <li>• Stratum granulosum*</li> <li>• Stratum corneum*</li> </ul> <p>(*Thin skin only)</p> <p>5.3. Dermis</p> <p>Two layers:</p> <ul style="list-style-type: none"> <li>• Papillary</li> <li>• Reticular</li> </ul> <p>Fiber types:</p> <ul style="list-style-type: none"> <li>♣ collagen</li> <li>♣ elastic</li> <li>♣ Reticular</li> </ul> <ul style="list-style-type: none"> <li>• Hypodermis(superficial fascia)</li> </ul> <p>5.4. Appendages of the skin</p> <p>5.4.1. Subcutaneous glands</p>	



	1hr	<ul style="list-style-type: none"> <li>• Sweat glands</li> </ul> Types of sweat glands: <ul style="list-style-type: none"> <li>♣ Eccrine or merocrine</li> <li>♣ Apocrine</li> </ul> <ul style="list-style-type: none"> <li>• Sebaceous glands</li> <li>• Ceraminous glands*</li> <li>• Mammary glands*</li> </ul> *Modified apocrine glands	
	1hr	5.4.2. Hair <ul style="list-style-type: none"> <li>• Parts: <ul style="list-style-type: none"> <li>♣ Root imbedded in skin</li> <li>♣ Shaft projecting above skin surface</li> </ul> </li> <li>• Three concentric layers: <ul style="list-style-type: none"> <li>• Medulla (core)</li> <li>• Cortex (surrounds medulla)</li> <li>• Cuticl(single layers, overlapping)</li> </ul> </li> <li>• Types of hair: <ul style="list-style-type: none"> <li>• Vellus: fine, short hairs</li> <li>• Intermediate hairs</li> <li>• Terminal: longer, courser hair</li> </ul> </li> </ul>	
	1hr	5.4.3. Nails 5.5. Skin color Three skin pigments: <ul style="list-style-type: none"> <li>• Melanin</li> <li>• Carotene</li> <li>• Hemoglobin</li> </ul>	<ul style="list-style-type: none"> <li>• Applied Anatomy  Anthony L Mescher. Junqueira’s  Basic Histology 11th ed or above.  McGraw-Hill Medical.</li> </ul>
	2hrs	UNIT-6: THE SKELETAL SYSTEM 6.1. Surface making and their functions 6.2. Type of bones and their histology The Structure of a Typical Bone: <ul style="list-style-type: none"> <li>• Compact bone  The Histological Features of compact bone: <ul style="list-style-type: none"> <li>♣ Osteon (Haversian System)</li> <li>♣ Central (Haversian) canal</li> <li>♣ Perforating (Volkmann’s) canal</li> </ul> </li> <li>• Spongy bone</li> </ul>	

	1hr	<p>The Histological Features of Spongy Bone:</p> <ul style="list-style-type: none"> <li>• Lamellae</li> <li>• <i>Trabeculae</i></li> </ul> <p>6.3 Types of Bone Cells</p> <ul style="list-style-type: none"> <li>• Osteoblasts</li> <li>• Osteocytes</li> <li>• Osteoclasts</li> </ul> <p>Classification of Bones:</p> <ul style="list-style-type: none"> <li>• Long bones</li> <li>• Short bones</li> <li>• Flat bones</li> <li>• Irregular bones</li> <li>• Sesamoid bones</li> <li>• Accessory bones</li> </ul> <p>6.4. Division, Location, and Functional anatomy of the bone of the human body</p> <p>6.4.1. Axial skeleton</p> <ul style="list-style-type: none"> <li>• The Skull <ul style="list-style-type: none"> <li>♣ 8 cranial bones</li> <li>♣ 14 facial bones</li> </ul> </li> <li>• The hyoid bone(1)</li> <li>• The Auditory ossicles(3pairs) <ul style="list-style-type: none"> <li>○ Malleus</li> <li>○ incus</li> <li>○ stapes</li> </ul> </li> <li>• Vertebral column- vertebrae <ul style="list-style-type: none"> <li>• 7cervical vertebrae</li> <li>• 12 thoracic</li> <li>• 5 lumbar</li> <li>• 1 sacrum (5 fused )</li> <li>• 1 coccyx (4 fused</li> </ul> </li> <li>• Thoracic cages <ul style="list-style-type: none"> <li>▪ Sternum</li> <li>▪ Ribs</li> <li>▪ Thoracic vertebrae</li> <li>▪ costal cartilages</li> </ul> </li> </ul>	
	1hr	<p>6.4.2. Appendicular skeleton</p> <ul style="list-style-type: none"> <li>• Bones of Pectoral girdle <ul style="list-style-type: none"> <li>• Clavicle (collarbone)</li> <li>• Scapula (shoulder blade)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• The Applied Anatomy</li> </ul> <p>Anatomy 5<sup>th</sup> edn or latest Lippincott Williams &amp; Wilkins</p>

	2hrs	<ul style="list-style-type: none"> <li>• The bones of upper limbs <ul style="list-style-type: none"> <li>○ humerus</li> <li>○ ulna</li> <li>○ radius</li> <li>○ Carpal</li> <li>○ metacarpal</li> <li>○ phalanges</li> </ul> </li> <li>• Bones of the pelvic girdle Formed by: <ul style="list-style-type: none"> <li>♣ hipbones(Ilium, Ischium and Pubis)</li> <li>♣ sacrum of the</li> <li>♣ coccyx</li> </ul> </li> <li>• Difference b/n male &amp; female pelvis</li> <li>• Types of pelvis <ul style="list-style-type: none"> <li>-True pelvis(lesser)</li> <li>-False pelvis(greater)</li> </ul> </li> <li>• The bones of lower limbs <ul style="list-style-type: none"> <li>♣ curural (Leg) bones-tibia &amp; fibula</li> <li>♣ The foot (Pes)</li> <li>♣ Tarsus – ankle</li> <li>♣ Metatarsals – sole</li> <li>♣ Phalanges – toes</li> </ul> </li> <li>• Bone Fractures <ul style="list-style-type: none"> <li>• Blood and nerve supply to bones</li> </ul> </li> </ul> <p>6.5. Joints /Articulations</p> <p>1. Structurally are of three types (i.e., based on presence or absence of joint cavity).</p> <ul style="list-style-type: none"> <li>• Fibrous- Immovable</li> <li>• Cartilaginous- slightly movable</li> <li>• Synovial- freely movable <ul style="list-style-type: none"> <li>♣ Hinge</li> <li>♣ Ball &amp; socket</li> <li>♣ Gliding</li> <li>♣ Saddle</li> </ul> </li> </ul> <p>2. Functionally are three types of joints (i.e. based on the degree of movement)</p> <ul style="list-style-type: none"> <li>♣ Synarthroses –immovable joints</li> </ul>	<ol style="list-style-type: none"> <li>2. Tortora, G.J. &amp; Bryan D. 11<sup>th</sup> edition and above. Principles of Anatomy &amp; Physiology</li> <li>3. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy Netter 2008. Netter’s Atlas of Human</li> </ol>
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		<ul style="list-style-type: none"> <li>♣ Amphiarthroses – slightly movable</li> <li>♣ Diarthroses – freely movable</li> </ul>	
	1hr	<p>UNIT-7: THE MUSCULAR SYSTEM</p> <p>7.1. The Skeletal muscle tissue</p> <p>7.2. The Connective tissue components</p> <ul style="list-style-type: none"> <li>• endomysium</li> <li>• perimysium</li> <li>• epimysium</li> </ul>	
	1hr	<p>7.3. Criteria for naming the skeletal system</p> <ul style="list-style-type: none"> <li>○ Named on the basis of: <ul style="list-style-type: none"> <li>♣ shape</li> <li>♣ location,</li> <li>♣ attachment</li> <li>♣ orientation of fibers</li> <li>♣ relative position, or function</li> </ul> </li> </ul>	
	2hrs	<p>7.4. The principal skeletal muscles in the body</p> <ul style="list-style-type: none"> <li>• Name</li> <li>• Origin and Insertion</li> <li>• Nerve Supply</li> <li>• Blood supply</li> <li>• Function ( action) <ul style="list-style-type: none"> <li>♣ Maintenance of body posture</li> <li>♣ Movement</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Applied Anatomy</li> </ul> <ol style="list-style-type: none"> <li>1. Tortora, G.J. &amp; Bryan D. 11<sup>th</sup> edition and above. Principles of Anatomy &amp; Physiology</li> <li>2. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy Netter 2008. Netter’s Atlas of Human Anatomy 5<sup>th</sup> edn or latest Lippincott Williams &amp;Wilkins.</li> </ol>
	1hr	<p>UNIT – 8: THE NERVOUS SYSTEM</p> <p>8.1. Protection &amp; coverings</p> <p>8.1.1. The meninges</p> <ul style="list-style-type: none"> <li>• Dura mater</li> <li>• Arachnoid membrane</li> <li>• Pia mater</li> <li>• Sub arachnoid space</li> </ul>	
	2hrs	<p>8.2.2. The cerebrospinal fluid</p> <p>8.2.1. The brain ventricles</p> <ul style="list-style-type: none"> <li>• The lateral ventricles</li> <li>• The 3<sup>rd</sup> ventricle</li> </ul>	

		<ul style="list-style-type: none"> <li>• The 4<sup>th</sup> ventricle</li> </ul>	
3hrs	<p>8.2.2. The formation, circulation and absorption of CSF</p> <p>8.2. Division, organization and functional anatomy of nervous system</p> <p>8.2.1. The Central Nervous System (CNS)</p> <ul style="list-style-type: none"> <li>• The Brain <ul style="list-style-type: none"> <li>- Principal parts</li> <li>- External structure</li> <li>- Internal structure</li> <li>- Function</li> <li>- Cranial nerves</li> </ul> </li> <li>• The spinal cord <ul style="list-style-type: none"> <li>- External structure</li> <li>- Internal structure</li> <li>- Function</li> <li>- Spinal nerves</li> </ul> </li> </ul> <p>8.2.2. The Peripheral Nervous System (PNS)</p> <ul style="list-style-type: none"> <li>• Functional classification of nerves</li> <li>• Somatic nervous system</li> <li>• Autonomic nervous system <ul style="list-style-type: none"> <li>- Sympathetic division</li> <li>- Parasympathetic division</li> </ul> </li> </ul> <p>8.3. Sensory Organs</p> <ul style="list-style-type: none"> <li>• Special senses</li> </ul> <p>8.4. General senses</p>	<ul style="list-style-type: none"> <li>• Applied Anatomy</li> </ul> <ol style="list-style-type: none"> <li>1. Tortora, G.J. &amp; Bryan D. 11<sup>th</sup> edition and above. Principles of Anatomy &amp; Physiology</li> <li>2. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy Netter 2008. Netter's Atlas of Human Anatomy 5<sup>th</sup> edn or latest Lippincott Williams &amp; Wilkins.</li> </ol>	

	1hr	<p>UNIT-9: THE ENDOCRINE SYSTEM</p> <p>9.1. Types and locations of the Endocrine glands in the body</p> <ul style="list-style-type: none"> <li>• The pituitary gland</li> <li>• The thyroid gland</li> </ul>	
	2hrs	<ul style="list-style-type: none"> <li>• The Parathyroid gland</li> <li>• The Adrenal glands</li> <li>• The Gonads</li> <li>• Pancreas</li> <li>• Thymus and Pineal glands</li> <li>♣ Blood and nerve supply to Endocrine glands</li> </ul>	<ul style="list-style-type: none"> <li>• Applied Anatomy</li> </ul> <ol style="list-style-type: none"> <li>1. Tortora, G.J. &amp; Bryan D. 11<sup>th</sup> edition and above. Principles of Anatomy &amp; Physiology</li> <li>2. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy</li> </ol> <p>Netter 2008. Netter's Atlas of Human Anatomy 5<sup>th</sup> edn or latest Lippincott Williams &amp; Wilkins.</p>
	2hrs	<p>UNIT-10: THE CARDIOVASCULAR SYSTEM</p> <p>10.1. General consideration</p> <p>10.2. The Heart</p> <ul style="list-style-type: none"> <li>• Location and coverings</li> <li>• The structure of its wall</li> <li>• Heart chambers <ul style="list-style-type: none"> <li>- Right atrium</li> <li>- Left atrium</li> <li>- Right ventricle</li> <li>- Left ventricle</li> </ul> </li> <li>• Valves of the heart</li> <li>• Conducting system of the heart</li> <li>• Great vessels connected to the heart</li> <li>• Blood and nerve supply to the heart</li> </ul>	
	2hrs	<p>10.3. The blood vessels</p> <ul style="list-style-type: none"> <li>• Types</li> <li>• General structure of blood vessels</li> <li>• Distribution of blood vessels in the body <ul style="list-style-type: none"> <li>- Arterial distribution</li> <li>- Venous drainage</li> </ul> </li> </ul> <p>10.4. Circulatory routes</p> <ul style="list-style-type: none"> <li>• Systemic circulation</li> </ul>	

		<ul style="list-style-type: none"> <li>• Pulmonary circulation</li> <li>• Hepatic circulation</li> <li>• Cerebral circulation</li> </ul>	
	2hrs	<p>10.5. The Lymphatic System</p> <ul style="list-style-type: none"> <li>• The Lymph vessel</li> <li>• The Lymph nodes</li> <li>• The Lymph Circulation</li> <li>• The Lymph organs</li> </ul>	<ul style="list-style-type: none"> <li>• Applied Anatomy</li> </ul> <ol style="list-style-type: none"> <li>1. Tortora, G.J. &amp; Bryan D. 11<sup>th</sup> edition and above. Principles of Anatomy &amp; Physiology</li> <li>2. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy</li> </ol> <p>Netter 2008. Netter's Atlas of Human Anatomy 5<sup>th</sup> edn or latest Lippincott Williams &amp; Wilkins.</p>
	3hrs	<p>UNIT-11: THE RESPIRATORY SYSTEM</p> <p>11.1. The pleurae</p> <p>11.2. The Lungs</p> <p>11.3. Function and structure</p> <p>11.4. The Respiratory pathways</p> <p>Nose, Larynx, Trachea, Bronchi and Alveoli</p>	<ul style="list-style-type: none"> <li>• Applied AnatomPharynx</li> </ul> <p>Recommended References</p> <ol style="list-style-type: none"> <li>1. Tortora, G.J. &amp; Bryan D. 11<sup>th</sup> edition and above. Principles of Anatomy &amp; Physiology</li> <li>2. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy</li> <li>3. Netter 2008. Netter's Atlas of Human Anatomy 5<sup>th</sup> edn or latest Lippincott Williams &amp; Wilkins.</li> </ol>
	1hr	<p>UNIT-12: THE DIGESTIVE SYSTEM</p> <p>12.1. The Peritoneum</p> <p>12.2. General organizations</p>	
	2hrs	<p>12.3. Structure and functional anatomy of the digestive system</p> <ul style="list-style-type: none"> <li>• The Oral cavity <ul style="list-style-type: none"> <li>- Tongue</li> <li>- Salivary glands</li> <li>- Teeth</li> </ul> </li> </ul>	
	2hrs	<ul style="list-style-type: none"> <li>• The pharynx</li> <li>• The esophagus</li> <li>• The stomach</li> <li>• The intestines</li> <li>• The accessory organs <ul style="list-style-type: none"> <li>- Liver</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Applied Anatomy</li> </ul> <p>Recommended References</p> <ol style="list-style-type: none"> <li>1. Tortora, G.J. &amp; Bryan D. 11<sup>th</sup> edition and above.</li> </ol>

		<ul style="list-style-type: none"> <li>- Gall bladder</li> <li>- Pancreases</li> </ul>	<p>Principles of Anatomy &amp; Physiology</p> <p>2. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy</p> <p>Netter 2008. Netter's Atlas of Human Anatomy 5<sup>th</sup> edn or latest Lippincott Williams &amp; Wilkins.</p>
	2hrs	<p>UNIT-13: THE URINARY SYSTEM</p> <p>13.1. The kidneys</p> <ul style="list-style-type: none"> <li>- External structure</li> <li>- Internal structure</li> </ul> <p>13.2. The Ureter</p> <p>13.3. The Urinary bladder</p> <p>13.4. The Urethra</p>	<ul style="list-style-type: none"> <li>• Applied Anatomy</li> </ul> <p>Recommended References</p> <ol style="list-style-type: none"> <li>1. Tortora, G.J. &amp; Bryan D. 11<sup>th</sup> edition and above. Principles of Anatomy &amp; Physiology</li> <li>2. Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy</li> </ol> <p>Netter 2008. Netter's Atlas of Human Anatomy 5<sup>th</sup> edn or latest Lippincott Williams &amp; Wilkins.</p>
	2hrs	<p>UNIT-14: REPRODUCTIVE SYSTEM</p> <p>14.1. The male reproductive system</p> <ul style="list-style-type: none"> <li>14.1.1. The spermatic cord</li> <li>14.1.2. The testes</li> <li>14.1.3. The Epididymis</li> <li>14.1.4. The duct system</li> </ul>	
	2hrs	<p>14.2. The female reproductive system</p> <ul style="list-style-type: none"> <li>14.2.1. The ovaries</li> <li>14.2.2. The fallopian tubes</li> <li>14.2.3. The uterus</li> <li>14.2.4. Endocrine relation</li> </ul>	
	2 hrs	<p>14.3.5. The vagina and vulva</p> <p>14.3.6. The Breast (mammary glands)</p>	<ul style="list-style-type: none"> <li>• Applied Anatomy</li> </ul> <p>Recommended References</p> <ul style="list-style-type: none"> <li>• Tortora, G.J. &amp; Bryan D. 11<sup>th</sup> edition and above. Principles of Anatomy &amp; Physiology</li> </ul>



			<ul style="list-style-type: none"><li>• Van de Graaf Kent 4<sup>th</sup> ed. and above. Human Anatomy Netter 2008. Netter's Atlas oHuman Anatomy 5<sup>th</sup> edn or latest Lippincott Williams &amp; Wilkins.</li></ul>
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**Course Title: Human Physiology I**

**Course Code:** Phyl1032

**Module name: Biomedical Module I**

**Module code:** Biom-M1033

**Course ECTS:** 5

- Lecture: 48 hours
- Tutorial: 16 hours
- Presentations: 15 hours
- Assignment: 7.5 hours
- Assessment (continuous and final) 8 hours
- Independent study (alone or in groups) 40.5 hours

**Mode of delivery:** Parallel

**Pre-requisite if any:** None

**Course description:**

This module will give an overview of a range of physiological systems, including the homeostasis, the cell and cell membrane transport, composition of the body Fluid, physiology of blood, physiology of the nerve, physiology of the muscle, autonomic NS, cardiovascular physiology, respiratory physiology, renal physiology, gastro intestinal system, energy metabolism, endocrine system, male and female reproductive system, central nervous system and the special senses.

**Course objectives:**

At the end of the module the student should be able to:

- Explain the composition of and levels of organization of human body.
- Describe the basic physiological principle of the “internal environment” of the body.
- Explain basic principles of homeostasis and homeostatic regulatory mechanisms.
- Describe functional importance of different organ systems of human body and their integrated role in the maintenance of homeostasis.
- Appreciate the various physiological regulatory mechanisms of the body in the maintenance of homeostasis.
- Describe the various structures of the GIT, Secretory functions of GIT, Digestive and Absorptive functions and Pathophysiology of the GIT.

- Explain about Energy and Metabolism, Body Temperature Regulation, Feeding regulation and its abnormalities.
- Describe in detail the various endocrine glands of the body and various hormones secreted, the pituitary gland function and malfunction, the thyroid gland function and malfunction, the adrenal gland hormonal abnormalities on the body functions, Calcium homeostasis and Glucose homeostasis.
- Describe the various structures of the male and female reproductive system, Pregnancy and contraception, Parturition and lactation.
- Explain the nervous mechanisms, which govern the regulation and homeostasis of the principal physiological systems.
- Describe in detail the general organization of the NS, Sensory and Motor functions of the NS, Higher motor centers - Functions and lesions.
- Describe the various special senses of the human body

**Course learning and teaching methods**

- Active learning methods (brain storming, buzz group, discussion, etc), Lecture, group and individual presentation, assignment, project work, and laboratory work.

**Assessment techniques:**

- Assignments and Seminars (20%)
- Quizzes (30%)
- Final-exam (50%)

**Teachers and Students Role**

**References:**

1. Guyton A. C 1995-2006. Textbook of Medical physiology. 9<sup>th</sup> -11<sup>th</sup> editions
2. Ganong WF 1993-2006. Review of Medical physiology, 18<sup>th</sup> -22<sup>nd</sup> editions
3. Tortora G. J 1993. Principles of Anatomy and physiology. 7<sup>th</sup> edition.
4. Salah Abu-Sitta. Handouts containing different chapters (eight separate handouts.)

**Course Schedule:** By contact time, contents/topics & reading/reference materials for each topic

Contact hrs	Topic/sub-topic/chapter	Reading Materials
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	3	<u>General Introduction and Cell Physiology (7Hrs)</u> <ul style="list-style-type: none"> <li>- Definition</li> <li>- Regulatory mechanisms in Physiology</li> <li>- Composition of human body</li> <li>- Cell and its functions</li> <li>- Cell membrane, functional structure</li> <li>- Homeostasis</li> <li>-</li> </ul>	Guyton (page 3-9) Ganong (p 1-28) Ganong (p 48)
	3	<ul style="list-style-type: none"> <li>- Cell organelles and their functions</li> <li>- Intracellular connections and Communications</li> </ul>	Guyton(p 9-17) Ganong(p36-48)
	3	<ul style="list-style-type: none"> <li>- Diffusion and osmosis</li> <li>- Endocytosis and exocytosis</li> <li>- Transports across cell membrane</li> <li>- Body fluid and electrolytes</li> </ul> <u>Physiology of Nerve (4 Hrs)</u> <ul style="list-style-type: none"> <li>- Functional structure of neurons</li> <li>- Classification of neurons and neuroglia cells</li> <li>- Membrane potential (resting membrane potential)</li> </ul>	Guyton(p 45-55) Ganong(28-36) Guyton(p 57-70) Ganong(p 60-63)
	3	<ul style="list-style-type: none"> <li>- Electrical signals and excitable cells</li> <li>- Action potential (nerve impulse)</li> <li>- Better to add Graded potential</li> </ul> Propagation of nerve impulse <ul style="list-style-type: none"> <li>- Synapses</li> <li>- Synaptic transmission at neuronal synapses</li> </ul> <u>Physiology of muscles (6 Hrs)</u> <ul style="list-style-type: none"> <li>- Classification of muscles</li> <li>- Muscle structure [Functional structure of skeletal muscle, Molecular basis of contraction, Muscle excitation (skeletal</li> </ul>	Guyton(p 57-70) Ganong(p 51-58) Guyton(p 559-570) Guyton(p 72-83) Ganong(p 85-119)

		<p>muscle &amp; smooth muscle), Excitation contracting coupling]</p> <ul style="list-style-type: none"> <li>- Mechanism of muscle contraction</li> <li>- Neuromuscular junction</li> </ul>	
	3	<ul style="list-style-type: none"> <li>- Excitation-Contraction coupling mechanism (skeletal &amp; smooth muscle, Molecular basis of contraction)</li> <li>- Tetanus &amp; clonus</li> <li>- Myasthenia gravis</li> <li>- Rigor mortis</li> <li>- General aspects of cardiac &amp; smooth muscles <ul style="list-style-type: none"> <li>- Sub divisions of smooth muscle</li> <li>- Control of smooth muscle contraction</li> <li>- Membrane potential and action potential</li> </ul> </li> </ul>	<p>Guyton(p 85-99) Ganong(78-84)</p>
	3	<p><u>The autonomic nervous system</u> (4 Hrs)</p> <ul style="list-style-type: none"> <li>- General organization of the NS</li> <li>- Basic difference between Somatic NS and ANS</li> <li>- Autonomic ganglia, Autonomic reflex</li> <li>- Divisions of ANA: Basic features of Sympathetic NS</li> <li>- Effect of ANA in various organs of the body</li> </ul>	<p>Guyton(p 748-757) Ganong(223-226) Guyton(p 757)</p>
	3	<ul style="list-style-type: none"> <li>- Autonomic transmitters and receptors, their mechanism of action</li> <li>- Introduction to the Pharmacology of the ANS</li> </ul> <p><u>Physiology of Blood</u>(6 Hrs)</p> <ul style="list-style-type: none"> <li>- General Introduction of blood <ul style="list-style-type: none"> <li>o Blood volume &amp; constituents</li> <li>o Plasma constituents</li> <li>o Erythrocytes &amp; blood grouping, anemia &amp; polycythemia</li> <li>o Leukocytes &amp; immune responses</li> </ul> </li> </ul>	<p>Guyton (p 759) Ganong(p 223-226) Guyton (p 419-428) Ganong(p 515-516)</p>

		<ul style="list-style-type: none"> <li>○ Platelets &amp; Homeostasis, coagulation disorders</li> <li>- Plasma and plasma proteins</li> </ul>	
	3	<ul style="list-style-type: none"> <li>- RBCs; anemia's and polycythemia</li> <li>- WBCs &amp; Immunology</li> </ul>	<p>Guyton(p 429-449)</p> <p>Ganong(p 516- 540)</p>
		<ul style="list-style-type: none"> <li>- Homeostasis, coagulation and disorders</li> <li>- Blood groups and blood transfusion</li> </ul> <p><b><u>Physiology of Cardiovascular System (9 Hrs)</u></b></p> <ul style="list-style-type: none"> <li>- Physiological anatomy of the heart</li> <li>- Basic properties of the cardiac muscle</li> <li>- Electro physiology of the cardiac muscle</li> <li>- Excitation contraction coupling of the myocardium</li> <li>- Electro cardio gram (ECG)</li> <li>- Cardiac cycle</li> <li>- The heart sounds</li> <li>- General Introduction; functional structure of the heart</li> <li>- Electrophysiology of the heart muscle</li> </ul>	<p>Guyton(p 451-467)</p> <p>Ganong(p 540-546)</p> <p>Guyton (p 103-110)</p> <p>Ganong (p 547-561)</p>
	3	<ul style="list-style-type: none"> <li>- The cardiac cycle</li> <li>- The E.C.G</li> <li>- The heart sounds</li> <li>- Ischemic heart disease and heart failure</li> <li>- The heart rate and its regulation</li> </ul>	<p>Guyton(p 116-121)</p> <p>Guyton(p 123-129)</p> <p>Ganong(p 565-570)</p> <p>Ganong(p 597-602)</p>
	3	<ul style="list-style-type: none"> <li>- The cardiac output in normal and in failing heart</li> <li>- The arterial blood pressure and its regulation</li> <li>- Tissue fluid formation and drainage, Edema</li> </ul>	<p>Guyton(p232-244)</p>
	3	<ul style="list-style-type: none"> <li>- The coronary circulation</li> <li>- Hypertension: causes, types, complications, Rx</li> <li>- Hypotension (Shock): stages and types</li> </ul> <p><b><u>Physiology of the Respiratory System (6 Hrs)</u></b></p>	<p>Guyton(p 161-179)</p> <p>Ganong(620-643)</p> <p>Guyton(p 278-287)</p> <p>Guyton(p 471-476)</p> <p>Ganong(p 647-666)</p>

		<ul style="list-style-type: none"> <li>- Introduction to RS</li> <li>- Mechanism of breathing</li> <li>- Diffusion and gas transport (O<sub>2</sub> and CO<sub>2</sub>)</li> <li>- Functional anatomy of respiratory system</li> <li>- Mechanics of Pulmonary ventilation</li> <li>- Pleural &amp; Alveolar pressure</li> <li>- Pulmonary volumes &amp; Capacities</li> <li>- Ventilation</li> <li>- Exchange of gasses</li> <li>- Transport of gasses</li> <li>- Non respiratory function of respiratory system</li> <li>- Regulation of respiration</li> <li>- Patho-Physiological aspects of respiratory system</li> </ul>	
	3	<ul style="list-style-type: none"> <li>- Regulation of breathing</li> <li>- Hypoxia, cyanosis</li> </ul>	<p>Guyton(p514-522)</p> <p>Ganong(p 671-678)</p>
	3	<ul style="list-style-type: none"> <li>- Pathophysiology of respiratory system</li> </ul> <p><b><u>Renal Physiology (8 Hrs)</u></b></p> <ul style="list-style-type: none"> <li>- Physiology of the body fluids</li> <li>- Body fluids &amp; their subdivision</li> <li>- Body fluids &amp; their compartments</li> <li>- Disturbance of volume concentration of body fluid</li> <li>- General renal function</li> <li>- Functional anatomy of the kidney</li> <li>- Renal blood flow &amp; its control</li> <li>- Function of the kidneys</li> <li>- Structural function of kidneys, nephrons</li> <li>- Urine formation, GFR, tubular load, Tm &amp; Plasma clearance</li> </ul>	<p>Guyton(p524-532)</p> <p>Ganong(p 683-695)</p> <p>Guyton(p 291-325)</p> <p>Ganong(p 699-70)</p>
	3	<ul style="list-style-type: none"> <li>- Concentration and dilution of urine</li> </ul>	<p>Guyton(p 402-414)</p> <p>Ganong(p 723-726)</p>

		<ul style="list-style-type: none"> <li>- Micturation and its abnormalities in some diseases</li> <li>- Pathophysiology of the renal system</li> </ul>	
	3	<ul style="list-style-type: none"> <li>- Acid-base balance</li> <li>- Chemical and physiological regulation</li> <li>- Acid-base imbalance and disturbances</li> </ul>	<p>Guyton(p 383-400)</p> <p>Ganong(p 724-726)</p>



## Module 4: Chemistry Module

**Module name:** Chemistry module

**Module category:** Basic

**Module code:** Chem-M1043

**Module Number:** 04

**Module weight in ECTS:** 7 ECTS

**Courses:**

Course Name	Course Code	ECTS
Organic Chemistry	Chem 1041	5
Organic Chemistry Laboratory	Chem1042	2

### Module description

Organic chemistry is a chemistry based discipline that deals with carbon related compounds. The module builds on the students' knowledge and understanding of functional groups, (structure, nomenclature, stereochemistry), reaction mechanisms, biological molecules and biotransformation. Students will acquire knowledge of some reactions of organic chemistry, particularly carbonyl reactions, substitution, addition and elimination reactions, which are, examined in terms of reaction type, mechanism and stereochemical implications. They will then apply this knowledge to devise organic synthetic pathways. The student will also examine the synthesis and reactivity of aromatic and heteroaromatic compounds with an emphasis on the named reactions.

**Module objective:** Students will demonstrate knowledge and understanding of the fundamental theories and practices of organic chemistry and apply the concepts and principles to solve problems related to Pharmacy. The course emphasize about classification, naming, identification, reaction, mechanism and synthesis or preparation of organic compounds and organic biological molecules. Differentiate organic chemicals in terms of their usefulness, hazards, and cautions to be taken in the manufacture, storage and use.

### Module competencies:

- Discuss the chemical bonding theories and influence of bonding types on properties of compounds
- Determine the stereochemistry of organic molecules
- Explain mechanisms in organic reactions and describe the factors affecting reaction rates
- Explain the physical and chemical behaviors of organic compounds based on their functional groups
- Explain the properties, preparation and reactions of organic compounds
- Describe different classes of Biological molecules and apply the knowledge and principles to Medicinal chemistry
- Predict the existence of the kinds of stereo isomers, represent and designate their structures

- Review of the classes of organic compounds and give systematic name to different organic compounds
- Develop practical laboratory skills in chemical and analytical procedures and realize the importance of chemistry in everyday life

**Mode of delivery:** Block

Total time: 189hrs

Lecture: 54 hrs

Tutorials: 6hrs

Practical lab: 42 hrs

Independent study hour: 65 hrs

Seminar, Assignments and assessment: 12 hrs

Assessment: 10 hrs

**Mode of Assessment:**

Laboratory Reports

Laboratory Presentation

Laboratory written Exam

Assignments and Seminars

Practical exam

Quizzes

Final-exam

**Chemistry Module syllabi****Course title:** Organic Chemistry**Course code:** Chem 1041**Module name:** Chemistry module**Module code:** Chem-M1043**Course EtCTS:** 5 EtCTS (135 hrs)

Lecture: 48hrs

Tutorials: 16hrs

Independent study hour: 57hrs

Seminar, Assignments: 8hrs

Assessment: 6 hrs

**Year/Semester Course is offered:** Year I Semester II**Contact hours/ week:****Pre-requisite:** None**Course description:**

This course is intended to provide the students basic understanding of different classes of organic functional groups ( alkanes, , alkenes, and alkynes, alkyl halides , alcohols, ethers, aromatic rings, ketones, aldehydes, carboxylic acids and their derivatives, amines biomolecules(carbohydrates, ,proteins, lipids and nucleic acid) with a special focus on their physical properties (boiling point, melting point, solubility,) and chemical properties(reactivity and reaction mechanism) and basics of stereochemistry and basics of drug activities in relation to stereochemistry and Chemical bonding. In addition it deals with Chemistry of Aromatic Compounds; Carbonyl Reactions; Introduction to biological molecules

**Course Objectives:**

Upon completion of this course the students would be able to: discuss the chemical bonding theories and influence of bonding types on properties of compounds predict the existence of the kinds of stereo isomers, represent and designate their structures determine the stereochemistry of organic molecules describe the factors affecting reaction rates and explain mechanisms in organic reactions give systematic name to different organic compounds review of the classes of organic compounds explain the physical and chemical behaviors of organic compounds based on their functional groups explain the properties, preparation and reactions of aromatic compounds discuss different types of reactions of carbonyl compounds describe different classes of Biological molecules.

## Supporting Objectives:

- Familiar with types of bonding and principle of formation and hybridization
- Explain the structures of organic compounds.
- Familiar with the most important classes of organic functional groups and their physical and chemical properties.
- Use the rules of nomenclature to give correct names for organic compounds
- Draw correct structures that correspond to a name, and correctly use and recognize common names.
- Use principles of stereochemistry to locate stereocenters and label stereoisomers,
- Identify chiral compounds, give stereochemical relationships between molecules,
- Use Fischer projections, solve optical activity problems, and identify stereochemical results of a reaction.
- Be able to identify typical chemical reactions on the basis of their structure and properties
- Give starting materials, reagents, and products for reactions of organic compounds.
- Classify various biological molecules such as carbohydrates, lipids, amino acids and proteins, and their important chemical properties.

## Course mode of delivery: Block/Parallel

### Learning activities and teaching methods

Interactive lectures, case studies, computer assisted learning, formative problem-solving exercises, self-directed learning through virtual learning environment and technologies, practical activities and assignments.

### Assessment techniques:

Assignments and Seminars; 15%

Quizzes: 35%

Final-exam: 50%

### Teachers and Students Role

#### Teacher's role

Course instructors are expected to:

- Provide lecture and guide students
- Providing assignments to be done and feedback for students
- Prepare lecture note, Assignment topics and title for group discussions
- Select seminar title and advice students in preparation and presentations
- Prepare assessing questions and examine students
- Organize laboratory sessions and demonstrate some laboratory activities
- Prepare laboratory manuals

#### Student's role

Students are expected to:

- Read text books, lecture handouts and reference books
- Be an active participant in class discussion (ask questions and answering questions)

- Prepare paper under the title given for seminars, assignments and present it
- Analyze and evaluate different literatures, reference books and journal articles
- Perform laboratory activities
- Write laboratory reports
- Taking exams

### References:

- Organic reaction Mechanisms 1993. A.C. Knope and w.E. Watts, University of Ulster Northern Ireland.
- Organic reaction Mechanisms, Ronald Brewlow, Columbia University, second edition.
- Organic Chemistry. Graham solomons, 6th ed, Univ of South Florida.
- A textbook of Organic Chemistry, K.S. Tewair, S.N. Mehrotra, N.K. Vishnoi

### Course Schedule:

Course Content	
<ol style="list-style-type: none"> <li>1. Structure               <ol style="list-style-type: none"> <li>1.1. Energy levels and Atomic orbital</li> <li>1.2. Covalent bonds</li> <li>1.3. Molecular orbital theory</li> <li>1.4. Orbital hybridization</li> </ol> </li> <li>2. Nomenclature               <ol style="list-style-type: none"> <li>2.1. Alkanes</li> <li>2.2. Alkenes and Alkynes</li> <li>2.3. Alcohols</li> <li>2.4. Aldehydes</li> <li>2.5. Ketones</li> <li>2.6. Amines</li> <li>2.7. Ethers</li> <li>2.8. Aromatics</li> </ol> </li> <li>3. Stereochemistry               <ol style="list-style-type: none"> <li>3.1. Symmetry and dissymmetry</li> <li>3.2. The asymmetric carbon</li> <li>3.3. Optical isomerism</li> <li>3.4. Fischer projections</li> <li>3.5. Multiple asymmetric centers</li> <li>3.6. Configuration</li> </ol> </li> <li>4. Substitution reactions               <ol style="list-style-type: none"> <li>4.1. SN1 and SN2 mechanisms</li> <li>4.2. Applications of substitution Reactions</li> </ol> </li> </ol>	

- 4.2.1. Alcohols
- 4.2.2. Ethers
- 4.2.3. Carboxylic acids
- 4.2.4. Alkanes, Alkenes, and Alkynes
- 4.2.5. Amines
- 4.2.6. Epoxide Ring opening
- 4.2.7. Reactions of malonic ester and acetoacetic ester

## 5. Elimination reactions

- 5.1. Mechanisms
- 5.2. Evidences for mechanisms of elimination reaction
- 5.3. E1 versus E2
- 5.4. Elimination versus substitution
- 5.5. Applications of elimination reactions
  - 5.5.1. Dehydration of Alcohols
  - 5.5.2. Dehydrohalogenation of alkylhalides
  - 5.5.3. Vicinal Dihalides
  - 5.5.4. Hofmann Elimination
  - 5.5.5. Acetate pyrolysis
  - 5.5.6. Cope reaction

## 6. Addition Reactions

- 6.1. Mechanism
- 6.2. Reactivity
- 6.3. Rules of addition reactions
  - 6.3.1. Markovnikov Rule
  - 6.3.2. Michael Addition
  - 6.3.3. Radical addition
- 6.4. Applications of Addition Reactions
  - 6.4.1. Addition of halogen
  - 6.4.2. Addition of hydrogen halide
  - 6.4.3. Addition of hypohalous acids
  - 6.4.4. Hydration of alkenes
  - 6.4.5. Hydroboration
  - 6.4.6. Diels-Alder addition
    - 6.4.6.1. Kinetic vs Thermodynamic control of the Diels-Alder reaction
    - 6.4.6.2. Stereochemistry of the Diels-Alder reaction
  - 6.4.7. Catalytic hydrogenation
  - 6.4.8. Ozonization
  - 6.4.9. Peracid oxidation

6.4.10. Glycol formation

7. Aromatic substitution reactions
  - 7.1. Introduction
  - 7.2. Aromaticity
  - 7.3. Aromatic substitution
  - 7.4. Directing effects
  - 7.5. Application of electrophilic substitutions
    - 7.5.1. Halogenation
    - 7.5.2. Sulfonation
    - 7.5.3. Nitration
    - 7.5.4. Friedel-Crafts Alkylation
    - 7.5.5. Friedel-Crafts Acylation
    - 7.5.6. Diazotization of Amines
    - 7.5.7. Reactions of aromatic side chains
8. Carbonyl reactions
  - 8.1. Carbonyl addition
  - 8.2. Addition Elimination
  - 8.3. Enolization Ketonization
  - 8.4. Application of Addition reactions
    - 8.4.1. Hydrate formation
    - 8.4.2. Hemiacetals and Hemiketals
    - 8.4.3. Cyanohydrins
    - 8.4.4. Carbinolamines
    - 8.4.5. addition of Grignard reagents
    - 8.4.6. Addition of hydrogen
    - 8.4.7. Lithiumaluminiumhydride and sodiumborohydride
  - 8.5. Application of addition-elimination reactions
    - 8.5.1. Imines and related compounds
    - 8.5.2. Wittig reaction
    - 8.5.3. Acetal and ketal formation in acid media
    - 8.5.4. Acids and their derivatives
    - 8.5.5. Ester hydrolysis and formation in acid media
    - 8.5.6. Acid chlorides
    - 8.5.7. Acid anhydrides
    - 8.5.8. Reduction of acid derivatives
  - 8.6. Application of enolization-ketonization reactions
    - 8.6.1. Halogenation
    - 8.6.2. Alkylation
    - 8.6.3. aldol condensation

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| <ul style="list-style-type: none"> <li>8.6.4. Claisen-Schmidt condensation</li> <li>8.6.5. Mannich condensation</li> <li>8.6.6. Perkin condensation</li> <li>8.6.7. Claisen condensation</li> <li>9. Rearrangement reactions <ul style="list-style-type: none"> <li>9.1. Rearrangement to an electro-deficient carbon</li> <li>9.2. Rearrangement to an electro-deficient oxygen</li> <li>9.3. Rearrangement to an electro-deficient nitrogen</li> </ul> </li> <li>10. Oxidation-reduction reaction <ul style="list-style-type: none"> <li>10.1. Introduction</li> <li>10.2. Oxidation reaction <ul style="list-style-type: none"> <li>10.2.1. Alcohols</li> <li>10.2.2. Aldehydes</li> </ul> </li> <li>10.3. Reduction Reactions <ul style="list-style-type: none"> <li>10.3.1. Catalytic hydrogenation</li> <li>10.3.2. Chemical Reduction</li> <li>10.3.3. Dissolving metal reductions</li> <li>10.3.4. Acyloin condensation</li> </ul> </li> </ul> </li> <li>11. Electrocyclic Reactions <ul style="list-style-type: none"> <li>11.1. Molecular Orbitals</li> <li>11.2. Electrocyclic reactions</li> <li>11.3. Stereospecificity of cyclic reactions</li> </ul> </li> <li>12. Biological molecules <ul style="list-style-type: none"> <li>12.1. Glucose: An introduction to carbohydrate chemistry</li> <li>12.2. Disaccharides and polysaccharides</li> <li>12.3. Amino-acids, peptides, and proteins <ul style="list-style-type: none"> <li>12.3.1. The structure and properties of alpha-amino acids</li> <li>12.3.2. Analysis of alpha-amino acids</li> <li>12.3.3. Synthesis of alpha-amino acids</li> </ul> </li> <li>12.4. Peptides and proteins</li> <li>12.5. Peptide synthesis</li> </ul> </li> <li>13. Biological transformation <ul style="list-style-type: none"> <li>13.1. Glycolysis</li> <li>13.2. Thiamine</li> <li>13.3. Tricarboxylic acid cycle</li> <li>13.4. Vitamin B6-Transamination</li> <li>13.5. Mechanism of chymotrypsin action storage of metabolic energy</li> <li>13.6. Generation and storage of metabolic energy</li> </ul> </li> </ul> |  |
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13.7. Biosynthetic pathways	
<b>Total</b>	<b>48</b>

### **Chemistry Module syllabi**

**Course title:** Organic Chemistry Laboratory

**Course code:** Chem 1042

**Module name:** Chemistry module

**Module code:** Chem-M1043

**Course mode of delivery:** Block/Parallel

### **Learning activities and teaching methods**

Interactive lectures, case studies, computer assisted learning, formative problem-solving exercises, self-directed learning through virtual learning environment and technologies, practical activities and assignments.

### **Assessment techniques:**

- Active participation in laboratory activities; 20%
- Laboratory activity report: 40%
- Final Practical exam: 40%

### **Teachers and Students Role**

#### **Teacher's role**

Course instructors are expected to:

- Organize laboratory sessions and demonstrate some laboratory activities
- Prepare laboratory manuals

#### **Student's role**

Students are expected to:

- Perform laboratory activities
- Write laboratory reports
- Taking exams

### **Course description:**

This course is intended to provide the students with basic principles of selected experiments to be conducted on different classes of organic functional groups ( alkanes,

, alkenes, and alkynes, alkyl halides, alcohols, ethers, aromatic rings, ketones, aldehydes, carboxylic acids and their derivatives, amines biomolecules(carbohydrates, proteins, lipids and nucleic acid) with a special focus on their physical properties (boiling point, melting point, solubility,) and chemical properties(reactivity and reaction mechanism) and basics of stereochemistry and basics of drug activities in relation to stereochemistry and Chemical bonding.

### **Course Objectives:**

- Upon completion of this course the students would be able to: conduct selected experiments to purify a contaminated solid compounds, determine melting point of a solid substances, to separate a mixtures of two liquids by fractional distillation, to study the characteristics of chemical properties of some functional groups, prepare acetylsalicylic acid, prepare ordinary soap and examine its properties, learn the roles of chromatographic techniques in separation and identification of organic compounds, and examine the chemical and physical properties of proteins and carbohydrates.

### **Supporting Objectives:**

- To purify a contaminated solid compound by recrystallization
- To determine the melting point of a solid substance obtained from previous experiment
- To purify a contaminated liquid by simple distillation
- To separate a mixture of two liquids by fractional distillation
- To study the characteristic chemical properties of some functional groups
- To observe three dimensions structure of molecules by constructing models of different compounds
- To prepare acetylsalicylic acid, commonly known as “aspirin”
- To prepare ordinary soap and examine its properties
- To learn the use of chromatographic techniques in the separation and identification of organic compounds

- To examine the chemical and physical properties of two important classes of food namely proteins and carbohydrates

Experiment 1: Recrystallization

Experiment 2: Determination of melting point

Experiment 3: Simple distillation

Experiment 4: Fractional distillation

Experiment 5: Survey of some functional groups

Experiment 6: The third dimension in organic chemistry

Experiment 7: Preparation of aspirin

Experiment 8: Preparation of soap

Experiment 9: Chromatography

Experiment 10: Introduction to proteins and carbohydrates

**Module 5: Biomedical Sciences-II****Module name:** Biomedical science II**Module category:** Basic**Module code:** Biom-M2053**Module Number: 05****Module weight in ECTS:** 27**Courses:**

Course Name	Course Code	ECTS
Biochemistry I	Bioc 1051	5
Biochemistry II	Bioc 1052	5
Microbiology, immunology and parasitology	Mbio1053	7
Pathology	Path2054	5
Human Physiology-II	Phyl2055	5

**Module description**

The module provides students with basic knowledge and understanding of the normal chemical and metabolic processes of the body and how this is affected by certain disorders; knowledge of the molecular basis of certain types of diseases, and the biochemical basis of drug actions and effects of toxins; help the student to understand and appropriately identify biochemical disorders and recommend specific treatment regimen. This module is also designed to enable the students understand the background to the development of microbiology; classification, nomenclature, microscopic characterization and morphology, reproduction and growth of microorganisms and parasitic agents. It also explains the cultivation techniques and nutritional requirements of microorganisms. The immunology part helps the student learn about the basis of immunity, preparation and characterization of antibodies, the mechanism of antibody-antigen reactions and diagnostic applications of immunological principles. The practical sessions include identification of bacteria, staining techniques, media and culture preparation, sterilization, antibiotic testing, assay and sensitivity test

**Module objective:** This module provides students with basic understanding of; the normal chemical and metabolic processes of the body and how this is affected by certain disorders; identification and

characterization of different type of microbial and parasites and also the disease they cause; basics of immunological principle

**Module competency:**

- Apply the concept of Biochemistry to drug therapy
- Apply knowledge of common disease causing organism to drug therapy

**Module mode of delivery:** Blocked for biochemistry courses and parallel for Microbiology and immunology course

**Module mode of Assessment:**

Quizzes

Mid exam

Final Exam

Seminar

Laboratory

Assignment

**Module learning teaching methods**

Active learning methods (brain storming, buzz group, discussion, etc), Lecture, group & individual presentation, assignment, project work, and laboratory work.

**Course title:** Biochemistry I

**Course code:** Bioc. 2051

**Module name:** Biomedical II module

**Module code:** Biom-M2053

**Course ECTS:** 5 (135 hrs)

- Lecture: 48 hours
- Tutorial: 9 hours
- Home study: 60 hours
- Assignment and presentation: 18 hours

**Year/Semester Course is offered:** Year II Semester I

**Contact hours/ week:** 135-87= 48 hours/ 16 weeks= 3 hours

**Pre-requisite if any:** Organic Chemistry

**Course description:**

This Biochemistry course is designed to prepare B.Sc. graduate anesthesia students who are competent providers of anesthesia services. Students will be able to explain the biochemical aspects of human life & describe the biochemistry of carbohydrates, proteins, lipids and nucleic acids. It contains only the theoretical part that the trainee should pass through to acquire the basic competence in accomplishing organizational activities relating to its coverage.

**Course objectives:**

- After completing this course, the student will be able to explain the biochemical aspects of human life; describe the chemistry and metabolism of biomolecules (carbohydrates, lipids, proteins and nucleic acids); explain central metabolism; outline the transmission & expression of genetic information and correlate the biochemical processes with health & disease.

**Specific Objectives:**

1. Describe the structure and classification of carbohydrates
2. Outline the metabolic pathways for anaerobic glycolysis, pentose shunt, and gluconeogenesis, including substrates, unique enzymes and regulatory mechanisms.
3. Outline the metabolic pathways for synthesis and degradation of glycogen.
4. Differentiate the structure and composition of lipids.

5. Describe the composition and functions of different lipoproteins present in plasma.
6. Outline the sequence of reactions involved in oxidation of fatty acids in the mitochondrion.
7. Explain the rationale for the pathway of ketogenesis and identify the major intermediates and products of this pathway.
8. Describe the synthesis of fatty acids and triglycerides.
9. Outline the sequence of reactions in the tri carboxylic acid cycle and explain the purpose of the cycle.
10. Outline the mitochondrial electron transport system and define membrane potential and explain its role in ATP synthesis and thermogenesis.
11. Describe the structure and classification of amino acids & proteins.
12. Describe the mechanism of oxygen binding to myoglobin and hemoglobin.

**Course mode of delivery: Block/Parallel**

**Course learning and teaching methods:**

- Active learning methods (brain storming, discussion, etc), Lecture, group and individual presentation, assignment.

**Assessment techniques:**

Continuous assessment & summative assessment

- Class attendance (%)
- Quiz (%)
- Assignments (%)
- Final Exam (50)

**Teachers and Students Role**

**References:**

■ **Textbook:**

- ▶ Pamela C.C, and Richard A.H., Lippincott's Illustrated Reviews: Biochemistry, 3<sup>rd</sup> edition, J.B.Lippincott Company Philadelphia, 2004.

**Recommended Reading**

1. Stryer L. et al. Biochemistry, 5<sup>th</sup> edition, W.H. Freeman and Company & Sumanas, Inc., 2004.
2. Murray R.K et al. Harper's Illustrated Biochemistry 27<sup>th</sup> edition, The McGraw-Hill Companies, Inc., 2006.

3. Lehninger A.L. Principles of Biochemistry, CBS publishers and distributors, 2006.
4. Lieberman M. et al. Marks' Essential Medical Biochemistry, 2<sup>nd</sup> Edition, Lippincott Williams & Wilkins, 2007.
5. Zubay P. et al. Principles of Biochemistry, W.M.C. Brown Publishers USA, 1995.
6. Smith E.L et. al., Principles of Biochemistry, McGraw-Hill-International, 1993 or recent edition.

**Course Schedule:** By contact time, contents/topics & reading/reference materials for each topic

Week	Contact hrs	Topic/sub-topic/chapter	Reading materials
1	2	1. INTRODUCTION TO BIOCHEMISTRY – Introduction: <ul style="list-style-type: none"> <li>• Definitions</li> <li>• Role of biochemistry</li> </ul> – Cellular components – Brief introduction to metabolism & Enzymes	Lehninger Principles of Biochemistry (Page No. 3-12)
1-2		2. WATER & pH – Role of water in biological system – Acid base theories <ul style="list-style-type: none"> <li>• Definition of pH, pKa and pKb</li> </ul> – Buffers & Acid-base balance	Harper's Biochemistry (Page No. 5-13)
3-7	15	3. CARBOHYDRATES – Structure & classification of carbohydrates – Digestion & absorption of carbohydrates – Metabolism of carbohydrates: <ul style="list-style-type: none"> <li>• Glycolysis</li> <li>• Oxidation of pyruvate</li> <li>• Pentose phosphate pathway</li> </ul>	Lehninger Principles of Biochemistry (page No. 239-255) Harper's Biochemistry Page No. 130-136, 136-163)



		<ul style="list-style-type: none"> <li>• Glycogen metabolism</li> <li>• Gluconeogenesis</li> <li>• Metabolism of major non-glucose sugars</li> </ul> <p>Regulation of blood glucose</p>	
8-12	15	<p>4. LIPIDS</p> <ul style="list-style-type: none"> <li>– Structure and classification of lipids</li> <li>– Biological membranes</li> <li>– Digestion &amp; absorption of lipids</li> <li>– Metabolism of fatty acids: <ul style="list-style-type: none"> <li>• Biosynthesis and storage of fatty acids</li> <li>• Oxidation of Fatty Acids</li> <li>• Ketogenesis &amp; Ketolysis</li> </ul> </li> <li>– Lipid transport and storage: <ul style="list-style-type: none"> <li>• Structure and function of Lipoproteins</li> </ul> </li> <li>– Cholesterol synthesis, transport, &amp; excretion</li> </ul>	<p>Harper's Biochemistry (Page No. 111-122)  Pamela C.C. (Page No. 163-205)</p>
13-14	6	<p>5. CENTRAL METABOLISM</p> <ul style="list-style-type: none"> <li>– Tricarboxylic acid (Krebs') cycle</li> <li>– Bioenergetics (thermodynamics): <ul style="list-style-type: none"> <li>• Related to nutrition and obesity</li> <li>• The Electron transport system</li> <li>• Oxidative phosphorylation</li> </ul> </li> </ul>	<p>Pamela C.C. (Page No. 105-109)  Harper' Biochemistry (Page No. 92-102)</p>

15-16	6	<p>6. AMINO ACIDS AND PROTEINS</p> <ul style="list-style-type: none"> <li>- Structure and classification of amino acids <ul style="list-style-type: none"> <li>• Physico-chemical properties of amino acids</li> </ul> </li> <li>- Structure &amp; functions of proteins <ul style="list-style-type: none"> <li>• Mechanism of oxygen binding to myoglobin and hemoglobin.</li> </ul> </li> </ul>	<p>Pamela C.C. (Page No. 229-267) Harper's Biochemistry (Page No. 249-264)</p>
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**Course title:** Biochemistry II

**Course code:** Bioc 2052

**Module name:** Biomedical II module

**Module code:** Biom-M2053

**Course ECTS:** 5 (135 hrs)

- Lecture: 48 hours
- Tutorial: 9 hours
- Home study: 60 hours
- Assignment and presentation: 18 hours

**Contact hours/ week:**  $135-87=48$  hours/ 16 weeks= 3 hours

**Pre-requisite if any:** Organic Chemistry

**Course description:**

- This Biochemistry course is designed to prepare B.Sc. graduate anesthesia students who are competent providers of anesthesia services. Students will be able to explain the biochemical aspects of human life & describe the biochemistry of carbohydrates, proteins, lipids and nucleic acids. It contains only the theoretical part that the trainee should pass through to acquire the basic competence in accomplishing organizational activities relating to its coverage.

**Course Objectives:**

- After completing this course, the student will be able to explain the biochemical aspects of human life; describe the chemistry and metabolism of biomolecules (carbohydrates, lipids, proteins and nucleic acids); explain central metabolism; outline the transmission & expression of genetic information and correlate the biochemical processes with health & disease.

**Specific Objectives:**

1. Describe the structure and classification of amino acids & proteins.
2. Describe the mechanism of oxygen binding to myoglobin and hemoglobin.
3. Describe the mechanisms used by humans for removal of the nitrogen from amino acids prior to the metabolism of their carbon skeletons.
4. Discuss the structure and composition of enzymes, including cofactors, and conditions that affect enzymatic reactions.

5. Compare and contrast the structure and biosynthesis of purines and pyrimidines, highlighting the differences between de novo and salvage pathways.
6. Describe the compositions and structures of DNA and RNA.
7. Explain how replication of DNA is achieved with high fidelity in a bidirectional manner and in a semi-conservative fashion.
8. Describe the major steps in transcription of an RNA molecule.
9. Describe how the different RNAs involved in protein synthesis interact to produce a polypeptide.

**Delivery mode/methodology: Block**

**Course learning and teaching methods**

- Active learning methods (brain storming, discussion, etc), Lecture, group and individual presentation, assignment

**Assessment mechanisms:**

Continuous assessment & summative assessment

- Class attendance (%)
- Quiz (%)
- Assignments (%)
- Final Exam (50%)

**Teachers and Students Role**

**References:**

■ **Textbook:**

- ▶ Pamela C.C, and Richard A.H., Lippincott's Illustrated Reviews: Biochemistry, 3<sup>rd</sup> edition, J.B.Lippincott Company Philadelphia, 2004.

■ **Recommended Reading:**

1. Stryer L.et al.Biochemistry,5<sup>th</sup> edition, W.H. Freeman and Company &Sumanas, Inc., 2004.
2. Murray R.K et al. Harper's Illustrated Biochemistry 27<sup>th</sup> edition,The McGraw-Hill Companies, Inc., 2006.
3. Lehninger A.L. Principles of Biochemistry, CBS publishers and distributors, 2006.
4. Lieberman M. et al.Marks' Essential Medical Biochemistry, 2<sup>nd</sup> Edition,Lippincott Williams & Wilkins, 2007.

5. Zubay P. et al. Principles of Biochemistry, WM.C. Brown Publishers USA, 1995.
6. Smith E.L et. al., Principles of Biochemistry, McGraw-Hill-International, 1993 or recent edition.

**Course Schedule:** By contact time, contents/topics & reading/reference materials for each topic

- 7.

1-7	20	<p>1. AMINO ACIDS AND PROTEINS</p> <ul style="list-style-type: none"> <li>• Digestion &amp; absorption of proteins</li> <li>• Metabolism of proteins &amp; amino acids: <ul style="list-style-type: none"> <li>○ Biosynthesis of nonessential amino acids</li> <li>○ Catabolism of Proteins &amp; of Amino Acid Nitrogen- Urea cycle</li> <li>○ Catabolism of the carbon skeletons of amino acids</li> <li>○ Conversion of amino acids to specialized products</li> <li>○ Metabolism of Haem:</li> <li>○ Porphyrins &amp; Bile Pigments</li> </ul> </li> </ul>	<p>Pamela C.C. (Page No. 229-267) Harper's Biochemistry (Page No. 249-264)</p> <p>Harper's Biochemistry (Page No- 270-286)</p>
7-9	6	<p>8. VITAMINS</p> <ul style="list-style-type: none"> <li>– Classification of vitamins</li> <li>– Structure and function of: <ul style="list-style-type: none"> <li>• Water &amp; Fat soluble vitamins</li> </ul> </li> </ul>	<p>Harper's Biochemistry (Page No. 49-72) Pamela C.C. (Page No. 47-58)</p>

9-16	18	<p>9. MOLECULAR BIOLOGY</p> <ul style="list-style-type: none"> <li>– Nucleotide structure</li> <li>– Biosynthesis &amp; Degradation of nucleotides</li> <li>– DNA structure and Replication</li> <li>– RNA structures and Transcription</li> <li>– Protein Synthesis: <ul style="list-style-type: none"> <li>• The Genetic Code</li> <li>• Translation</li> </ul> </li> <li>– Mutation</li> <li>– Regulation of gene expression in <ul style="list-style-type: none"> <li>• Prokaryotes</li> <li>• Eukaryotes</li> </ul> </li> </ul>	<p>Pamela C.C. (Page No. 319-330) Harper's Biochemistry (Page No. 481-497)</p>
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**Course title: Microbiology, Parasitology & immunology**

**Course code: Mbio2053**

**Module name: Biomedical II module**

**Module code: Biom-M2053**

**Course ECTS: 7 (189 hrs)**

Lecture: 48 hrs

Tutorial: 20 hrs

Lab practice: 48 hrs

Home study individual work: 45 hrs

Total: 189 hrs

**Year/Semester Course is offered: Year II Semester I**

**Contact hours/ week: 135-87= 48 hours/ 16 weeks= 3 hours**

**Pre-requisite if any: Medical Physiology, Medical Biochemistry and Human Anatomy**

**Course description:**

The course includes Introduction to microbiology, theories on origin of microorganisms, classification of microorganisms, morphology and cytology of bacteria, host parasite relationship, common pathogenic bacteria, introduction to immunology, introduction to mycology and virology.

**Course objectives:**

- This course helps the students:
- To understand brief history of Medical Microbiology and important events, discoveries and inventions significantly contributed to its development as a science.
- To appreciate the relationship between microbes, the immune system, and disease outcomes.
- To understand how the immune system functions in a specific and non-specific way, to defend the host against infections by bacteria, fungi and viruses.
- To recognize the structural components of microbes (bacteria, fungi, parasites and viruses) and how these impact the pathogenesis of disease.
- To explain the methods of microorganisms control ( chemotherapy & vaccines, disinfection and sterilization )



- To know the common microorganisms associated with specific clinical diseases and what factors are involved in pathogenesis.
- To appreciate the role of immune system in allergic diseases.
- To appreciate the role of the clinical laboratory in diagnosis and management of infectious diseases.
- To develop the ability to correlate the clinical picture with laboratory information to establish a diagnosis and select for appropriate treatment options.
- To understand mechanism of action of anti-microbial agents
- To appreciate mechanisms how microbes resist anti-microbial agents
- Discuss the concepts of parasitism, the relationships between parasites and host, between parasites and environment
- Recognize the general epidemiological aspects of parasites that affect human
- Illustrate the life cycle of specific parasites and identify the important parasitic agent affecting human health
- Describe some important arthropods responsible for the transmission of disease causing parasites
- Describe commonly used methods for microscopic examination of parasites
- Describe the transmission and pathogenesis of helminthes infections
- Describe the basic concepts and principles how to control protozoan infections.

**Course mode of delivery: Block/Parallel**

**Course learning and teaching methods:**

- Classroom contact/Lecture
- Presentation and group discussion
- Computer assisted instruction

**Assessment techniques:**

- Four individual assignments 10%
- Two exams (15%)
  - Exam 1 15% week 7
  - Exam 2 15% week 10
- Mid Exam 30%.

- Final exam 40 % Week 16

## Teachers and Students Role

### References:

- Markell, Voge, Jhon. Medical Parasitology. 6<sup>th</sup> ed. 1986. W.b. Saunders Company.
- Paul Chester Beaver, Rodney Clifton jung, Eddie Wayne Cupp. Clinical Parasitology. 9<sup>th</sup> ed. 1984. K.M. Varghese company
- Herbert M. Gilles. Protozoal Diseases. 1999. Arnold
- David L. Belding. Text book of Parasitology. 3<sup>rd</sup> ed. 1965.
- Monica Cheesbrough. District Laboratory Practice in Tropical countries. Part I -2<sup>nd</sup>ed updated. 1998. Tropical Health Technology. Cambridge
- Judith S. Heelan, Frances W. Ingersoll. Essentials of Human Parasitology. 2002. Delmar Thomson Learning
- VigarZaman. Atlas of Medical Parasitology. 1979
- Harold W. Brown, Franklin A. Neva. Basic Clinical Parasitology. 5<sup>th</sup> ed. 1983
- Mohammed AwolAdem and WaqtolaCheneke. Medical Parasitology: Lecture note for medical laboratory technology students: upgraded lecture note serious. 2006
- Modern Parasitology A text book of Parasitology ( Cox 2<sup>nd</sup>edn)
  - Clinical parasitology (Beaver et. al 9<sup>th</sup>ed.)
  - Atlas of Medical Helminthology and Protozoology (Jaffee and Leach 2<sup>nd</sup> edition)
  - District laboratory practice in tropical counties (Monica CheesbroughVol I)
  - Essentials of Parasitology (Murray D. Dailey 6<sup>th</sup> ed. 1996)
  - Essentials of parasitology (Gerald D. Schmidt 4<sup>th</sup> ed. 1994)
  - Parasitology for medical Laboratory Technology students – Lecture note series (GirmaM. and Mohammed A. 2003)
  - Craig ad Faust’s clinical parasitology (Ernest C. Faust 8<sup>th</sup> ed. 1977)
  - Web materials - DPDX



<p>Course objective and competences to be acquired</p>	<ul style="list-style-type: none"> <li>○ This course helps the students:</li> <li>○ To understand brief history of Medical Microbiology and important events, discoveries and inventions significantly contributed to its development as a science.</li> <li>○ To appreciate the relationship between microbes, the immune system, and disease outcomes.</li> <li>○ To understand how the immune system functions in a specific and non-specific way, to defend the host against infections by bacteria, fungi and viruses.</li> <li>○ To recognize the structural components of microbes (bacteria, fungi, parasites and viruses) and how these impact the pathogenesis of disease.</li> <li>○ To explain the methods of microorganisms control ( chemotherapy &amp; vaccines, disinfection and sterilization )</li> <li>○ To know the common microorganisms associated with specific clinical diseases and what factors are involved in pathogenesis.</li> <li>○ To appreciate the role of immune system in allergic diseases.</li> <li>○ To appreciate the role of the clinical laboratory in diagnosis and management of infectious diseases.</li> <li>○ To develop the ability to correlate the clinical picture with laboratory information to establish a diagnosis and select for appropriate treatment options.</li> <li>○ To understand mechanism of action of anti-microbial agents</li> </ul>
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● To appreciate mechanisms how microbes resist anti-microbial agents

- To enhance critical thinking and problem-solving skills and the ability to effectively communicate with and work with peers
- Discuss the concepts of parasitism, the relationships between parasites and host, between parasites and environment
- Recognize the general epidemiological aspects of parasites that affect human

				<ul style="list-style-type: none"> <li>○ Illustrate the life cycle of specific parasites and identify the important parasitic agent affecting human health</li> <li>○ Describe some important arthropods responsible for the transmission of disease causing parasites</li> <li>○ Describe commonly used methods for microscopic examination of parasites</li> <li>○ Describe the transmission and pathogenesis of helminthes infections</li> <li>○ Describe the basic concepts and principles how to</li> </ul>
Course Description	The course includes Introduction to microbiology, theories on origin of microorganisms, classification of microorganisms, morphology and cytology of bacteria, host parasite relationship, common pathogenic bacteria,introduction to immunology, introduction to mycology and virology			
Pre-requisite(s)	Medical Physiology , Medical Biochemistry and Human Anatomy			
Course status	Supportive			
Course outline and schedules				
Week	Date	Contact Hours	Topics	Reference materials
1 <sup>st</sup> - 2 <sup>nd</sup> week		4hrs	<p>Introduction to Medical Microbiology</p> <p><i>Enabling objectives</i></p> <ul style="list-style-type: none"> <li>• Define microbes in the words of Leeuwenhoek and as we know them today.</li> <li>• Compare &amp; contrast prokaryotic and eukaryotic cells</li> <li>• Compare and contrast the structures and functions</li> </ul>	<p><u>Burton's Microbiology for the Health Sciences, Ninth Edition, 2011(chap 1)</u></p> <p>Hugo and Russell's</p>

			<ul style="list-style-type: none"> <li>• offimbriae, pili, and flagella</li> <li>• Compare and contrast the cell walls of acid-fast bacteria with typical Gram- positive cell walls</li> <li>• Describe the relationships among the terms parasite, host, and pathogen</li> <li>• Identify and describe the portals through which pathogens invade the body</li> <li>• Compare and contrast the terms infection, disease, morbidity, pathogenicity, and virulence</li> </ul> <p>Topics (to be lectured)</p> <ul style="list-style-type: none"> <li>• Definition of microbiology</li> <li>• Theories and origin of microorganisms</li> <li>• The germ theory of diseases</li> <li>• Classification of microorganism</li> <li>• Morphology and cytology of bacteria</li> <li>• nutrition and growth of bacteria</li> <li>• Disinfection and sterilization</li> <li>• Host parasite relationships</li> <li>• Anti-microbial chemotherapy</li> <li>• Laboratory Practice (12 Hrs)</li> </ul>	<p>4<sup>th</sup> ed. Chapt 3 &amp;4.</p>
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			<ul style="list-style-type: none"> <li>• Demonstration of microbiology and parasitology laboratory(3Hrs)</li> <li>• Simple staining (3Hrs)</li> <li>• Gram staining(3Hrs)</li> <li>• Zehl-nelson staining(3Hrs)</li> </ul> <p>Reading assignment</p> <ul style="list-style-type: none"> <li>• <i>Glucose metabolism in bacteria</i></li> <li>• <i>Mechanism of action of anti-protozoan drugs</i></li> <li>• <i>Mechanism of action of anti-fungal drugs</i></li> <li>• <i>Mechanism of action of anti-helminthic drugs</i></li> </ul>	
	2 <sup>nd</sup>		1 <sup>st</sup> written Examination (10%)	
3 <sup>rd</sup> -6 <sup>th</sup> week	w		1 <sup>st</sup> practical examination General Immunology <i>Enabling objectives</i> <ul style="list-style-type: none"> <li>• List and briefly describe the three lines of defense in the human body.</li> <li>• Define normal microbiota, and explain how they help provide protection against disease</li> <li>• Discuss about immune cells and their functions in the body's defense</li> </ul>	Roitt's Essential immunology,2006



			<ul style="list-style-type: none"> <li>• Name and describe the six stages of phagocytosis</li> <li>• Discuss the process and benefits of inflammation</li> <li>• Describe five distinctive attributes of adaptive immunity</li> <li>• List two basic divisions of adaptive immunity, and describe their targets</li> <li>• Topics</li> <li>• Introduction to immunology</li> <li>• Cells and tissues of the immune system</li> <li>• The basis of immunity(Innate immunity, Adaptive immunity)</li> <li>• Cell mediated immunity</li> <li>• Humoral immunity</li> <li>• The recognition of antigen</li> <li>• ,the acquired immune response classification and types of acquired immunity</li> <li>• Antigens antibodies and complement system</li> <li>• Types of antigens</li> <li>• Immunoglobulins</li> <li>• Cellular basis of antibody formation</li> </ul>	
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			<ul style="list-style-type: none"> <li>• Antigen antibody reaction</li> <li>• Haptens and immunoglobulins</li> <li>• The major histocompatibility complex(MHC type I and II)</li> <li>• Immunodeficiency (secondary to drugs nutrition, AIDS)</li> <li>• Allergic diseases(hypersensitivity reactions, anaphylaxis and urticaria, drug</li> </ul>	
week 7			<ul style="list-style-type: none"> <li>• 2<sup>nd</sup> Examination</li> <li>• Written examination (10%)</li> </ul>	
Week 7 week 8 Week 9 Week 10 Week 11		10Hrs	<ul style="list-style-type: none"> <li>• Common pathogenic Bacteria</li> <li>• Enabling objectives</li> <li>• Discuss the virulence factors of Staphylococcus that enable it to be pathogenic, contrasting the virulence of <i>S. aureus</i> with that of <i>S. epidermidis</i></li> <li>• Topics</li> <li>• Staphylococci</li> <li>• Streptococcus and pneumococcus</li> <li>• Bacillus ,clostridia nad corvebactera</li> </ul>	<p>Harrisons infectious diseases,( Derived from Harrison's Principles of Internal Medicine, 17th Edition),2010 ,page 353</p> <p>Solomon Geber-selassie et al. Medical microbiology</p>

			<ul style="list-style-type: none"> <li>• Enterobacteriaceae</li> <li>• vibrio</li> <li>• Nesireia</li> <li>• Hemophilus</li> <li>• Neisera</li> <li>• Hemophilus, Bordetella and</li> <li>• Brucella</li> <li>• Mycobacteria</li> <li>• Spirochetes</li> <li>• Rickettsiae</li> <li>• Chlamydia</li> <li>• Laboratory Practice</li> <li>• Preparation of culture media(3Hrs)</li> <li>• Specimen inoculation(3Hrs)</li> <li>• Identification (3Hrs)</li> <li>• Drug Sensitivity</li> <li>• Testing(3Hrs)</li> <li>• Demonstration of preserved slides for Boriella species and acid fact bacilli(3Hrs)</li> <li>• Widal test (3Hrs) Reading assignment</li> <li>• <i>Genus Legionella and listeria</i></li> <li>• <i>Serologic tests used for the diagnosis bacterial infections</i></li> </ul>	Medical microbiology 4 <sup>th</sup> ed 2002
Week 12			Examination 3 Written examination (20%)	

			Practical examination (7%)	
Week 13		2 Hrs	<p>Introduction to Mycology</p> <p><i>Enabling objectives</i></p> <ul style="list-style-type: none"> <li>• Define the term Mycology</li> <li>• List the characteristics of fungi Topics to be lectured (2Hrs)</li> <li>• Definition of fungus</li> <li>• Superficial mycoses</li> <li>• Cutaneous mycoses</li> <li>• Subcutaneous mycoses</li> <li>• Systemic mycoses</li> <li>• Opportunistic mycoses</li> <li>• Laboratory Practice (6Hrs)</li> <li>• KOH examination(3Hrs)</li> <li>• Demonstration of fungus culture and drug sensitivity testing (3Hrs)</li> </ul>	
			3 <sup>rd</sup> examination	
Week 14-16	Nov_to_	6Hrs	<ul style="list-style-type: none"> <li>• Introduction to virology</li> <li>• general properties of virus</li> <li>• viral pathogens diagnosis and control of viral disease</li> </ul> <p>Specific Virology</p> <ul style="list-style-type: none"> <li>• RNA viruses(Influenza virus, parainfluenza virus, respiratory syncytial virus, measles virus, mumps virus, rubella virus, rabies virus)</li> </ul>	<p>Leslie Collier</p> <p>Huma Virology</p> <p>3<sup>rd</sup> edition</p> <p>Murray PR. et al., Medical Microbiology, 4<sup>th</sup> ed.</p>

			<ul style="list-style-type: none"> <li>• human T-cell lymphotropic virus, human immunodeficiency virus, hepatitis C virus)</li> <li>• DNA viruses(Herpesviruses (herpes simplex virus types 1 and 2, varicella-zoster virus, cytomegalovirus, Epstein-Barr virus, human herpesvirus 8), hepatitis B virus, smallpox virus)</li> </ul> <p>Reading assignment</p> <ul style="list-style-type: none"> <li>• <i>Hepatitis A virus, Hepatitis D , Hepatitis G virus ,polio virus</i></li> </ul>	
Week 17			<p>Final Examination (50%)</p> <p><u>Exam type</u></p> <p>Multiple choice question (20%) True/ false question (5%) Matching (5%)</p> <p>Short answer Question (10%) Essay question (10%)</p> <p>Bonus question(3%-composed</p>	

Week	Lecture Topics of Parasitology	Contact Hours	Reading Materials
1 <sup>st</sup> ~	<p>1. Chapter I- Introduction to Medical Parasitology</p> <ul style="list-style-type: none"> <li>• Features of parasites</li> <li>• Source of infection</li> <li>• Mode of transmission</li> <li>• Direct mode of transmission</li> </ul>	1	Judith S. Heelan, Frances W. Ingersoll. Essentials of Human Parasitology. 2002. Delmar Thomson Learning

	<ul style="list-style-type: none"> <li>• Indirect mode of transmission</li> <li>• Routes of transmission</li> <li>• General life cycle of parasites <ul style="list-style-type: none"> <li>• Direct life cycle</li> <li>• Indirect life cycle</li> </ul> </li> </ul>		Markell, Voge, Jhon. Medical Parasitology. 6th ed. 1986. W.b. Saunders company. David L. Belding. Text book of Parasitology. 3rd ed. 1965.
2 <sup>nd</sup> & 3 <sup>rd</sup>	Chapter II - Nematohelminthes /Round worms/ <ul style="list-style-type: none"> <li>○ General characteristics</li> <li>○ Classification (Intestinal &amp; tissue) <ul style="list-style-type: none"> <li>▪ Intestinal round worms <ul style="list-style-type: none"> <li>• <i>Ascaris lumbricoides</i></li> <li>• <i>Trichuris trichura</i></li> <li>• <i>Enterobiu svermicularis</i></li> <li>• <i>Ancylostoma duodenale</i></li> <li>• <i>Necator americanus</i></li> <li>• <i>Strongyloides stercoralis</i></li> </ul> </li> </ul> </li> </ul> Assignment I <ul style="list-style-type: none"> <li>▪ Tissue round worms <ul style="list-style-type: none"> <li>• <i>Wuchereriabancrofti</i></li> <li>• <i>Onchocerca volvulus</i></li> <li>• <i>Trichiniellaspiralis</i></li> </ul> </li> </ul>	2	Monica Cheesbrough. District Laboratory Practice in Tropical countries. Part I -2nded updated. 1998. Tropical Health Technology. Cambridge Judith S. Heelan, Frances W. Ingersoll. Essentials of Human Parasitology. 2002. Delmar Thomson Learning Mohammed AwolAdem and WaqtolaCheneke. Medical Parasitology: Lecture note for medical laboratory technology students: upgraded lecture note serious. 2006
4 <sup>th</sup> & 5 <sup>th</sup>	Chapter III –Plathyhelminthes Cestodes /The tape worms/ <ul style="list-style-type: none"> <li>○ General characteristics <ul style="list-style-type: none"> <li>▪ <i>Taeniasaginata</i></li> <li>▪ <i>Taeniasolium</i></li> <li>▪ <i>Hymenolepis nana</i></li> <li>▪ <i>Echinococcus granulosus</i></li> </ul> </li> </ul> Tematodes /The flukes/ <ul style="list-style-type: none"> <li>○ General characteristics</li> <li>○ Classification (blood, liver &amp; intestinal flukes) <ul style="list-style-type: none"> <li>▪ Blood flukes <ul style="list-style-type: none"> <li>• <i>Schistosoma mansoni</i></li> <li>• <i>Schistosoma haematobium</i></li> </ul> </li> </ul> </li> </ul> Mid Exam	2	Monica Cheesbrough. District Laboratory Practice in Tropical countries. Part I -2nded updated. 1998. Tropical Health Technology. Cambridge Judith S. Heelan, Frances W. Ingersoll. Essentials of Human Parasitology. 2002. Delmar Thomson Learning Mohammed AwolAdem and WaqtolaCheneke. Medical Parasitology: Lecture note for medical laboratory technology students: upgraded lecture note serious. 2006 Markell, Voge, Jhon. Medical Parasitology. 6th ed. 1986. W.b. Saunders company

			David L. Belding. Text book of Parasitology. 3rd ed. 1965
6 <sup>th</sup>	<p>Chapter IV – Introduction</p> <ul style="list-style-type: none"> <li>▪ Protozoa</li> <li>▪ General Morphology</li> <li>▪ Life Cycle</li> <li>▪ Classification</li> </ul>	1	<p>Monica Cheesbrough. District Laboratory Practice in Tropical countries. Part I -2nded updated. 1998. Tropical Health Technology. Cambridge</p> <p>Judith S. Heelan, Frances W. Ingersoll. Essentials of Human Parasitology. 2002. Delmar Thomson Learning</p> <p>Mohammed AwolAdem and WaqtolaCheneke. Medical Parasitology: Lecture note for medical laboratory technology students: upgraded lecture note serious. 2006</p> <p>Markell, Voge, Jhon. Medical Parasitology. 6th ed. 1986. W.b. Saunders company</p> <p>David L. Belding. Text book of Parasitology. 3rd ed. 1965</p>
7 <sup>th</sup>	<p>Chapter V - The Amoeba:</p> <p>Alimentary canal</p> <ul style="list-style-type: none"> <li>○ General <i>characteristics</i> <ul style="list-style-type: none"> <li>▪ <i>Entamoeba histolytica/dispar</i></li> </ul> </li> </ul> <p><i>Reading assignments</i></p> <ul style="list-style-type: none"> <li>- <i>Mechanism of action of anti-protozoan drugs</i></li> <li>- <i>Mechanism of action of anti-helminthic drugs</i></li> </ul>	1	<p>Monica Cheesbrough. District Laboratory Practice in Tropical countries. Part I -2nded updated. 1998. Tropical Health Technology. Cambridge</p> <p>Judith S. Heelan, Frances W. Ingersoll. Essentials of Human Parasitology. 2002. Delmar Thomson Learning</p> <p>Mohammed AwolAdem and WaqtolaCheneke. Medical Parasitology: Lecture note for medical laboratory technology students: upgraded lecture note serious. 2006</p> <p>Markell, Voge, Jhon. Medical Parasitology. 6th ed. 1986. W.b. Saunders company</p>

			David L. Belding. Text book of Parasitology. 3rd ed. 1965
8 <sup>th</sup> & 10 <sup>th</sup>	<p>Chapter VI - Flagellate Protozoa:</p> <p>Digestive and urogenital tract</p> <ul style="list-style-type: none"> <li>○ General <i>characteristics</i> <ul style="list-style-type: none"> <li>▪ <i>Giardia lamblia</i></li> <li>▪ <i>Trichomonasvaginalis</i></li> </ul> </li> </ul> <p>Hemoflagellates / Blood and Tissue/</p> <ul style="list-style-type: none"> <li>i. The Leishmania <ul style="list-style-type: none"> <li>a. <i>Leishmaniatropica complex</i></li> <li>b. <i>L. tropica minor</i></li> <li>c. <i>L. tropica major</i></li> <li>d. <i>L. aethiopica</i></li> </ul> </li> <li>ii. Leishmaniamexicana complex <ul style="list-style-type: none"> <li>a. <i>L. m. mexicana</i></li> <li>b. <i>L. m. Amazonensis</i></li> <li>c. <i>L. M. pifanoi</i></li> </ul> </li> <li>iii. Leishmanibraziliensis complex <ul style="list-style-type: none"> <li>a. <i>L. B. braziliensis</i></li> <li>b. <i>L. B. guyanensis</i></li> <li>c. <i>L. B. panamensis</i></li> <li>d. <i>L. peruviana</i></li> </ul> </li> <li>iv. Leishmaniadonovani complex <ul style="list-style-type: none"> <li>a. <i>L. d. donovani</i></li> <li>b. <i>L. d. chagasi</i></li> <li>c. <i>L. infantum</i></li> </ul> </li> <li>v. The Trypanosome <ul style="list-style-type: none"> <li>a. Trypanosoma brucei complex <ul style="list-style-type: none"> <li>i. <i>T. b. Gambiense</i></li> <li>ii. <i>T. b. Rhodesiense</i></li> </ul> </li> </ul> </li> </ul>	3	<p>Monica Cheesbrough. District Laboratory Practice in Tropical countries. Part I -2nd updated. 1998. Tropical Health Technology. Cambridge</p> <p>Judith S. Heelan, Frances W. Ingersoll. Essentials of Human Parasitology. 2002. Delmar Thomson Learning</p> <p>Mohammed AwolAdem and WaqtoLaCheneke. Medical Parasitology: Lecture note for medical laboratory technology students: upgraded lecture note serious. 2006</p> <p>Markell, Voge, Jhon. Medical Parasitology. 6th ed. 1986. W.b. Saunders company</p> <p>David L. Belding. Text book of Parasitology. 3rd ed. 1965</p>
11 <sup>th</sup> -15 <sup>th</sup>	<p>Chapter VII – Apicomplexa</p> <p>The Plasmodium Species</p> <ul style="list-style-type: none"> <li>● General characteristics <ul style="list-style-type: none"> <li>▪ <i>Plasmodium falciparum</i></li> </ul> </li> </ul>	4	<p>Monica Cheesbrough. District Laboratory Practice in Tropical countries. Part I -2nd updated. 1998. Tropical Health Technology. Cambridge</p> <p>Judith S. Heelan, Frances W. Ingersoll. Essentials of Human</p>



	<ul style="list-style-type: none"> <li>▪ <i>Plasmodium vivax</i></li> <li>▪ <i>Plasmodium malariae</i></li> <li>▪ <i>Plasmodium ovale</i></li> <li>• Drug resistance in malaria</li> </ul> <p>The Coccidia and related Protozoa</p> <ul style="list-style-type: none"> <li>• General characteristics <ul style="list-style-type: none"> <li>▪ Genus <i>Cryptosporidium</i></li> <li>▪ Genus <i>Isospora</i></li> <li>▪ Genus <i>Sarcocystis</i></li> <li>▪ Genus <i>Toxoplasma</i></li> <li>▪ Genus <i>Pneumocystis</i></li> </ul> </li> </ul>		<p>Parasitology. 2002. Delmar Thomson Learning</p> <p>Mohammed AwolAdem and WaqtolaCheneke. Medical Parasitology: Lecture note for medical laboratory technology students: upgraded lecture note serious. 2006</p> <p>Markell, Voge, Jhon. Medical Parasitology. 6th ed. 1986. W.b. Saunders company</p> <p>David L. Belding. Text book of Parasitology. 3rd ed. 1965</p>
16 <sup>th</sup>	Final Exam		

**Course title: Pathology**

**Course code: Path2054**

**Course ECTS: 5 (135 hrs)**

- Lecture: 48 hours
- Tutorial: 9 hours
- Home study: 60 hours
- Assignment and presentation: 18 hours

Contact hours/ week: 135-87= 48 hours/ 16 weeks= 3 hours

**Year/Semester Course is offered: Year II Semester I**

**Pre-requisite/co-requisite if any:** Physiology, and Biochemistry

**Course description:** This General Pathology course is designed to help B.Pharm students to better understand pharmacotherapy of both communicable and non communicable diseases which will prepare them to be competent providers of pharmaceutical service. Students will be able to explain the concepts of pathology and the pathophysiology of cellular injury, wound healing, hemodynamics of cardiovascular diseases, immunopathology, neoplasia, endocrine disorders, common infectious diseases and CNS disorders.

**Course objectives:**

- After completing this course, the student will be able to explain the pathophysiologic mechanisms of common disorders.

Week	Lecture #	Topic	References
1	1	Chapter 1: Pathophysiology basics (2 hrs)	1 – 8
		• Definition of pathology, the structure of cells and how cells reproduce, age, and die	
		• Homeostasis	
		• Diagnostic techniques in pathology	
		• Categories of the causes of diseases	
	• Causes, outcome, consequences of diseases		
	2	Chapter 2: Cellular Reaction to Injury (3 hrs)	1 – 8
		• Definition of hyperplasia, hypertrophy, atrophy, & Metaplasia	
• Reversible & irreversible forms of cell injury			

		<ul style="list-style-type: none"> <li>• Mechanisms of necrosis</li> </ul>	
2	3	<ul style="list-style-type: none"> <li>• Types of necrosis and their causes</li> </ul>	1 – 8
		<b>Chapter 3: Inflammation (4 hrs)</b>	
	<ul style="list-style-type: none"> <li>• Causes and processes of inflammation</li> </ul>		
	4	<ul style="list-style-type: none"> <li>• Etiopathogeneses of granulomatous inflammations</li> </ul>	
3	5	<ul style="list-style-type: none"> <li>• Acute and chronic inflammations</li> </ul>	1 – 8
		<b>Chapter 4: Healing (3 hrs)</b>	
		<ul style="list-style-type: none"> <li>• Processes and patterns of healing</li> <li>• Factors that influence wound healing</li> </ul>	
	6	<ul style="list-style-type: none"> <li>• Complications of wound healing</li> <li>• Fracture healing</li> </ul>	
4	7	<ul style="list-style-type: none"> <li>• Fluid balance</li> <li>• Cause and pathogenesis of clinical conditions like ischemia, infarction, thrombosis, embolism, DIC</li> </ul>	1 – 8
	8	<ul style="list-style-type: none"> <li>• Pathogenesis of edema of congestive heart failure, nephrotic syndrome, cirrhosis</li> </ul>	
		<b>Chapter 6: Genetics Disease (4 hrs)</b>	
5	9	<ul style="list-style-type: none"> <li>• Types of shock and their pathogenesis, manifestations, and complications</li> </ul>	1 – 8
		<ul style="list-style-type: none"> <li>• Basis of genetic diseases</li> </ul>	
	10	<ul style="list-style-type: none"> <li>• Categories of genetic diseases</li> <li>• Types of chromosomal disorders</li> </ul>	
6	11	<ul style="list-style-type: none"> <li>• Multifactorial disorders</li> </ul>	
<b>MID EXAM</b>			
		<b>Chapter 7: Immunoajj (6 hrs)</b>	1 - 8
	12	<ul style="list-style-type: none"> <li>• Hypersensitivity reaction</li> </ul>	
7	13	<ul style="list-style-type: none"> <li>• Etiologic factors in autoimmune disease</li> </ul>	
	14	Immunodeficiency states	

		<b>Chapter 8: Selected Infectious Diseases (6 hrs)</b>	<b>1 – 8</b>
		Etiology, pathogenesis and clinical features of typhoid fever, leishmaniasis, schistosomiasis and malaria, osteomyelitis	
8	15	Etiology, pathogenesis and clinical features of pneumonia, tuberculosis and leprosy	
	16	Etiology, pathogenesis and clinical features of syphilis, bacterial meningitis and HIV/AIDS,	
<b>9</b>	17	<b>Chapter 9: Metabolic Diseases (4 hrs)</b>	<b>1 – 8</b>
		<ul style="list-style-type: none"> <li>• Thyroid diseases and adrenal disorders (definition, classification, diagnosis criteria, pathogenesis, clinical manifestation and complications)</li> </ul>	
	18	Diabetes mellitus (definition, classification, diagnosis criteria, pathogenesis, clinical manifestation and complications)	
<b>10</b>	<b>19</b>	<b>Chapter 10: Neoplasm (7hrs)</b>	<b>1 – 8</b>
		<ul style="list-style-type: none"> <li>• Causes of abnormal cell growth</li> </ul>	
		<ul style="list-style-type: none"> <li>• Difference between neoplastic lesions and non-neoplastic ones</li> </ul>	
	20	<ul style="list-style-type: none"> <li>• Benign versus malignant tumours</li> </ul>	
		<ul style="list-style-type: none"> <li>• The warning signs of cancer</li> </ul>	
11	21	<ul style="list-style-type: none"> <li>• Methods and mechanisms of metastasis</li> <li>• Classifications of cancer</li> </ul>	
	22	<ul style="list-style-type: none"> <li>• Etiologic factors of carcinogenesis</li> <li>• Clinical effects of neoplasms</li> </ul>	
<b>12</b>	<b>23</b>	<b>Chapter 11: Diseases of CNS (4hrs)</b>	<b>1 – 8</b>
		<ul style="list-style-type: none"> <li>• Pathophysiology of degenerative disorders (Parkinsonism, Alzheimer, MS, ALS)</li> </ul>	
		<ul style="list-style-type: none"> <li>• Classification and pathogenesis of epilepsy</li> </ul>	

	24	<ul style="list-style-type: none"> <li>• Pathophysiology of psychiatric disorders (anxiety, depression, mania, OCD, schizophrenia)</li> </ul>	
		<ul style="list-style-type: none"> <li>• Acute alcohol intoxication and chronic alcoholism</li> </ul>	
<b>FINAL EXAM</b>			

**Delivery mode/methodology:**

•□Active learning methods (brain storming, discussion, etc), Lecture, group and individual presentation, assignment.

**Assessment mechanisms:** Continuous assessment & summative assessment

- Class attendance (%)
- Quiz (%)
- Assignments (%)
- Final Exam (40%)

**Learning Materials**

- Handouts
- Audiovisual aids: Computer & LCD
- Textbooks

**References:**

1. Cotran RS, Kumar V, Collins T. Robbins pathologic basis of diseases. Philadelphia, J.B. Saunders Company. Latest edition
2. Emanuel Rubin, and John L. Farber, Essential Pathology, Philadelphia, Latest edition
3. William Boyd; Textbook of Pathology, structure and Function in disease, Philadelphia, Latest edition
4. James E. Pointer; Alan B. Fletcher; Basic life support, California, Latest edition
5. F.B. Walter and M.S Israel; General Pathology, Churchill Livingstone Edinburgh and London, Latest edition
6. Macfarlane, Reid, callander, Illustrated Pathology, Churchill Livingstone, Latest edition
7. Muir’s Textbook of Pathology Latest edition
8. Lecture note on General Pathology for Health Science Students, 2004

**Course Title: Human Physiology II**

**Course Code:** Phyl2055

**Module name: Biomedical Module I**

**Module code:** Biom-M1033

**Course ECTS:** 5

- Lecture: 48 hours
- Tutorial:16 hours
- Presentations: 15 hours
- Assignment:7.5 hours
- Assessment (continuous and final) 8 hours
- Independent study (alone or in groups) 40.5 hours

**Mode of delivery:** Parallel

**Pre-requisite if any:** Human Physiology I

**Course description:**

This module will give an overview of a range of physiological systems, including the homeostasis, the cell and cell membrane transport, composition of the body Fluid, physiology of blood, physiology of the nerve, physiology of the muscle, autonomic NS, cardiovascular physiology, respiratory physiology, renal physiology, gastro intestinal system, energy metabolism, endocrine system, male and female reproductive system, central nervous system and the special senses.

**Course objectives:**

At the end of the module the student should be able to:

- Explain the composition of and levels of organization of human body.
- Describe the basic physiological principle of the “internal environment” of the body.
- Explain basic principles of homeostasis and homeostatic regulatory mechanisms.
- Describe functional importance of different organ systems of human body and their integrated role in the maintenance of homeostasis.
- Appreciate the various physiological regulatory mechanisms of the body in the maintenance of homeostasis.
- Describe the various structures of the GIT, Secretary functions of GIT, Digestive and Absorptive functions and Pathophysiology of the GIT.
- Explain about Energy and Metabolism, Body Temperature Regulation, Feeding regulation and its abnormalities.

- Describe in detail the various endocrine glands of the body and various hormones secreted, the pituitary gland function and malfunction, the thyroid gland function and malfunction, the adrenal gland hormonal abnormalities on the body functions, Calcium homeostasis and Glucose homeostasis.
- Describe the various structures of the male and female reproductive system, Pregnancy and contraception, Parturition and lactation.
- Explain the nervous mechanisms, which govern the regulation and homeostasis of the principal physiological systems.
- Describe in detail the general organization of the NS, Sensory and Motor functions of the NS, Higher motor centers - Functions and lesions.
- Describe the various special senses of the human body

### Course learning and teaching methods

- Active learning methods (brain storming, buzz group, discussion, etc), Lecture, group and individual presentation, assignment, project work, and laboratory work.

### Assessment techniques:

- Assignments and Seminars (20%)
- Quizzes (30%)
- Final-exam (50%)

### Teachers and Students Role

### References:

5. Guyton A. C 1995-2006. Textbook of Medical physiology. 9<sup>th</sup> -11<sup>th</sup> editions
6. Ganong WF 1993-2006. Review of Medical physiology, 18<sup>th</sup> -22<sup>nd</sup> editions
7. Tortora G. J 1993. Principles of Anatomy and physiology. 7<sup>th</sup> edition.
8. Salah Abu-Sitta. Handouts containing different chapters (eight separate handouts.)

**Course Schedule:** By contact time, contents/topics & reading/reference materials for each topic (physiology II)

Week	Contact hrs	Topic/sub-topic/chapter	Reading materials
1 <sup>St</sup>	3	<b><u>Physiology of Digestive System(8 Hrs)</u></b> - General overview of the GIT - Functional Structures of the GIT - Secretary function of GIT - Salivary Secretion	Guyton(p 791-799) Ganong(p 467-477)

		- Gastric secretion	
2 <sup>nd</sup>	3	- Pancreatic secretion - Intestinal secretion - Bile secretion, jaundice	Guyton(p 799-800) Ganong(p 479-508) Guyton(p 806)
3 <sup>rd</sup>	3	- Digestive & absorptive function of GIT - Pathophysiology of GIT <b><u>Energy and Metabolism(4 Hrs)</u></b> - Introduction to Energy and Metabolism - The metabolic rate	Guyton(p 800-817) Ganong(p 479-508) Guyton(p 819-824) Guyton(p 830-839) Ganong(p 279-285)
4 <sup>th</sup>	3	- Energy balance - Feeding and its regulation - Body temperature regulation - FEVER - Obesity and the balanced diet	Guyton(p 865-878) Ganong(p 279-285)
5 <sup>th</sup>	3	<b><u>Physiology of Endocrine Glands(12 Hrs)</u></b> - Introduction to Endocrine physiology - Mechanism of action of hormones - Hypothalamus-pituitary relationship	Guyton(p 905-916) Ganong(p 918-921)
6 <sup>th</sup>	3	- The pituitary gland function and malfunction - The thyroid gland function and malfunction	Guytonp 922-942) Ganong(p 317-328) Ganong(p 396-409)
7 <sup>th</sup>	3	- Adrenal medulla: catecholamine function and malfunction - Adrenal cortex: function and malfunction	Guyton(p 944-959) Ganong(p 356-380)
8 <sup>th</sup>	3	Calcium homeostasis - Bone formation and growth - Vitamin D <sub>3</sub> : synthesis, function and regulation - Parathyroid gland function and dysfunction Glucose homeostasis	Guyton(p 978-992) Ganong(p 382-395) Guyton(p 961-976) Ganong(p 333-353)



		<ul style="list-style-type: none"> <li>- Pancreas: endocrine and exocrine function of pancreas</li> <li>- Insulin: synthesis, function, mechanism of action</li> <li>- Glucagon, function, mechanism of action</li> </ul>	
9 <sup>th</sup>		<p><b><u>Reproductive System(8 Hrs)</u></b></p> <ul style="list-style-type: none"> <li>- Introduction to Male Reproductive system</li> <li>- Functional anatomy of male reproductive system</li> <li>- Primary &amp; secondary sexual characteristics</li> <li>- The male sexual act</li> <li>- Abnormalities of male sexual function</li> <li>- Functional anatomy of female reproductive system</li> <li>- Menstruation cycle</li> <li>- Female sexual act</li> <li>- Fertility &amp; birth control</li> <li>- Abnormalities &amp; secretion by ovaries</li> <li>- Fertilization</li> <li>- Implantation</li> <li>- Physiological changes during pregnancy</li> <li>- Parturition</li> <li>- Lactation</li> <li>- Fetal physiology</li> <li>- Physiological adjustments at birth</li> <li>- Nutrition of the neonate</li> <li>- Reproductive and hormonal function of the male testis</li> <li>- Spermatogenesis</li> </ul>	<p>Guyton(p 996-1001) Ganong(p 441-451)</p>

10 <sup>th</sup>	3	<ul style="list-style-type: none"> <li>- Function of seminal vesicles</li> <li>- Function of the prostate gland</li> <li>- The male sexual act</li> <li>- Androgens</li> <li>- Abnormalities of male sex</li> <li>- Reproductive function of female</li> </ul>	<p>Guyton(p 996-1011)</p> <p>Ganong(p 441-433)</p>
11 <sup>th</sup>	3	<ul style="list-style-type: none"> <li>- The menstrual cycle</li> <li>- Pregnancy and contraception</li> <li>- Parturition and lactation</li> </ul> <p><b><u>Physiology of Nervous System</u></b> <b><u>(Neurophysiology)(12 Hrs)</u></b></p> <ul style="list-style-type: none"> <li>- General overview and General organization of the NS</li> <li>- General tissue; neurons and neuralgia</li> </ul>	<p>Guyton(p 1011-1034)</p> <p>Ganong(p 433-451)</p> <p>Guyton(p 555-559)</p> <p>Ganong(p 129)</p>
12 <sup>th</sup>	3	<ul style="list-style-type: none"> <li>- Generation and transmission of nerve impulse</li> <li>- Neurotransmitters</li> <li>- Sensory function of the NS</li> <li>- Sensory receptors, classification</li> <li>- Somatic sensation and their pathways</li> </ul>	<p>Guyton(p 559-583)</p> <p>Ganong(p 138-148)</p>
13 <sup>th</sup>	3	<ul style="list-style-type: none"> <li>- Motor function of the NS</li> <li>- Reflexes; reflex arc, examples</li> <li>- Higher motor centers</li> <li>- Cerebral cortex</li> <li>- Basal ganglia function and disease</li> </ul>	<p>Guyton(p 673-684)</p> <p>Ganong(p 129-137)</p> <p>Guyton(p 685-697)</p>
14 <sup>th</sup>	3	<ul style="list-style-type: none"> <li>- Hypothalamus function and disease</li> <li>- Thalamus function and disease</li> <li>- Cerebellum function and disease</li> <li>- The brain stem; reticular formation</li> <li>- Pyramidal and extra pyramidal tracts, lesion</li> </ul>	<p>Guytonp 698-713)</p> <p>Ganong(p 202-217)</p>
15 <sup>th</sup>	3	<ul style="list-style-type: none"> <li>- Limbic system</li> <li>- Reticular activating system</li> </ul>	<p>Guyton(p 728-738)</p> <p>Ganong(p 192-196)</p>

		<ul style="list-style-type: none"> <li>- Brain electrical activity: EEG and sleep</li> <li>- Cerebral cortex, memory, speech, and aphasia</li> </ul> <p><b><u>Physiology of the Special senses (4 Hrs)</u></b></p> <ul style="list-style-type: none"> <li>- Introduction to Physiology of the Special senses</li> <li>- Visual sensation</li> </ul>	<p>Guyton(p 613-649)</p> <p>Ganong(p 148-168)</p>
16 <sup>th</sup>	3	<ul style="list-style-type: none"> <li>- Auditory sensation</li> <li>- Olfactory sensation</li> <li>- Gustatory sensation</li>   <li>- Physiology of equilibrium</li> </ul>	<p>Guyton(p 651-668)</p> <p>Ganong(p 171-188)</p>

## **Module 06: Biostatistics and Epidemiology**

**Module name:** Biostatistics and Epidemiology module

**Module category:** Basic

**Module code:** Com-H2063

**Module Number:** 06

**Module weight in ECTS:** 6 ECTS

**Courses:**

<b>Course Name</b>	<b>Course Code</b>	<b>ECTS</b>
Biostatistics	Com-H2061	3
Epidemiology	Com-H2062	3

**Module description:** This module will introduce students the principles and concept of Biostatistics and epidemiology.

**Module competency:** Involve in research and public health promotion

**Mode of delivery:** Block

**Module objectives:** At the end of this module students will be able to:

- Analyze data using various statistical techniques and soft wares
- Understand the principles of Epidemiology and biostatistics

**Module learning teaching methods**

### **Learning activities and teaching methods**

#### **A. Learning Activities**

Students are expected to undertake among others the following major learning activities:

- Engage in learning by doing (independent study, group assignments, presentation, report writing, and etc...)
- Participation and note takings during class lectures and debates and discussions;
- Analysis, summarization and presentations of chapter/article, motions on selected issues;

#### **B. Teaching Methods**

- The course facilitator is expected to lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments,
- Arrange and facilitate seminar sessions by inviting professionals for public lectures or debates on subject related issues.

**Course title: Biostatistics**

**Course Code:** Com-H2061

**Module name: Biostatistics and Epidemiology module**

**Module code:** Com-H2063

**Course ECTS:** 3 ECTS (81 hrs)

- Lecture:- 32 hours
- Tutorial:- 12 hours
- Home study : 30 hours
- Assessment : 7 hours

**Year/Semester Course is offered: Year II Semester II**

**Contact hours/ week:**

**Pre-requisite:**

**Course Description:**

**Course Objectives:**

At the end of this course students should be able to:

- Describe the different types and methods of data collection and identify advantages and limitations of the different methods
- Outline the steps in designing a questionnaire and identify the different interviewing techniques
- Describe the different methods of data organization and summarization and identify the advantage and disadvantages of the different methods
- Describe the different measures of mortality and fertility
- Compute probability of an event and composite events
- Identify type of events
- Describe commonly used probability distributions of discrete and continuous random variables
- Identify the different sampling methods
- Identify the different estimation techniques in one and two samples situation
- Estimate sample size for cross-sectional study
- Do test of hypothesis on means and proportions in one and two sample situations

**Course mode of delivery:** Parallel

**Course learning and teaching methods**

**Assessment techniques:**

**Teachers and Students Role**

## References:

1. Daniel, W.W., 1991. Biostatistics: a foundation for analysis in health Sciences, 5<sup>th</sup> ed. John Willy & Sons, New York
2. Getu Degu and Fasil Tessema, 2003. Biostatistics for Health Science Students. Lecture Note Series. The Carter Center
3. Douglas G. Altman, 1991. Practical Statistics for Medical Research. Chapman & Hall
4. Bernard Rosner, 1995. Fundamentals of Biostatistics. 4<sup>th</sup> ed. Duxbury Press
5. Theodore Colton, 1974. Statistics in Medicine. Little, Brown and Company
6. Betty R. Kirkwood, 1988. Essentials of Medical Statistics. Blackwell Science Ltd
7. Richard D. Remington, M. Anthony Schork, 1985. Statistics with Applications to Biological and Health Sciences, 2<sup>nd</sup> ed. Prentice Hall, New Jersey, USA
8. Abramson J. H., 1990. Survey Methods in Community Medicine. Epidemiological Studies Programme Evaluation Clinical Trials. 4<sup>th</sup> ed. Churchill Livingstone.
9. William G. Cochran, 1977. Sampling Techniques. 3<sup>rd</sup> ed. John Willy & Sons Inc.
10. Lwanga, S.K. and Lemeshow, S., 1991. Sample size determination in health studies. A practical Manual. World Health Organization, Geneva

## Contents:

1. Introduction
2. Methods of data collection
  - 2.1. Data types and measurement scales
  - 2.2. Data collection methods
  - 2.3. Questionnaire design and interviewing techniques
3. Methods of data processing, organization, presentation and summarization
  - 3.1. Tables and diagrams
  - 3.2. Measures of central tendency
  - 3.3. Measures of variation
4. Demographic statistics
5. Introduction to probability
  - 5.1 Rules of probability and types of events
  - 5.2 Probability distributions : binomial and normal distributions
6. Introduction to Sampling
  - 6.1 Non-probability sampling techniques
  - 6.2 Probability sampling techniques

7. Estimation techniques – point and interval estimation on one and two sample situation of means and proportions and sample size estimation for cross sectional study
8. Test of hypothesis: Type I and Type II errors, Power of the test, Critical and P-value methods, test on means and proportions in one and two sample situation

## **Epidemiology course syllabus**

**Course title: Epidemiology**

**Course Code:** Com-H2062

**Module name: Biostatistics and Epidemiology module**

**Module code:** Com-H2063

**Course ECTS:** 3 ECTS (81 hrs)

- Lecture:- 32 hours
- Tutorial:- 12 hours
- Home study : 30 hours
- Assessment : 7 hours

**Year/Semester Course is offered: Year II Semester II**

**Contact hours/ week:**

**Pre-requisite:**

**Course Description:**

This course is designed to equip students with the basic concepts of epidemiology (definition of epidemiology), communicable disease epidemiology, measures of disease occurrence, establishment of disease causation, epidemiological study designs, outbreak investigation and management, screening in disease control and epidemiological surveillance.

**Course Objectives:**

At the end of the course the student will be able to:

- Understand the principles of Epidemiology
- Describe concepts of disease causation
- Calculate the measures of disease and death
- Understand types of study design
- Investigate and control outbreaks and epidemics
- Describe the purpose and types of surveillance
- Understand the factors that affect validity of studies

**Course mode of delivery: Block**

**Course learning and teaching methods**

Brain storming, buzz group, discussion, Lecture, group and individual presentation, assignment

**Assessment techniques:**

- Class participation, quizzes, assignment, [50%], and
- Final exam (50%)



## Teachers and Students Role

### References:

- Charles H. Hennekens, DrPH. Julie E. Buring, Sc D. *Epidemiology in medicine*. Lippincott Williams and Wilkins, USA.
- Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. *Epidemiology for health science students: Lecture Note Series*.
- Lilienfield, MA. Lilienfield ED. *Foundations of epidemiology*, 1980, Oxford University Press, New York.
- Zein Ahmed Zein and H. Kloos. *The Ecology of Health and Disease in Ethiopia*, 1993.

**Course Schedule:** By contact time, contents/topics and reading/reference materials for each topic

Week	Contact hrs/week	Topic/subtopic chapter	Reading materials
1	3	Introduction to Epidemiology <ul style="list-style-type: none"> <li>• Definition</li> <li>• History of Epidemiology</li> <li>• Use/applications of Epidemiology</li> <li>• Scope of epidemiology</li> <li>• Basic assumptions of epidemiology</li> <li>• Theories disease causation</li> <li>• Levels of disease occurrence</li> <li>• Branches of epidemiology</li> </ul>	Charles H. Hennekens, DrPH. Julie E. Buring, Sc D. <i>Epidemiology in medicine</i> . In: definition and background and design strategies in epidemiologic research. Lippincott Williams and Wilkins, USA. 1987;p(1-16)  Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. <i>Epidemiology for health science students: Lecture Note Series</i> . In: chapter 2 and 3. Ethiopia. 2003; p(10-28)
2	3	Natural history of disease and levels of prevention <ul style="list-style-type: none"> <li>• natural history of disease</li> </ul>	Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. <i>Epidemiology for health science students: Lecture Note Series</i> . In: chapter 4. Ethiopia. 2003; p(29-38)

		<ul style="list-style-type: none"> <li>• stages in the natural history disease</li> <li>• levels of disease prevention</li> <li>• applications to common diseases</li> </ul>	
3	3	<p>The infectious disease cycle</p> <ul style="list-style-type: none"> <li>• agent</li> <li>• reservoir</li> <li>• portal of exit</li> <li>• modes of transmission</li> <li>• portal of entry</li> <li>• host</li> <li>• spread of disease through person to person transmission</li> <li>• infection vs. disease</li> <li>• time course of an infectious disease</li> <li>• carries and their role in disease transmission</li> <li>• individual and herd immunity</li> </ul>	<p>Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. Epidemiology for health science students: Lecture Note Series. In: chapter 5. Ethiopia. 2003; p(39-48)</p>
4 and 5	6	<p>Basic measurement in epidemiology</p> <ul style="list-style-type: none"> <li>• Number , ratio, proportion , and rate</li> <li>• Measures of morbidity -incidence and prevalence</li> </ul>	<p>Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. Epidemiology for health science students: Lecture Note Series. In: chapter 7. Ethiopia. 2003; p(57-77)</p>

		<ul style="list-style-type: none"> <li>Measures of mortality <ul style="list-style-type: none"> <li>-crude vs. specific rates</li> <li>- Standardization of rates</li> </ul> </li> </ul>	
6	3	<p>Source of epidemiologic data</p> <ul style="list-style-type: none"> <li>Census</li> <li>Vital records</li> <li>Data from health institutions</li> <li>Data from morbidity surveys</li> <li>Other sources</li> </ul>	<p>Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. Epidemiology for health science students: Lecture Note Series. In: chapter 6. Ethiopia. 2003; p(49-56)</p>
7	3	<p>Public health surveillance</p> <ul style="list-style-type: none"> <li>Definition</li> <li>Purpose of surveillance</li> <li>Types of surveillance</li> <li>Activities in surveillance</li> <li>Modifiable diseases</li> </ul>	<p>Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. Epidemiology for health science students: Lecture Note Series. In: chapter 12. Ethiopia. 2003; p(153-169)</p>
8 and 9	6	<p>Descriptive study designs</p> <ul style="list-style-type: none"> <li>Purpose of descriptive studies</li> <li>Types of descriptive study designs</li> </ul>	<p>Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. Epidemiology for health science students: Lecture Note Series. In: chapter 8. Ethiopia. 2003; p(78-90)</p> <p>Charles H. Hennekens, DrPH. Julie E. Buring, Sc D. Epidemiology in medicine. In: types of epidemiologic studies: descriptive studies. Lippincott Williams and Wilkins, USA. 1987;p(101-132)</p>
10 and 11	6	<p>Analytical epidemiology</p> <ul style="list-style-type: none"> <li>Purpose of analytical epidemiology</li> </ul>	<p>Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. Epidemiology for health science students: Lecture Note Series. In: chapter 9. Ethiopia. 2003; p(91-106)</p>

		<ul style="list-style-type: none"> <li>• Observational analytic study designs vs. experimental analytical studies</li> <li>• Case control studies</li> <li>• Cohort studies</li> <li>• Cross sectional studies</li> <li>• Intervention studies</li> <li>• Types of intervention studies</li> <li>• Analysis and interpretation</li> </ul>	<p>Charles H. Hennekens, DrPH. Julie E. Buring, Sc D. Epidemiology in medicine. In: types of epidemiologic studies: case control, cohort and interventional studies. Lippincott Williams and Wilkins, USA. 1987;p(133- 215)</p>
12 and 13	6	Measures of strength of association	<p>Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. Epidemiology for health science students: Lecture Note Series. In: chapter 9. Ethiopia. 2003; p(107-118)</p> <p>Charles H. Hennekens, DrPH. Julie E. Buring, Sc D. Epidemiology in medicine. In: measures of disease frequency and association. Lippincott Williams and Wilkins, USA. 1987;p(54-100)</p>
14	3	<p>Analysis of cause effect relationship</p> <ul style="list-style-type: none"> <li>• Validity of studies</li> <li>• Role of chance</li> <li>• Role of bias</li> <li>• Role of confounding factors</li> <li>• Evaluation of overall evidence for a cause-effect relationship</li> </ul>	<p>Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. Epidemiology for health science students: Lecture Note Series. In: chapter 10. Ethiopia. 2003; p(119-133)</p> <p>Charles H. Hennekens, DrPH. Julie E. Buring, Sc D. Epidemiology in medicine. In: analysis of cause effect relationship. Lippincott Williams and Wilkins, USA. 1987;p(30-53)</p>

15	3	<p>Screening in disease control</p> <ul style="list-style-type: none"> <li>• Definition</li> <li>• Diseases appropriate for screening program</li> <li>• Criteria for establishing screening program</li> <li>• Validity and reliability of tests</li> <li>• Sensitivity and specificity</li> <li>• Predictive value of a test</li> </ul>	<p>Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. Epidemiology for health science students: Lecture Note Series. In: chapter 13. Ethiopia. 2003; p(170-179)</p> <p>Charles H. Hennekens, DrPH. Julie E. Buring, Sc D. Epidemiology in medicine. In: screening. Lippincott Williams and Wilkins, USA. 1987;p(327-350)</p>
16	3	<p>Investigation of an epidemic</p> <ul style="list-style-type: none"> <li>• Definition of terms (endemic, hypo-endemic, hyper-endemic, holo-endemic, cluster of cases, outbreak, epidemic, pandemic)</li> <li>• Types of epidemics</li> <li>• Steps in epidemic investigation</li> <li>• Prevention and control strategies of epidemics</li> </ul>	<p>Kifle Wolde Michael, Yigzaw Kebede, Kidist Lulu. Epidemiology for health science students: Lecture Note Series. In: chapter 11. Ethiopia. 2003; p(134-152)</p>

**Module Name:** Introductory Pharmacy Module

**Module Category:** Core

**Module Code:** Phar-M2071

**Module Number:** 07

**Module Weight:** 4 ECTS

**Courses:**

Course name	Course code	ECTS
Introduction to pharmacy	Phar2071	2
Pharmaceutical calculations	Phar2072	2

**Module description:**

The module covers evolution and scope of pharmacy; pharmaceutical terminologies; and pharmacist role in the health care delivery. The module also introduces students with some fundamentals of measurement and calculations, calculation of doses and formulas, dilution and concentration and isotonic, buffer and electrolyte solutions. The field study will also provide an opportunity to the student to have practical exposure to the various pharmacy settings.

**Module objective:**

The aim of the module is to introduce the students with the pharmacy profession and its evolutionary development in the context of both the local and the global sense and to familiarize students with basic calculations related with pharmacy practices.

**Module competencies:**

Upon a successful completion of this module, students will be able to calculate doses for different groups of patients, quantify the ingredients required in dosage forms preparation & dispensing, prepare different strength of solutions and interpret prescriptions.

**Mode of delivery (Parallel/Block):** Parallel

**Module teaching/learning method:**

- Active participation during class lectures and excursions
- Engage in learning by doing
- The course instructor is expected to introduce concepts and topics and give references, facilitate discussions, ask questions, correct assignments
- Arrange and facilitate excursions

**Module mode of assessment:**

- Quizzes
- Report writing
- Assignments
- Seminar presentation
- Final exam

**Course Name:** Introduction to pharmacy

**Course code:** Phar2071

**Module Name:** Introductory Pharmacy Module

**Module Code:** Phar-M2071

**Course ECTS:** 2 ECTS

**Year/Semester Course is offered:** Year II Semester I

**Course prerequisite/s:** None

**Course description:**

The theoretical aspect of the course covers overview about Ethiopia's health care system; history and evolving scope of pharmacy practice; education pathway in pharmacy; pharmaceutical terminologies; and practice areas in pharmacy. The field study provides an opportunity to the student to have practical exposure to the various pharmacy settings.

**Course objective:**

After completion of this course students will be able to:

- Describe the structure of the Ethiopian health care system
- Discuss the history of pharmacy
- Read and interpret commonly used pharmaceutical and medical terminologies
- Identify the different practice areas in the profession of pharmacy

**Course mode of delivery:** Parallel

**Course learning and teaching methods**

- Illustrated lecture
- Individual and group exercises and assignments presentation
- Visits to various pharmacy settings (15 hrs: 3 hrs x 5 weeks)
- Alumni pharmacists' experience sharing in a class

**Assessment techniques:**

- Tests: 15
- Quizzes: 10%
- Presentation: 10%
- Assignments: 10%
- Report writing: 15%
- Final exam: 40%

**Teachers' and students' role**

**Roles of Instructors**

The instructor will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and provide feedback to students' assignment submissions on time;
- Prepare his/her lessons and deliver lectures;

- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties;

### **Roles of Students**

Students are expected to:

- Have a minimum of 85% class attendance
- Read all reading assignments in advance
- Submit all group and/or individual assignments on due date
- Take all continuous assessments as scheduled.

### **References:**

#### **Required readings (Text)**

1. Remington's Pharmaceutical Science, 21<sup>st</sup> ed., Lippincott Williams & Wilkins, Pennsylvania, 2006.

#### **Recommended readings**

2. Stone, P. and Curtis, S. J., Pharmacy Practice, 2<sup>nd</sup> ed., Farrand Press, London, 1995.
3. Sonnedeker, G., Kremer and Urdag's History of Pharmacy, Lippincott, Philadelphia, 1976.
4. Winfield, A. J. and Richards, R. M. E. (eds.), Pharmaceutical Practice, 2nd ed., Churchill Livingstone, London, 1998.
5. Michael L. P., Pharmacy, An Introduction to the Profession, The American Pharmacists Association, Washington DC, 2003.
6. Whalley, B. J., Fletcher K.E., Weston S.E., Howard R.L. and Rawlinson C.F., Foundation in Pharmacy Practice, Pharmaceutical Press, London, 2008.
7. Sneader W. Drug discovery: a history. John Wiley & Sons; 2005 Jun 23.
8. International Pharmaceutical Federation – FIP. Transforming Our Workforce. The Hague, The Netherlands: International Pharmaceutical Federation, 2016
9. Gall, D., Bates, I. and Bruno, A., 2012. FIP Global Pharmacy Workforce Report 2012.
10. MoH. Ethiopian Health Sector Transformation Plan (2015-2020)
11. Gosselin MC, Robbins J, Cupolo J. Inside pharmacy: The anatomy of a profession. CRC Press; 1998 Oct 2.
12. Pfizer Inc. Full preparation: the Pfizer guide to careers in pharmacy. Pfizer Pharmaceuticals Group; 2001.
13. Kelly WN. Pharmacy: what it is and how it works. CRC press; 2011 Jul 26.
14. Ethiopian Pharmaceutical Association (EPA) 1974 – 2015. 40th Anniversary Special Publication

### **Course schedule\***

<b>Week</b>	<b>Contact Hours</b>	<b>Topic/sub-topic/chapter/Assessments/Assignments</b>
1	1	1. Introduction to the Ethiopian Healthcare System 1.1. Health status 1.2. Health policies, strategies



		<ul style="list-style-type: none"> <li>1.3. Organization and governance</li> <li>1.4. Financing</li> <li>1.5. Physical and Human resources</li> <li>1.6. Provision of services</li> <li>1.7. MoH, EFDA, EPHI, EPSA</li> </ul>
2	1	<ul style="list-style-type: none"> <li>2. The history of Pharmacy and its evolving scope of practice</li> <li>2.1. A Brief History of Pharmacy (pre-historic pharmacy, antiquity, the middle ages, renaissance, discoveries and background of modern pharmacy)</li> </ul>
3	1	<ul style="list-style-type: none"> <li>2.2. History of drugs and dosage forms</li> <li>2.3. Pharmacy in Ethiopia: development, types of pharmacy settings</li> </ul>
4	1	<ul style="list-style-type: none"> <li>3. Education pathways in pharmacy</li> <li>3.1. The Early Years</li> <li>3.2. The Five-Year Versus the Six-Year Pharmacy Entry-Level Degree</li> <li>3.3. Pharmacy education capacity and training institution distribution</li> </ul>
5	1	<ul style="list-style-type: none"> <li>3.4. Accreditation Standards</li> <li>3.5. Continuing Education Programs</li> <li>3.6. Advanced study opportunities</li> </ul>
6	1	<ul style="list-style-type: none"> <li>4. Commonly used pharmaceutical and medical terminologies</li> <li>4.1. Latin terms and abbreviations, types of dispensed pharmaceutical preparations</li> </ul>
7	1	<ul style="list-style-type: none"> <li>5. Practice Areas in Pharmacy</li> <li>5.1. Academic Pharmacist</li> <li>5.2. Community Pharmacist</li> </ul>
8	1	<ul style="list-style-type: none"> <li>5.3. Compounding Pharmacist</li> <li>5.4. Critical Care Pharmacist</li> </ul>
9	1	<ul style="list-style-type: none"> <li>5.5. Drug Information Specialist</li> <li>5.6. Home Care Pharmacist</li> </ul>
10	1	<ul style="list-style-type: none"> <li>5.7. Hospital Staff Pharmacist</li> <li>5.8. Long-term Care Pharmacist</li> <li>5.9. Managed Care Pharmacist</li> </ul>
11	1	<ul style="list-style-type: none"> <li>5.10. Military Pharmacist</li> <li>5.11. Nutrition Support Pharmacist</li> <li>5.12. Operating Room Pharmacist</li> <li>5.13. Infectious Disease Pharmacist</li> </ul>
12	1	<ul style="list-style-type: none"> <li>5.14. Pediatric Pharmacist</li> <li>5.15. Industry-Based Pharmacist</li> <li>5.16. Nuclear Pharmacist</li> <li>5.17. Oncology Pharmacist</li> </ul>
13	1	<ul style="list-style-type: none"> <li>6. Pharmacists in Non-traditional Settings</li> <li>6.1. Pharmacy Benefit Manager</li> </ul>
14	1	<ul style="list-style-type: none"> <li>6.2. Poison Control Pharmacist</li> <li>6.3. Primary Care Pharmacist</li> <li>6.4. Regulatory Pharmacist</li> <li>6.5. Veterinary Pharmacist</li> </ul>
16		<b>FINAL EXAM</b>

**Course Name:** Pharmaceutical Calculations

**Course code:** Phar2072  
**Module Name:** Introductory Pharmacy Module  
**Module Code:** 07  
**Course ECTS:** 2

**Totally required hours for the course: 54hrs**

**Lecture hours:** 13

**Study hours:** 20

**Group work:** 14

**Project work:** 0

**Presentation(s):** 0

**Tutorial:** 7

**Assessment:**

**Year/Semester Course is offered:** Year II Semester I

**Course prerequisite/s:** None

**Course Description:**

This course is designed to familiarize students with the basic calculations related with pharmacy practices. The course introduces students with some fundamentals of measurement and calculations, calculation of doses and formulas, dilution and concentration and isotonic, buffer and electrolyte solutions, percentage calculations, calculations involving parenteral admixtures and radiopharmaceuticals.

**Course Objectives:**

After completion of this course students will be able to:

- Understand the basic concepts about balance sensitivity, significant figures, accuracy and percentage of errors, measurement of volume and weight, aliquot method of weighing and measuring, density, specific gravity, specific volume which are important in pharmacy practices.
- Understand the basic calculations in percentage preparations, dosage conversions, formula reduction and enlargement
- Understand the basic calculations of dilution and concentration
- Understand the basic calculations in isotonic, buffer and electrolyte solutions
- Understand the basic calculations involving parenteral admixtures and radiopharmaceuticals

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

- Active participation during class lectures and excursions
- Engage in learning by doing
- The course instructor is expected to introduce concepts and topics and give references, facilitate discussions, ask questions, correct assignments
- Arrange and facilitate excursions

#### **Assessment techniques:**

- Assignments: 15%
- Tests:30%
- Quizzes: 15%
- Final exam: 40%

#### **Teachers' and students' role**

##### **Roles of Instructors**

##### **The instructor will be expected to:**

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments & exercises of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties

##### **Roles of Students**

##### **Students are expected to:**

- Engage in learning by doing (independent study, group works/exercises, etc.)
- Be active learners (participate effectively in group assignments, class activities/exercises, etc.);
- Attend classes regularly

#### **References:**

##### **Required readings (Text)**

1. Ansel, H. C. Pharmaceutical calculations, 13th ed., Lippincott Williams & Wilkins, 2010.

##### **Recommended readings**

2. Joel L. Zatz and M. G. Teixeira. Pharmaceutical calculations, 5<sup>th</sup> ed., John Wiley & Sons, Inc., New Jersey, 2017.

3. Mansoor A Kahn, and Indra K Reddy. Pharmaceutical and Clinical calculation 2<sup>nd</sup> edition. CRC Press, New York, 2000.

### Course Schedule

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments	Reading Materials
1	2	<ul style="list-style-type: none"> <li>• Some fundamentals of measurement and calculations               <ul style="list-style-type: none"> <li>○ Balance sensitivity, significant figures, accuracy and percentage of errors</li> <li>○ Measurement of volume and weight</li> <li>○ Aliquot method of weighing and measuring</li> <li>○ Density, specific gravity, specific volume</li> </ul> </li> </ul>	Ref. 1&2, instructor provided handouts
2	2	<ul style="list-style-type: none"> <li>• Percentage calculations               <ul style="list-style-type: none"> <li>○ Percentage, ratio and proportion</li> <li>○ Percentage preparations (percentage W/V, V/V, W/W)</li> <li>○ Conversions of concentration to mg/mL, Parts per million (ppm)</li> </ul> </li> </ul>	Ref. 1&2, instructor provided handouts
3	2	<ul style="list-style-type: none"> <li>• Group &amp; Individual exercises</li> <li>• Quiz</li> </ul>	Ref. 1, instructor provided worksheet
4	2	<ul style="list-style-type: none"> <li>• Calculation of doses and formulas               <ul style="list-style-type: none"> <li>○ Calibration of Droppers</li> <li>○ Calculations of doses (dose size, number of doses, amount dispensed, quantity of ingredient)</li> <li>○ Drug Dosage based on Age (pediatrics and geriatrics)</li> <li>○ Drug Dosage based on Body Weight</li> <li>○ Drug Dosage based on Body Surface Area</li> </ul> </li> </ul>	Ref. 1&2, instructor provided handouts

		<ul style="list-style-type: none"> <li>○ Enlarging and reducing formulas</li> </ul>	
5	2	<ul style="list-style-type: none"> <li>● Dilution and concentration <ul style="list-style-type: none"> <li>○ Strength and total quantity</li> <li>○ Dilution and Concentration of liquids</li> <li>○ Dilution and Concentration of solids</li> <li>○</li> </ul> </li> </ul>	Ref. 1&2, instructor provided handouts
6	2	<ul style="list-style-type: none"> <li>● Group &amp; Individual exercises</li> <li>● Quiz</li> </ul>	Ref. 1, instructor provided worksheet
7	2	<ul style="list-style-type: none"> <li>● Dilution and concentration (Continued...) <ul style="list-style-type: none"> <li>○ Triturations</li> <li>○ Alligation medial and Alligation Alternate</li> <li>○ Specific gravity of Mixture</li> </ul> </li> </ul>	Ref. 1&2, instructor provided handouts
8		<ul style="list-style-type: none"> <li>● Test</li> </ul>	
9	2	<ul style="list-style-type: none"> <li>● Isotonic, buffer and electrolyte solutions <ul style="list-style-type: none"> <li>○ Calculation for Isotonic Solution preparation</li> <li>○ Sodium Chloride equivalent of a substance</li> <li>○ Isotonicity, osmolarity, milliequivalents, milliosmoles</li> </ul> </li> </ul>	Ref. 1&2, instructor provided handouts
10	1	<ul style="list-style-type: none"> <li>● Isotonic, buffer and electrolyte solutions <ul style="list-style-type: none"> <li>○ Buffers and buffer solutions</li> <li>○ Buffer equation</li> <li>○ Isotonic buffer solutions</li> </ul> </li> </ul>	Ref. 1&2, instructor provided handouts
11	2	<ul style="list-style-type: none"> <li>● Some calculations involving parenteral admixtures <ul style="list-style-type: none"> <li>○ Dry powders for reconstitution, parenteral admixtures, additives, hyperalimentation solutions, rate of flow of IV fluids</li> </ul> </li> </ul>	Ref. 1&2, instructor provided handouts
12	1	<ul style="list-style-type: none"> <li>● Some calculations involving radiopharmaceuticals</li> </ul>	

		○ Radioisotopes, radioactivity, units of radioactivity	Ref. 1&2, instructor provided handouts
13	2	• Some calculations involving Biological products (vaccines and immunizing agents)	Ref. 1&2, instructor provided handouts
14	2	• Group & Individual exercises • Quiz	Ref. 1, instructor provided worksheet
15		• Assignment and Exercises	Selected exercises from each chapter
16		<b>FINAL EXAM</b>	

## Pharmacognosy and Alternative Medicine I

**Module Name: Pharmacognosy and Alternative Medicine I**

**Module Category: Core**

**Module Code: Phar-M2081**

**Module Number: 08**

**Module Weight: 12 ECTS**

**Courses:**

Course name	Course code	ECTS
Chemistry of Natural Products	(Phar1081)	(5 ECTS)
Pharmacognosy	(Phar1082)	(7 ECTS)

**Module description:** The module studies about medicines derived from natural source; and natural substances and their chemistry. It is designed in such a way that the trainee gets well acquainted with the study of the physical, chemical, biochemical and biological properties of drugs, drug substances, or potential drugs or drug substances of natural origin as well as the search for new drugs from natural sources, various alternative and complementary medicine practices including the Ethiopian traditional medicine. It also deals with chemical structure, chemical reactions and synthesis of natural products.

**Module objective:** At the end of this module students will understand and demonstrate the source, chemical & biological features of drugs and drug substances of natural origin & explain different forms of complementary & alternative medicines.

**Module competencies:**

- Define and describe natural sources of drugs and drug substances
- Explain the physical, chemical, biochemical and biological properties of drugs or drug substances of natural origin
- Associate pharmaceutical application of natural products and related services
- Devise research protocols on drug discovery from natural products
- Demonstrate procedures of obtaining drug/drug substance from natural sources
- Perform physical, chemical & biological characterization of natural products
- Describe & compare the role of various forms of complementary & alternative medicines in primary health care service
- Display & perform regulatory & quality control activities on natural products
- Display rational usage of natural products (as drugs, foods, alternative medicines)

- Comply laboratory safety precautions and standards
- Assist research activities related to drug discoveries from natural products
- Follow scientific protocols to perform and report experimental works
- Ready to provide service that ensure rational usage of natural products

**Mode of delivery (Parallel/Block):**

- Total study hour: 324 hours

**Module teaching/learning method:**

Learning Activities:

- Attend lectures and demonstrations, take notes, and ask questions
- Engage in learning by doing (independent study, group assignments, presentation, report writing, and etc.)
- Participation and discussions
- Practical laboratory works including sample preparation, extraction, interpretation and report writing.

Teaching Methods

- The course facilitator is expected to lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments, guide practical sessions, correct and give feedbacks of reports of practical sessions.
- Arrange and facilitate seminar sessions, discussions and give comments and feedbacks.
- Field visit and visiting traditional practitioners

**Module mode of assessment:**

- Seminars and assignments
- Quizzes
- Practical exam
- Laboratory report
- Laboratory written exam
- Final exam



**Course Name:** Chemistry of Natural Products

**Course code:** Phar2081

**Module Name:** Pharmacognosy and Alternative Medicine I

**Module Code:** Phar-M2081

**Course ECTS: 5 (135hr)**

**Totally required hours for the module:**

- Lecture: 40 hours
- Laboratory 8 h
- Tutorial: 8 hours
- Individual presentation, group discussions, audiovisuals, seminars, and assignments: 10 hours
- Assessment (continuous & final): 8 hours
- Independent study (alone or in groups): 61 hours

**Year/Semester Course is offered:** Year II Semester I

**Course prerequisite/s:** Organic Chemistry, Organic Chemistry Laboratory

**Course description:** The course covers some selected topics in natural products chemistry. The goal is to acquaint students to the basic evidences, which are results of observations carried out over generations that are in use to chemically characterize natural products of primary and secondary metabolism. It also realizes that the same reactions organic chemists know so well are apparently only mimics of what occurs naturally.

**Course objective:**

After completion of this course students will be able to:

- Students will be able to describe the chemical structure, chemical reactions, some chemical classes and related properties of natural products as well as their applicability.

**Course mode of delivery:** Parallel

**Course learning and teaching methods**

### Assessment techniques:

- Seminars and assignments..... 25%
- Quizzes..... 25%
- Final exam..... 50%

### Teachers' and students' role

#### Roles of Instructors

The instructor will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties and
- Arrange and follow up practical sessions

#### Roles of Students

Students are expected to:

- Engage in learning by doing (independent study, project work; group work, etc.)
- Be active learners (participate effectively in laboratory activities, in group assignments, make presentations, write reports, etc.);

### References:

#### Required readings (Text)

1. Sarker SD, Nahar L, *Chemistry for Pharmacy Students. General, Organic and Natural Product Chemistry. John Willey and Sons Ltd, UK, 2007*
2. Dewick PM. *Medicinal Natural Products: A biosynthetic Approach, 3rd edition. Jhon Wiley and Sons, LTD, England 2009.*
3. David R. Klein, *Organic Chemistry as a Second Language: First Semester Topics, Wiley; 5 edition (September 11, 2019)*

## Course schedule\*

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments	Reading Materials
1	4hrs	Stereochemistry <ul style="list-style-type: none"> <li>Isomerism, conformation and configuration, chirality, enantiomers, optical activity, diastereomers, racemic mixtures, meso-compounds</li> </ul>	Sarker SD, Nahar L, Chemistry for Pharmacy Students. G Argawell, Organic and Natural Product Chemistry
2, 3&4	9hrs	Carbohydrates <ul style="list-style-type: none"> <li>Introduction, classification, reactions and configuration of carbohydrates, cyclic structures of monosaccharides, conformation of monosaccharides, chemistry of disaccharides and polysaccharides</li> </ul>	Sarker SD, Nahar L, Chemistry for Pharmacy Students. G
5	4hrs	Lipids <ul style="list-style-type: none"> <li>Definition, occurrence and composition of fats, oils and waxes; Reactions of fats and oils; Determination of analytical values for fats and oils</li> </ul>	
6&7	6hrs	Amino acids and proteins <ul style="list-style-type: none"> <li>Structure, nomenclature, physical and chemical properties of amino acids, structure and nomenclature of peptides, classification and properties of proteins, synthesis of peptides</li> </ul>	
8&9	5hrs	Terpenes <ul style="list-style-type: none"> <li>Introduction, properties and isolation of terpenoids, overviIsoprene rule, Classification of terpenoids, Significance of terpenoids in pharmacy</li> <li></li> </ul>	
10&11	4hrs (after terpenoids )	Steroids <ul style="list-style-type: none"> <li>Introduction, sources for steroids, significance of steroids in pharmacy, chemistry and nomenclature of steroids, sterols</li> <li>Basics of the biosynthetic concept of steroids must be included.</li> </ul>	
12	3hrs	Purines and nucleic acids <ul style="list-style-type: none"> <li>Introduction, Uric acid, Purine derivatives (adenine, xanthine, hypoxanthine, and guanine), Xanthine bases (theophylline, theobromine and caffeine), Introduction to and structure of nucleic acid</li> </ul>	
13&14		Heterocyclic compounds	

	(before terpene) 5hrs	<ul style="list-style-type: none"><li>• Introduction, classification and nomenclature, physical and chemical properties, significance of some heterocyclic compounds in pharmacy (furan, pyrrole, thiophene, pyrazole, imidazole, pyridine, pyrimidine, oxazole, isoxazole, and phenothiazine)</li></ul>	
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**Course Name:** Pharmacognosy

**Course code:** Phar 2082

**Module Name:** Pharmacognosy and Alternative Medicine I

**Module Code:** 08

**Course ECTS:** 7

**Totally required hours for the module:** 189 hours

**Assessment:**

- Seminar/Assignments/ quizzes: 35%
- Laboratory report writing and written exam: 15%
- Practical exam: 10%
- Final Exam: 40%

**Year/Semester Course is offered:** Year II Semester II

**Course prerequisite/s:** Chemistry of Natural Products

**Course description:** The course is designed in such a way that the trainee gets well acquainted with the study of the physical, chemical, biochemical and biological properties of drugs, drug substances, or potential drugs or drug substances of natural origin as well as the search for new drugs from natural sources. The course familiarizes trainees with the basic scientific knowledge and skill needed to obtain and characterize active substances from natural sources. It also helps trainees to understand and realize the fact that nature provides the origin and continuous supply of drugs or drug substances, and think about the proper management and utilization of such natural products.

**Course objective:**

After completion of this course students will be able to:

- To familiarize themselves to general aspects of crude drugs, extraction and isolation methods and the distribution, properties and uses of various primary and secondary metabolites of plant, animal and mineral origin.

**Course mode of delivery:** Parallel

## **Course learning and teaching methods**

- Illustrated Lecture: 48 hours
- Practical sessions: 48 hours
- Tutorial: 12 hours
- Seminars, assignments and presentation: 16 hours
- Assessment (continuous & final): 10 hours
- Independent study (alone or in groups): 45 h hours
- Field visits (10 h)

## **Assessment techniques:**

- Seminar/Assignments: 10%
- Quizzes/Continuous assessment: 25%
- Laboratory written exam: 15%
- Practical exam: 10%
- Final Exam: 40%

## **Teachers' and students' role**

### **Roles of Instructors**

- The instructor will be expected to:
- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties and
- Arrange and follow up practical sessions
- Roles of Students

### **Students are expected to:**

- Engage in learning by doing (independent study, project work; group work, etc.)
- Be active learners (participate effectively in laboratory activities, in group assignments, make presentations, write reports, etc.);

## References:

### Required readings (Text)

- William C. Evans, George E. Trease, and Daphne Evans, Trease and Evans' Pharmacognosy (16<sup>th</sup> ed.), Elsevier (2009).

### Recommended readings

- Dewick PM. Medicinal Natural Products: A biosynthetic Approach, 3<sup>rd</sup> edition. Jhon Wiley and Sons, LTD, England 2009.
- Sarker D, Latif Z, Gray A. Methods in Biothechnology Natural Products Isolation, 2<sup>nd</sup> edition, Human Press, Totowa, New Jersey, 2006
- Pulok K. Mukherejee. Quality control of herbal drugs; an approach to evaluation of botanicals. Business Horizons pharmaceutical publishers 2002

### Course schedule\*

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments
1&2		<ol style="list-style-type: none"><li>1. General Introduction<ol style="list-style-type: none"><li>1.1. Definition, History and scope of Pharmacognosy (1 hr)</li><li>1.2. Crude drugs (6 h)<ol style="list-style-type: none"><li>1.2.1. Pharmaceutical botany</li><li>1.2.2. Definition and Nomenclature of crude drugs</li><li>1.2.3. Classification of crude drugs</li><li>1.2.4. Evaluation of crude drugs</li><li>1.2.5. Types of preparations from plants</li><li>1.2.6. Schemes for pharmacognostic studies of crude drugs.</li><li>1.2.7. Official and Unofficial drugs</li><li>1.2.8. Factors affecting crude drug quality</li></ol></li><li>1.3. Steps in the scientific analysis of drugs from natural resources<ol style="list-style-type: none"><li>1.3.1. Selection of plant material</li><li>1.3.2. Taxonomic identification of the plant</li><li>1.3.3. Literature survey on the identified plant</li><li>1.3.4. Design of appropriate extraction and separation methods</li><li>1.3.5. Checking extracts/ fractions for pharmacological activity</li><li>1.3.6. Identification of classes of compounds found in the plant (phytochemical screening)</li><li>1.3.7. Isolation of active compounds or fractions responsible for the pharmacological activity of the plant</li></ol></li></ol></li></ol>
3&4	8hrs	<ol style="list-style-type: none"><li>2. General methods in studying constituents of crude drugs</li></ol>

		<p>2.1. Extraction (<b>3 hrs</b>)</p> <p>2.1.1. Definition and the need for extraction</p> <p>2.1.2. Preparation of plant material for solvent extraction</p> <p>2.1.3. Choice of suitable solvents</p> <p>2.1.4. Methods of extraction</p> <p>2.2. Isolation and purification of active constituents (<b>5hrs</b>)</p> <p>2.2.1. Classical methods of separation</p> <p>2.2.2. Modern methods/chromatographic methods</p> <p>2.2.2.1.</p>
5,6,7,8, 9,10, 11&12	29 hrs	<p>3. Major plant constituents and their botanical sources</p> <p>3.1. Primary and secondary plant metabolites (<b>1 h</b>)</p> <p>3.2. Carbohydrates (<b>2 h</b>)</p> <p>3.2.1. Sugars and sugar containing drugs</p> <p>3.2.2. Compounds related to sugars</p> <p>3.2.3. Polysaccharides</p> <p>3.2.4. Gums and mucillages</p> <p>3.3. Glycosides (<b>6 h</b>)</p> <p>3.3.1. General properties of glycosides</p> <p>3.3.2. Classification of glycosides</p> <p>3.3.3. Classes of glycosides: Anthraquinones, Saponins, Cardiac glycosides, Simplephenolic glycosides, Flavonoid glycosides, Isothiocyanate glycosides, Cyanogenetic glycosides, Coumarin glycosides, lignans</p> <p>3.4. Tannins (<b>2 h</b>)</p> <p>3.4.1. General properties and Chemistry</p> <p>3.4.2. Classification: Hydrolysable, Nonhydrolysable (condensed), Pseudotannins</p> <p>3.4.3. Significance of tannins</p> <p>3.5. Lipids and waxes (<b>2 h</b>)</p> <p>3.5.1. Lipids: Physical and chemical properties, Extraction methods</p> <p>3.5.2. Official fixed oils/fats and their composition</p> <p>Arachis oil, castor oil, almond oil, sesame oil, theobroma oil, codeliver oil etc</p> <p>3.5.3. Waxes: Definition and general properties, Animal waxes, Vegetable waxes</p> <p>3.6. Volatile oils (<b>5 h</b>)</p> <p>3.6.1. Distribution and occurrence, Uses, Methods of preparation (Distillation, Expression, Extraction with solvent, enzymatic hydrolysis), Physical properties, Chemistry, Biosynthesis</p> <p>3.6.2. Constituents of volatile oils: Hydrocarbons, Alcohols, Aldehydes, Ketones, Esters, Phenols and phenolic ethers Oxides Peroxides Sulfur containing compounds Nitrogen containing compounds</p> <p>3.7. Resins and resin combinations (<b>3 h</b>)</p> <p>3.7.1. General properties and chemistry</p>



		<p>3.7.2. Examples of drugs containing resins: Rosin, Podophyllin, Jalap, Mastic, Cannabis (Preparation, Constituents, Factors affecting the narcotic activity, Legal aspects, Analysis), Oleoresins Oleo-gum resins, Balsams</p> <p>3.8. Alkaloids (8 h)</p> <p>3.8.1. Definition, Nomenclature, Occurrence, Physical and chemical properties, Detection, Extraction and isolation</p> <p>3.8.2. Classification</p> <p>3.8.3. Classes of alkaloids</p> <p>3.8.3.1. Ornithine derived alkaloids: Tropane alkaloids Solanaceae alkaloids, Coca alkaloids, Pyrolizidine alkaloids</p> <p>3.8.3.2. Lysine derived alkaloids: Lobelia alkaloids, Lupine alkaloids</p> <p>3.8.3.3. Nicotinic acid derived alkaloids: Ricinine, Areca alkaloids, Tobacco alkaloids</p> <p>3.8.3.4. Tyrosine derived alkaloids: (1) Simple phenylethylamines and tetrahydroisoquinolines: Mescaline, Ephedrine, Alkaloids of 'Khat'; (2) Colchicine; (3) Papaver alkaloids: Phenanthrene group, Benzyloquinoline group; (4) Emetine and related alkaloids; (5) Tubocurarine</p> <p>3.8.3.5. Tryptophan derived alkaloids: Simple indoles, Tricyclic alkaloids: Pegamum alkaloids, Physostigma alkaloids, Ergot alkaloids (Historical background, Life cycle of ergot, Commercial production, Chemistry and occurrence, Biosynthesis and use, LSD), Rauwolfia alkaloids, Strychnos alkaloids, Cinchona alkaloids, Perwinkle alkaloids</p> <p>3.8.3.6. Histidine derived alkaloids: Pilocarpine</p> <p>3.8.3.7. Polyacetate derived alkaloids: Hemlock alkaloids</p> <p>3.8.3.8. Psedoalkaloids: Steroidal alkaloids: Veratrum alkaloids, Solanum alkaloids, Holarrhena alkaloids, Buxus alkaloids, Purine alkaloids</p>
13&14	(4 h)	<p>4. Natural compounds and cancer</p> <ul style="list-style-type: none"> <li>• Anticancer drugs of natural origin</li> <li>• Natural compounds as carcinogens</li> </ul>

**Module Name: Dosage Form Sciences I****Module Category:** Core**Module Code:** Phar-M2091**Module Number:** 09**Module Weight:** 9 ECTS**Courses:**

S/N	Course name	Course code	ECTS
1	Integrated Physical Pharmacy and Pharmaceutics I	Phar2091	7
3	Practical Integrated Physical Pharmacy and Pharmaceutics I	Phar2092	2

**Module Description**

The module deals with the science and arts of converting drugs into medicines rendering students with practical insight into drug formulation principles at the very outset. It gives students the basic sciences in physical pharmacy that play a role during large scale production and extemporaneous compounding of liquid dosage forms (solutions, emulsions and suspensions). Moreover, this module will give students about critical issue to be considered in formulation development including micromeritics, rheology, drug release from dosage forms (diffusion and dissolution), issue of components incompatibilities, drug stability and methods to determine shelf life of different products.

**Module Objective**

This module aims at providing the student with a broad understanding of physicochemical principles that govern the behavior of drugs, excipients and dosage forms. It also enables the student to prepare extemporaneous preparations based on the basic science knowledge she/he to gain.

**Module Competency**

This module enables student develop the knowledge, skill and attitude required in preparing extemporaneous preparations and play a role in formulation development.

**Mode of deliver**

- Parallel

**Module teaching/learning methods****Learning activities**

Students are expected to undertake among others the following major learning activities:

- Engage in learning by doing (independent study, group assignments, presentation, report writing, and etc...)
- Participation and note takings during class lectures and debates and discussions;
- Analysis, summarization and presentations of chapter/article, scientific papers (and be able present or submit in a concise and shorten form)
- Search validated formula from standard books, journals, scientific papers; elaborate the purpose of each component of the formula; understanding the compounding procedure; prepare extemporaneous preparations and then write label to it

**Teaching Methods**

- The course facilitator is expected to lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments,
- Arrange and facilitate seminar sessions by inviting professionals from other units/departments in the department/school and other interested staffs as well.

**Module mode of Assessment:**

- Group assignments
- Presentations
- Laboratory reports
- Practical exam
- Tests/quizzes
- Final Exam

**Course Name:** Integrated Physical Pharmacy and Pharmaceutics I

**Course code:** Phar2091

**Module Name:** Dosage Form Sciences Module

**Module Code:** Phar-M2091

**Course ECTS:** 7

**Totally required hours for the course:** 189hrs

**Lecture hours:** 64

**Study hours:** 100

**Group work:** 0

**Project work:** 0

**Presentation(s):** 10

**Tutorial:** 15

**Year/Semester Course is offered:** Year II Semester II

**Course prerequisite/s:** Pharmaceutical Calculations

**Course Description:**

The design of the course is based on the integration of the study of physico-chemical principles of pharmacy with the formulation and preparation of pharmaceutical dosage forms. The integration is done within each main class of pharmaceutical dosage forms. The study of the physico-chemical principles of pharmacy serves as a prologue to the materials covered in each section. The main focus of this course is the application of the knowledge of the physico-chemical principles of pharmacy to the rational formulation, compounding, quality control, packaging and storage of pharmaceutical dosage forms.

**Course Objectives:**

After completion of this course students will be able to:

- Understand the different types of dosage forms and routes of administration
- Understand the types of intermolecular interaction forces, the phase rule and phase equilibria of one, two and three component systems
- Understand the concepts surface and interfacial tensions, adsorption at liquid and solid interfaces
- Define solubility, understand different solubility expressions, the basic concepts behind gas/liquid and liquid/liquid solutions and solubility of different types of solids in liquids
- Understand the distribution law, and its applications

- Understand different types of containers, packaging materials, storage conditions and labeling requirements of pharmaceutical dosage forms
- Understand the different types of solution dosage forms and develop skills to compound them
- Define and differentiate Newtonian and Non-newtonian systems, understand thixotropic property of fluids, understand the methods of determination of viscosity and its pharmaceutical applications
- Understand sedimentation in suspensions, interfacial property of suspended particles, the electric double layer and DLVO theory
- Differentiate between flocculated and deflocculated suspensions and understand rheologic property of suspensions, preparation methods, and labeling & storage conditions
- Understand types of emulsions and methods to identify emulsion type, theories of emulsification and physical instabilities in emulsions, preservation of emulsions & rheology of emulsions
- Understand methods of extemporaneous compounding of emulsions, labeling and storage conditions

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

- Active participation during class lectures and excursions
- Engage in learning by doing
- The course instructor is expected to introduce concepts and topics and give references, facilitate discussions, ask questions, correct assignments
- Arrange and facilitate excursions

**Assessment techniques:**

- Assignments: 15%
- Tests:30%
- Quizzes: 15%
- Final exam: 40%

**Teachers' and students' role**

**Roles of Instructors**

**The instructor will be expected to:**

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment on the assignments & exercises of students on time;

- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties

### **Roles of Students**

#### **Students are expected to:**

- Engage in learning by doing (independent study, group works/exercises, etc.)
- Be active learners (participate effectively in group assignments, class activities/exercises, etc.);
- Attend classes regularly

### **References:**

#### **Required readings (Text)**

1. P. J. Sinko, Martin's Physical Pharmacy and Pharmaceutical Sciences, 7th Edition, Lippincott Williams & Wilkins, Philadelphia, 2016.
2. M. E. Aulton, Pharmaceutics: the science of dosage form design, 7th ed., Churchill Livingstone, Edinburgh.

#### **Recommended readings**

3. M. J. Wilson, Pharmaceutical Compounding and Dispensing, 2nd Edition, Pharmaceutical press, 2010.
4. L. V. Allen, N. G Popovich, H. C Ansel, Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, 11th edition, Lippincott Williams & Wilkins, 2017.
5. J. E. Thompson and L. Davidow, A Practical Guide to Contemporary Pharmacy Practice, 3rd edition, Lippincott Williams & Wilkins.
6. A. Martin, J. Swarbrick and A. Cammarata, Physical Pharmacy, 3rd Edition, Lea & Febiger, Philadelphia, 1983.
7. A. T. Florence and D. Attwood, Physico-chemical Principles of Pharmacy, Macmillan Publishers Ltd., London, 1981
8. S. C. Wallwork and D. J. W. Grant, Physical Chemistry for Students of Pharmacy and Biology, 3rd Edition, Longman Group Ltd., London, 1977.

### **Course Schedule**

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments

1	4	<ul style="list-style-type: none"> <li>• Introduction to dosage forms and routes of drug administration <ul style="list-style-type: none"> <li>○ Definition, the need for dosage forms, classification, overview of dosage form design</li> <li>○ Introduction to pharmaceutical ingredients (definition, importance)</li> <li>○ Routes of administration</li> </ul> </li> </ul>
2	3	<ul style="list-style-type: none"> <li>• Phase Equilibria <ul style="list-style-type: none"> <li>○ Introduction to intermolecular force of interaction</li> <li>○ The phase rule</li> <li>○ Phase equilibria of single, two and three component systems (principles and applications)</li> </ul> </li> </ul>
3	4	<ul style="list-style-type: none"> <li>• Interfacial Phenomena <ul style="list-style-type: none"> <li>○ Liquid interface (surface/interfacial tension, measurement of surface/interfacial tension, surface free energy, spreading &amp; spreading coefficient)</li> </ul> </li> <li>• Quiz</li> </ul>
4	4	<ul style="list-style-type: none"> <li>• Interfacial Phenomena (Continued...) <ul style="list-style-type: none"> <li>○ Adsorption at liquid interfaces (surfactants: basic concepts, the HLB system and applications)</li> <li>○ Adsorption at solid interfaces (Solid/gas interface, solid/liquid interface, Adsorption isotherms)</li> </ul> </li> </ul>
5	4	<ul style="list-style-type: none"> <li>• Solubility and Distribution Phenomena <ul style="list-style-type: none"> <li>○ Terminologies (solute, solvent, solution, solubility)</li> <li>○ Solute-solvent interactions (polar, nonpolar and semi polar solvents)</li> <li>○ Solubility expressions</li> <li>○ Solubility of gases in liquids <ul style="list-style-type: none"> <li>▪ Factors affecting solubility of gases, Solubility calculations</li> </ul> </li> <li>○ Solubility of liquids in liquids</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>▪ Ideal and real solutions, complete and partial miscibility, factors affecting solubility of liquids</li> </ul>
6	4	<ul style="list-style-type: none"> <li>• Solubility and Distribution Phenomena (Continued...) <ul style="list-style-type: none"> <li>○ Solubility of solids in liquids <ul style="list-style-type: none"> <li>▪ Ideal and non-ideal solubility</li> <li>▪ Solubility and the heat of solution</li> <li>▪ Solubility of strong and slightly soluble electrolytes</li> <li>▪ Solubility of weak electrolytes (effect of pH)</li> <li>▪ The influence of solvents on the solubility of drugs</li> <li>▪ Influence of surfactants</li> <li>▪ Complexation as solubility enhancing mechanism</li> <li>▪ Influence of solid state (polymorphs, amorphous, solvates)</li> </ul> </li> <li>○ Distribution phenomena <ul style="list-style-type: none"> <li>▪ Distribution law</li> <li>▪ Effect of molecular association and ionic dissociation</li> <li>▪ Applications</li> </ul> </li> </ul> </li> </ul>
7		<ul style="list-style-type: none"> <li>• Test I</li> </ul>
7	4	<ul style="list-style-type: none"> <li>• Packaging and storage of pharmaceuticals <ul style="list-style-type: none"> <li>○ Introduction (definitions and terminologies)</li> <li>○ Packaging materials</li> <li>○ Closures</li> <li>○ Labeling pharmaceutical dosage forms</li> <li>○ Storage, stability of pharmaceuticals and beyond use date</li> </ul> </li> </ul>
8	1	<ul style="list-style-type: none"> <li>• Packaging and storage of pharmaceuticals (Continued...) <ul style="list-style-type: none"> <li>○ Labeling pharmaceutical dosage forms</li> <li>○ Storage, stability of pharmaceuticals and beyond use date</li> </ul> </li> <li>• Quiz</li> </ul>
9	4	<ul style="list-style-type: none"> <li>• Pharmaceutical Solutions <ul style="list-style-type: none"> <li>○ Introduction</li> </ul> </li> </ul>



		<ul style="list-style-type: none"> <li>○ Formulation of solutions (API and Excipients)</li> <li>○ General methods of preparation</li> <li>○ Solutions taken orally</li> </ul>
10	4	<ul style="list-style-type: none"> <li>● Pharmaceutical Solutions (Continued...) <ul style="list-style-type: none"> <li>○ Solutions used in the mouth and throat</li> <li>○ Solutions instilled into body cavities</li> <li>○ Topical solutions</li> <li>○ Injectables (sterile products)</li> </ul> </li> </ul>
11	4	<ul style="list-style-type: none"> <li>● Rheology <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Newtonian and Non-Newtonian systems</li> </ul> </li> </ul>
12	3	<ul style="list-style-type: none"> <li>● Rheology (Continued...) <ul style="list-style-type: none"> <li>○ Thixotropy</li> <li>○ Determination of viscosity</li> <li>○ Pharmaceutical applications of rheology</li> </ul> </li> </ul>
13		<ul style="list-style-type: none"> <li>● Test II</li> </ul>
13	4	<ul style="list-style-type: none"> <li>● Colloids <ul style="list-style-type: none"> <li>○ Introduction (definition, classification and applications)</li> <li>○ Optical properties of colloids</li> <li>○ Kinetic properties of colloids</li> <li>○ Electrical properties of colloids</li> </ul> </li> </ul>
14	3	<ul style="list-style-type: none"> <li>● Pharmaceutical Suspensions <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Desirable properties</li> <li>○ Sedimentation in suspensions</li> <li>○ Interfacial properties of suspended particles</li> <li>○ Electrical properties of suspended particles (EDL and DLVO theory)</li> </ul> </li> </ul>
15	4	<ul style="list-style-type: none"> <li>● Pharmaceutical Suspensions (Continued...)</li> </ul>

		<ul style="list-style-type: none"> <li>○ Flocculated/deflocculated suspensions (properties and evaluations)</li> <li>○ Formulation approaches (structure vehicle, controlled flocculation and combination)</li> <li>○ Rheology of suspension</li> <li>○ Preparation of suspensions (diffusible, indiffusible, poorly wettable solids)</li> <li>○ Label and storage</li> </ul>
16	4	<ul style="list-style-type: none"> <li>● Pharmaceutical Emulsions <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Determination of emulsion type</li> <li>○ Theories of emulsification (surface free energy, mechanisms of stabilization by emulsifying agents)</li> <li>○ Physical instabilities (creaming, flocculation, cracking, phase inversion)</li> <li>○ Preservation of emulsion</li> <li>○ Rheology of emulsion</li> <li>○ Preparation of emulsion</li> <li>○ Labelling and storage</li> </ul> </li> </ul>
		<b>FINAL EXAM</b>

**Course Name:** Practical Integrated Physical Pharmacy and Pharmaceutics I

**Course code:** Phar2092

**Module Name:** Dosage form Sciences Module

**Module Code:** Phar-M2091

**Course ECTS:** 2

**Totally required hours for the course:** 54hrs

**Illustrated lecture:** 8

**Practical lab:** 32

**Assignments and assessment:** 4

**Home Study:** 10

**Year/Semester Course is offered:** Year II Semester II

**Course prerequisite/s:** Pharmaceutical Calculations & Integrated Physical Pharmacy and Pharmaceutics I

### **Course Description:**

The course is designed to give basic understanding and concepts of practical Physical Pharmacy and Pharmaceutics. In this course students will be introduced to pharmaceutical measurements and the basic weight and volume measuring techniques. Furthermore, they will learn practically the effect of concentration and temperature on miscibility of partially miscible liquids, determination of equilateral diagram of determining three component systems, determination of the adsorption isotherms, the effect of temperature on solubility of slightly soluble drugs, techniques of determination of the solubility product, determination of dissociation constant, determination of distribution ratio, determination of the solubilizing action of Tweens, and formulation of liquid dosage forms.

### **Course Objectives:**

After completion of this course students will be able to:

- Describe Qualitative and Quantitative Accuracy
- Identify the different equipment used for measurement of weight and volume
- Describe the different cares that should be taken in weighing and volume measurement
- Identify the weight and volume measuring techniques
- Investigate the effect of concentration and temperature on miscibility of partially miscible liquids, and on solubility of drugs
- Describe three component systems
- Determine adsorption isotherms

- Understand the basic techniques of determination of the solubility product, dissociation constant, and distribution ratio
- To determine the solubilizing action of surface active agents
- Formulate different types liquid formulations

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

- Illustrated lectures and discussions, student presentations, individual and group laboratory practicals & demonstrations.

**Assessment techniques:**

- Practical skill and competency based exams: 50%
- Written exam: 25%
- Laboratory reports: 15%
- Presentation: 10%

**Teachers' and students' role**

**Roles of Instructors**

**The instructor will be expected to:**

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment lab reports, assignments & presentations of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist in laboratory practice & demonstrations,
- Assist students with learning difficulties

**Roles of Students**

**Students are expected to:**

- Engage in learning by doing (independent study, group works/exercises, etc.)
- Be active learners (participate effectively in group assignments, lab activities/presentations, etc.);
- Attend lab sessions regularly

**References:**

**Required readings (Text)**

1. Practical Manual

**Recommended readings**

2. P. J. Sinko, Martin's Physical Pharmacy and Pharmaceutical Sciences, 7th Edition, Lippincott Williams & Wilkins, Philadelphia, 2016.
3. M. E. Aulton, Pharmaceutics: the science of dosage form design, 7th ed., Churchill Livingstone, Edinburgh.

### Course Schedule

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments
1	3	<ul style="list-style-type: none"> <li>• Experiment No 1: Pharmaceutical Measurement and Interpretations of Prescriptions</li> </ul>
2	3	<ul style="list-style-type: none"> <li>• Experiment No 2: Formulation of liquid dosage forms</li> </ul>
3	3	<ul style="list-style-type: none"> <li>• Experiment No 3: Solubility of Partially Miscible Liquids</li> </ul>
4	3	<ul style="list-style-type: none"> <li>• Experiment No 4: Three Component System</li> </ul>
5	3	<ul style="list-style-type: none"> <li>• Experiment No 5: Adsorption Isotherm</li> </ul>
6	3	Experiment No 6: Influence of Temperature on Solubility of Drugs and solubility product
7	3	<ul style="list-style-type: none"> <li>• Experiment No 7: Determination of Dissociation Constant and Distribution</li> </ul>
8	3	<ul style="list-style-type: none"> <li>• Experiment No 8: Micellar solubilization</li> </ul>
9	3	<ul style="list-style-type: none"> <li>• Experiment No 9: Spirits, Tinctures and Mixtures</li> </ul>
10	3	<ul style="list-style-type: none"> <li>• Experiment No 10: Syrups, Elixirs and Linctuses</li> </ul>

11	3	<ul style="list-style-type: none"> <li>• Experiment No 11: Solutions Used in the Mouth</li> </ul>
12	3	<ul style="list-style-type: none"> <li>• Experiment No 12: Solution Instilled into Body Cavities and solution for External Use</li> </ul>
13	3	<ul style="list-style-type: none"> <li>• Experiment No 13: Formulation and Evaluation of Suspension</li> </ul>
14	3	<ul style="list-style-type: none"> <li>• Experiment No 14: Formulation and Evaluation Emulsions</li> </ul>
15	3	<ul style="list-style-type: none"> <li>• Experiment No 15: Determination of HLB value of a given surfactant</li> </ul>
16	3	<ul style="list-style-type: none"> <li>• Experiment No 16: Protective action of hydrophilic colloids</li> </ul>
17		<ul style="list-style-type: none"> <li>• Practical exam</li> </ul>
20		<b>FINAL WRITTEN EXAM</b>

## **Module 10: Pharmacology Module I**

**Module name: Pharmacology module I**

**Module category: Core**

**Module code: Phar-M2101**

**Module number: 10**

**Module weight in ECTS: 7**

**Courses:**

<b>Course name</b>	<b>Course Code</b>	<b>ECTS</b>
Pharmacology I	Phar 3101	7

### **Module description**

The pharmacology module will familiarizes the pharmacy students about the drugs, their pharmacokinetics, pharmacodynamic, clinical indication, contraindication, drug interaction and adverse effect of the therapeutically used drugs. In addition to that the module introduces the students about poisons, and management of poisoning agents. By incorporating what they learn in the theoretical aspect in to the laboratory attachment they will become well organized and well oriented professional.

**Module objective:** The objective of the module is to impart fundamental knowledge, skill on the pharmacokinetics, pharmacodynamic, therapeutic use and toxic effects drugs of both therapeutically benefit or toxic/poisoning agents.

**Module competency:**

- Apply the knowledge and skill of Pharmacology and toxicology in drug therapy decision

**Mode of delivery:** Parallel

- Total time: 189 hrs
- Lecture: 64 hrs
- Practical/lab session: 30 hrs
- Tutorial: 32 hrs
- Independent study hour: 40 hrs
- Seminar/Presentation: 16 hrs
- Assessment: 7 hrs

**Module learning teaching methods**

Active learning methods (brain storming, buzz group, discussion, etc), Lecture, group & individual presentation, assignment, project work, and laboratory work.

**Mode of Assessment:**

- Quizzes
- Mid exam
- Final Exam
- Practical exam
- Seminar
- Assignment



## **PHARMACOLOGY MODULE COURSES SYLLABI**

**Course title:** Pharmacology I

**Course code:** Phar 2101

**Module name:** Pharmacology module I

**Module code:** Phar-M2101

**Course ECTS:** 7 ECTS (189 hrs)

- Lecture: 64 hours
- Laboratory: 30 hours
- Tutorial: 32 hours
- Home study: 40 hours
- Assignment and presentation: 16 hours
- Assessment : 7 hours

**Year/Semester Course is offered:**

**Contact hours/ week:** 189- 40= 149 hours/ 19 weeks= 8 hours

**Pre-requisite:**

- Biochemistry I and II
- Physiology I and II
- Human Anatomy

**Course description:**

- This course is designed to enable graduate Pharmacists comprehensively provide the student with the fundamental concepts of Pharmacology and provides students with knowledge about drugs used for treatment, diagnosis and prevention of various diseases. The course starts with basic pharmacologic principles including pharmacokinetic (absorption, distribution metabolism and elimination) and pharmacodynamics (mechanisms of action, drug-receptor interactions, receptor-response coupling and effect of drugs ) and synaptic transmission .The course also describes the Pharmacology of autonomic nervous system, central nervous system, respiratory system and gastro intestinal system. Moreover, the course also covers autocooids and drugs affecting inflammation.

**Course Objectives:**

- At the end of this course, students will be able to describe drugs acting on the nervous system, respiratory system, gastrointestinal system and explain autocooids and drug therapy of inflammation.

## **Learning Objectives**

- Up on completion of this course, students will be able to
  - Understand the general principles of pharmacology.
  - Explain the pharmacokinetics of drugs affecting the nervous system, respiratory system, gastrointestinal system and autacoids.
  - Explain the pharmacological actions, mechanism of actions, and therapeutic uses and pharmacokinetics of drugs affecting the nervous system, respiratory system, gastrointestinal system and autacoids.
  - Explain side effects of drugs acting on autonomic nervous system, central nervous system, respiratory, GI, and drugs acting on inflammation.
  - Apply concept and principles of pharmacology to ensure and proper use of drugs.
  - To work in Pharmacology Laboratory and will be able to practice selected basic experimental demonstration

## **Course mode of delivery: Block/Parallel**

### **Course learning and teaching methods**

- Active learning methods (brain storming, buzz group, discussion, etc), Lecture, group and individual presentation, assignment, project work, and laboratory work.

### **Assessment techniques:**

Continuous assessment & summative assessment

- Quiz (10%)
- Assignments with Presentation (10%)
- Tests (15%)
- Laboratory (25 %)
- Final Exam (40%)

## **Teachers and Students Role**

### **Role of Instructor**

The instructor will be expected to:

- Facilitate students' individual and group activities
- Organize students' hospital visit, laboratory work, workshop practices (if any) and project work presentation(s) and discussion sessions
- Assess students' performances (written and oral presentations)
- Provide timely feedback orally and in writing
- Make follow-up on developments made

- Plan and implement students' consultation program

## Role of Students

Students are expected to:

- Attend sessions
- Carry out individual and group tasks
- Active participant
- Reflect on feedbacks and take actions
- Carry out reading assignment

## References:

Required reading (text)

- A. Katzung B.G.: Basic and Clinical Pharmacology: 14<sup>th</sup> or later editions.

## Recommended reading:

- B. Goodman and Gilman's: The Pharmacological Basis of Therapeutics; 13<sup>th</sup> or later editions.
- C. Rang H.P. and Dale M.M. : Pharmacology; 8<sup>th</sup> edition or later editions.
- D. Mycek M.J. Harvey R.A. Lipincott's Illustrated Reviews: Pharmacology; 8<sup>nd</sup> or later editions.
- E. Richard A. LEHNE. Pharmacology for Nursing care. 5<sup>th</sup> or later editions.

**Course Schedule:** contact time, contents/topics & reading/reference materials for each topic

Week	Contact Hours	Topic/sub-topic/chapter/Assessment/Assignments	Reading Materials
1	4	<p>1. <b>General pharmacology</b></p> <ul style="list-style-type: none"> <li>• Introduction: Definition, Scope and Branches of Pharmacology History of Pharmacology, Drug: Definition, Sources and Nomenclature</li> <li>• Pharmacokinetics: <ul style="list-style-type: none"> <li>➤ Passage of drugs across a bio – membrane (passive, specialized or carrier mediated transport mechanisms)</li> <li>➤ Routes of drug administration (<b>Individual Reading</b>)</li> </ul> </li> </ul>	A, B

		<ul style="list-style-type: none"> <li>➤ Drug absorption (factors modifying absorption, first – pass effects, bio availability, drug formulations, special drug delivery systems)</li> </ul>	
2	4	<ul style="list-style-type: none"> <li>➤ Drug distribution (volumes, plasma protein bindings, distribution spaces – fat, BBB, placenta)</li> <li>➤ Drug biotransformation (phase I &amp; II reactions, consequences of enzyme induction &amp; inhibition, formation of toxic metabolites, factors influencing metabolism)</li> <li>➤ Excretion of drugs (renal – filtration, passive reabsorption, active secretion; biliary excretion &amp; entero – hepatic – circulation; other routes of excretion)</li> <li>➤ Pharmacokinetic variables (Vd, half – life, clearance, steady state, maintenance dose, loading dose, dosing intervals)</li> </ul>	
3	4	<ul style="list-style-type: none"> <li>• Pharmacodynamics:</li> <li>➤ Introduction, Receptors and General Mechanisms of Drug Action</li> <li>➤ Drug Receptor Interaction: Drug Receptor Theories,</li> <li>➤ Dose-Response Relationships (concepts: affinity, intrinsic activity, agonist, partial agonist/antagonist, agonist – antagonist interactions)</li> <li>➤ Receptor – effector coupling (signaling mechanisms, second messengers)</li> <li>➤ <b>Quiz 1</b></li> </ul>	A, B
3	9	<ul style="list-style-type: none"> <li>• Practical Laboratory Sessions; e.g. <ul style="list-style-type: none"> <li>➤ Lab animal handling techniques and routes of administration.</li> <li>➤ Introduction to Lab instruments &amp; route of drug administration</li> <li>➤ Effect of route of administration on onset and duration of action of drugs</li> </ul> </li> </ul>	
4	4	<ul style="list-style-type: none"> <li>• Drug Interactions (Classification and Mechanisms)</li> <li>• Adverse Drug Reactions, Describing Drug Toxicity (Types)</li> <li>• Therapeutic Index (LD50 and LD50 determination)</li> <li>• Gene Therapy</li> <li>• Clinical Pharmacology (Clinical drug development, fundamental concepts, application)</li> <li>• Pharmacogenetics</li> </ul>	A, B, D

5	4	<b>2. Drug affecting the autonomic nervous system</b> <ul style="list-style-type: none"> <li>• Introduction to Autonomic Neurotransmission</li> <li>• Pharmacology of Autonomic Drugs <ul style="list-style-type: none"> <li>• Cholinoreceptor agonists and cholinesterase inhibiting drugs</li> <li>• Cholinoreceptor Blocking Drugs: Antimuscarinic Drugs</li> </ul> </li> </ul>	B
6	2	<ul style="list-style-type: none"> <li>• Nicotinic Pharmacology</li> <li>• Ganglionic Blocking Drugs, Neuromuscular Blocking Drugs</li> </ul>	B
6	2	<ul style="list-style-type: none"> <li>• Sympathomimetic Drugs: Direct Acting Sympathomimetics, Indirect Acting Sympathomimetics</li> </ul>	
7	4	<ul style="list-style-type: none"> <li>• Adrenergic Receptor Blocking Drugs: Adrenergic Receptor Antagonists, <math>\beta</math>-Adrenergic Receptor Antagonists, Combined, Adrenergic Receptor Blocking Agents</li> <li>• <b>TEST</b></li> </ul>	B
7	6	<ul style="list-style-type: none"> <li>• Practical Laboratory Sessions; e.g. <ul style="list-style-type: none"> <li>➤ Effect of pilocarpine and atropine one the eye</li> </ul> </li> </ul>	
8	4	<b>3. Drugs acting on the kidney</b> <ul style="list-style-type: none"> <li>• Introduction: Urine Formation, Renal Tubular Transport Processes, Principles of Diuretic Action (1hr)</li> <li>• Diuretics: Carbonic Anhydrase Inhibitors, Loop Diuretics, Thiazide Diuretics, Potassium Sparing Diuretics and Osmotic Diuretics <ul style="list-style-type: none"> <li>• Vasopressin and Other Agents Affecting Renal Conservation of Water</li> </ul> </li> </ul>	A, B
8	9	Practical Laboratory Session; e.g. <ul style="list-style-type: none"> <li>• Effect of diuretic drugs on urine volume</li> </ul>	
9	4	<b>4. Cardiovascular Drugs</b> <ul style="list-style-type: none"> <li>• Drugs used for the Treatment of Hypertension/ Antihypertensive Agents <ul style="list-style-type: none"> <li>• Drugs Used for the Treatment of Angina</li> </ul> </li> </ul>	A, B, D
9	4	<ul style="list-style-type: none"> <li>• Drugs Used for the Treatment of Heart Failure</li> <li>• Drugs for the Treatment of Cardiac Dysrhythmias</li> </ul>	A, B, D
10	4	<ul style="list-style-type: none"> <li>• Lipid Regulating Drugs</li> <li>• Drugs for Hypotensive States (IV fluids, correction of electrolyte and acid base balance)</li> </ul>	A, B, D

11	4	<p><b>5. Drugs acting on blood and blood forming organs</b></p> <ul style="list-style-type: none"> <li>• Hematopoiesis; Anemias and Anti-anemic Agents</li> <li>• Coagulants and Anticoagulants</li> <li>• Thrombolytics and Antiplatelets</li> </ul>	A, B, D
12	4	<p><b>6. Autacoids and drug therapy of inflammation</b></p> <ul style="list-style-type: none"> <li>• Histamine and Its Antagonists</li> <li>• 5-Hydroxytryptamine and Its Antagonists; Bradykinin and Its Antagonists</li> <li>• Lipid Derived Autocoids/Ecosanoids/ and Platelet Activating Factor/PAF/ , Nitric Oxide</li> </ul>	B, D
13	4	<ul style="list-style-type: none"> <li>• Analgesic and Antipyretics: Non-Steroidal</li> <li>• Anti-inflammatory Drugs, Treatment of Rheumatoid Arthritis and Gout</li> </ul>	B, D
13	9	<p><b>7. Drugs Acting on the Respiratory System</b></p> <ul style="list-style-type: none"> <li>• Drugs for the Treatment of Asthma (<b>Presentation</b>)</li> <li>• Antitussives Expectorants and Nasal Decongestants (<b>Presentation</b>)</li> </ul>	C
14	4	<p><b>8. Drugs Acting on the Gastrointestinal System</b></p> <ul style="list-style-type: none"> <li>• Drugs for the treatment of Peptic Ulcer Disease</li> </ul>	B
15	4	<ul style="list-style-type: none"> <li>• Drugs for the Treatment of Constipation: Laxatives and Cathartics; (<b>Presentation</b>)</li> <li>• Drugs for the Treatment of Diarrhea: Antidiarrheals (<b>Presentation</b>)</li> <li>• Emetics and Antiemetics, Digestants (<b>Presentation</b>)</li> </ul>	
15	9	<ul style="list-style-type: none"> <li>• Practical Laboratory Sessions; e.g. <ul style="list-style-type: none"> <li>➤ Antispasmodic effect of Atropine</li> <li>➤ Anti-diarrheal effect of Loperamide</li> </ul> </li> </ul>	
		<b>Final Exam</b>	

## **Module 11: Medicinal Chemistry Module I**

**Module Name: Medicinal Chemistry Module I**

**Module Category:** Core

**Module Code:** Phar-M2111

**Module Number:** 11

**Module weight in ECTS:** 7 ECTS

**Courses:**

**Medicinal Chemistry I (Phar2111) (7 ECTS)**

### **Module description**

Medicinal chemistry is a chemistry-based discipline involving aspects of biological, medical and pharmaceutical sciences. It is the application of chemistry in the context of human medicine. The general purpose of this Module is to train highly qualified pharmacists who are competent in the invention, discovery, design, identification and preparation of biologically active compounds, the study of their metabolism, the interpretation of their mode of action at the molecular level and the construction of structure-activity relationships. Besides, this module helps the student in their future career especially in pharmaceutical industry drug research and development sections, in research institutions and in universities. Students will gain an appreciation for the drug development process, together with brief introduction to the drug discovery and designing methods, and also deals with the chemistry of various classes of drugs that act on different systems and organs of human body, and reviews the general principles of drug action and the pharmacological activities of various classes of drugs. The major focus is on the molecular mechanisms of drug action, with a detailed discussion of one or more prototypes of each drug class, which includes drugs acting on; autonomic nervous system, central nervous system, Histamine and histamine antagonists, non-narcotic analgesics, drugs used in gout; Antidiabetics, cardiovascular drugs; vitamins; pesticides; diagnostic agents; expectorants and antitussives; non-steroidal and steroidal hormones, local and general anesthetics, chemotherapeutic and products of biotechnology

**Module objective:** Upon completion of the module; students have concept of drug at molecular level to which they understand the effect of structure on the pharmacokinetics and Pharmacodynamics. Students are able to apply the knowledge in drug design, discovery and development.

### **Module competencies:**

- Understand and demonstrate principles and practice of medicinal chemistry
- Discuss and Practice on different methods employed in drug design that helps to drug discovery and development
- Ability to follow and critically interpret the latest advances in the theory and practice of medicinal Chemistry
- Describe, identify and classify drugs based on their chemical structure, pharmacological action and site of drug action
- Relate the relevance of structure to pharmacological action
- Explain the principles of drug action and the role of bonding in drug-target interactions
- Discuss and Analyze the structural activities relationships of different compounds
- Develop skill to identify and synthesize biologically active compounds using standard methods of synthesis
- Identify and Practice on naming of pharmaceutical products

- Understand the basic biotransformation of organic compounds
- Suggest chemistry based application of biologically active compounds in advance; evaluate the probable side effect and adverse reactions
- Participate in problem solving drug development strategies
- Describe the physicochemical properties of biologically active compounds and currently available drugs
- Apply the knowledge and skill in drug therapy decision making process
- Transfer knowledge obtained from medicinal chemistry

**Mode of Delivery:** Parallel

**Mode of Assessment:**

Quizzes (10%)

Laboratory (20%)

Tests (20%)

Assignments (10%)

Final Exam (40%)

### **Learning activities and teaching methods**

Interactive lectures, case studies, computer assisted learning, formative problem-solving exercises, self-directed learning through virtual learning environment and technologies.

### **Teachers' and students' role**

#### **Teacher's role**

Course instructors are expected to:

- Organize group discussions
- Provide lecture and guide students
- Providing assignments and feedbacks for students (reading, working)
- Prepare lecture note, Assignment topics and title for group discussions
- Select seminar title and advice students in preparation and presentations
- Prepare assessing questions and examine students
- Prepare cases

#### **Student's role**

Students are expected to:

- Attend each lecture classes and Be an active participant in class discussion (ask questions and answering questions)
- Read text books, lecture handouts and reference books
- Prepare and present seminar papers
- Analyze and evaluate different literatures, reference books and journal articles
- Present case studies
- Take exams



## Medicinal Chemistry Module Syllabi

<b>Course Title</b>	<b>Medicinal Chemistry I</b>
<b>Course Code</b>	Phar2111
<b>Course EtCTS (Course hour)</b>	7 (189 hrs)
<b>Pre-requisite</b>	Organic Chemistry
<b>Co-requisite</b>	Pharmacology I
<b>Course Description</b>	Medicinal chemistry is the application of chemistry in the context of human medicine. In this course students will gain an appreciation for the drug development process, together with brief introduction to the drug discovery and designing methods, and also deals with the chemistry of various class of drugs that act on different systems and organs of human body, which includes drugs acting on Autonomic nervous system, Central nervous system, Respiratory system, Antioxidants and Autoxidation, Diagnostic agents, Antihistaminic agents, Non-narcotic analgesics and related drugs, expectorants, Pesticides and Antitussives, Gastrointestinal and related drugs.
<b>Course Objectives</b>	After completion of this course, students will be able to understand the drug discovery and designing methods, and also deals with the chemistry of various class of drugs that act on different systems and organs of human body
<b>Supporting objectives</b>	<ul style="list-style-type: none"> <li>• Describe the basic concepts in medicinal chemistry,</li> <li>• Describe the basic concepts of drug design (the drug discovery and development process), and the strategies to achieve it.</li> <li>• To describe the chemical basis of drug absorption, distribution, metabolism and Elimination,</li> <li>• To recognize the important functional groups that act as weak acids and bases and to recognize the molecular and environmental factors that influence their precise ionization profiles.</li> <li>• To explore the fundamentals of drug metabolism (both biotransformation and conjugation pathways) through an identification of drug mechanisms that include the activation of some pro-drugs.</li> <li>• To describe the chemical basis of drug-target interactions.</li> <li>• To explore the structure-activity concepts related to the presence of specific functional groups in agonist and antagonist drug structures.</li> <li>• To understand the links with specific therapeutic applications for agonists and antagonists acting at specific drug receptors</li> <li>• To develop the ability to recognize superior therapeutic drug mechanisms and properties of drugs</li> </ul>
<b>Course Content</b>	

<p><b>1. Introduction to Medicinal Chemistry</b></p> <ul style="list-style-type: none"> <li>○ Definition of medicinal chemistry</li> <li>○ Sources of drugs</li> <li>○ Drug targets and drug-target interactions</li> <li>○ Introduction to drug design and discovery <ul style="list-style-type: none"> <li>▪ The process of drug discovery</li> <li>▪ Analogue design <ul style="list-style-type: none"> <li>• General Process</li> <li>• Special Process</li> </ul> </li> <li>▪ Structure Activity Relationship (SAR)</li> <li>▪ Pro-drug design <ul style="list-style-type: none"> <li>• Carrier linked pro-drugs</li> <li>• Bio-precursor pro-drugs</li> </ul> </li> <li>▪ Introduction to CADD</li> <li>▪ QSAR in drug design <ul style="list-style-type: none"> <li>• The partition parameter</li> <li>• Electronic parameter</li> <li>• Steric parameter</li> <li>• Hansch analysis</li> </ul> </li> </ul> </li> <li>○ Stereochemistry and drug action</li> <li>○ Receptors and drug action</li> <li>○ Drug metabolism</li> </ul>	<p><b>12 hrs</b></p>
<p><b>2. Drugs Acting on Autonomic Nervous System</b></p> <ul style="list-style-type: none"> <li>○ Cholinergic drugs <ul style="list-style-type: none"> <li>▪ Cholinergic agonists</li> <li>▪ Cholinergic antagonists</li> <li>▪ ACEI and pesticides</li> </ul> </li> <li>○ Adrenergic drugs <ul style="list-style-type: none"> <li>▪ Adrenergic agonists</li> <li>▪ Adrenergic antagonists</li> </ul> </li> </ul>	<p><b>14 hrs</b></p>
<p><b>3. Drugs Acting on the Central Nervous System</b></p> <ul style="list-style-type: none"> <li>○ <b>Local and General Anesthetics Drugs</b></li> <li>○ <b>CNS Depressant Drugs</b> <ul style="list-style-type: none"> <li>▪ Sedatives and hypnotics (Major tranquilizers (neuroleptics))</li> <li>▪ Anticonvulsant drugs</li> <li>▪ Minor tranquilizers (anxiolytics)</li> <li>▪ Central skeletal muscle relaxants</li> </ul> </li> <li>○ <b>CNS Stimulant Drugs</b> <ul style="list-style-type: none"> <li>▪ Analeptics</li> <li>▪ Antidepressants</li> <li>▪ CNS adrenergic</li> </ul> </li> </ul>	<p><b>14 hrs</b></p>
<ul style="list-style-type: none"> <li>○ <b>Drugs Used for Neurodegenerative Diseases</b> <ul style="list-style-type: none"> <li>▪ Anti – Parkinsonian Drugs</li> <li>▪ Anti – Alzheimer Drugs</li> </ul> </li> </ul>	<p><b>4 hrs</b></p>
<ul style="list-style-type: none"> <li>○ <b>Narcotic analgesics &amp; antagonists</b></li> </ul>	<p><b>4 hrs</b></p>
<p><b>4. Non Narcotic Analgesics and Related Drugs</b></p> <ul style="list-style-type: none"> <li>○ Non-narcotic analgesics</li> <li>○ Drugs used in the treatment of gout</li> </ul>	<p><b>4 hrs</b></p>

<p><b>5. Histamine and Antihistaminic Drugs</b></p> <ul style="list-style-type: none"> <li>○ H<sub>1</sub> – receptor blockers</li> <li>○ Inhibitors of histamine release</li> </ul> <p><b>6. Drugs Acting on the Respiratory System</b></p> <ul style="list-style-type: none"> <li>○ Drugs for the Treatment of Asthma</li> <li>○ Antitussives and Expectorants</li> <li>○ Nasal Decongestants</li> </ul> <p><b>7. Gastrointestinal and Related Agents</b></p> <ul style="list-style-type: none"> <li>○ H<sub>2</sub> receptor antagonists and related compounds</li> <li>○ Proton pump antagonists</li> <li>○ Miscellaneous gastrointestinal agents</li> </ul> <p><b>8. Pesticides</b></p> <ul style="list-style-type: none"> <li>○ Classification</li> <li>○ Specific pesticides</li> </ul> <p><b>9. Antioxidants and Autoxidation</b></p> <p><b>10. Diagnostic Agents</b></p> <ul style="list-style-type: none"> <li>○ Radio-opaque agents</li> <li>○ Classification</li> </ul> <p>Water-soluble contrast media, Water-insoluble contrast media, Iodized oils, Diagnostic drugs for kidney function tests, Diagnostic drugs for liver function tests, Miscellaneous diagnostic drugs</p>	<p><b>2 hrs</b></p> <p><b>2 hrs</b></p> <p><b>4 hrs</b></p>
<b>Total</b>	<b>64 hrs</b>
<b>Mode of Delivery</b>	<ul style="list-style-type: none"> <li>▪ Lecture: 64hrs</li> <li>▪ Laboratory 30hrs</li> <li>▪ Tutorial: 36hrs</li> <li>▪ Independent study hour: 40hrs</li> <li>▪ Seminar, Assignment: 12hrs</li> <li>▪ Assessment: 7hrs`</li> </ul>
<b>Mode of Assessment</b>	<p>Quizzes (10%)  Laboratory (20%)  Tests (20%)  Assignments (10%)  Final Exam (40%)</p>

<b>Text Book</b>	<i>Lemke, T.L. and Williams, D.A., Roche, V.F., Zito, W.S. Foye's Principles of Medicinal Chemistry, 6th. ed. Lippincott Williams &amp; Wilkins, 2008.</i>
<b>Reference Books</b>	<ol style="list-style-type: none"> <li>1. <i>Wilson-Gisvold-Doerge; Text book of organic medicinal chemistry and pharmaceutical chemistry. 12<sup>th</sup> edn.; Lippincott (USA), 2011.</i></li> <li>2. <i>Gareth Thomas, Medicinal Chemistry An introduction, 2<sup>nd</sup> edition, 2007</i></li> <li>3. <i>Rama Rao Nadendla; Principles of Organic Medicinal Chemistry, 2005.</i></li> <li>4. <i>Burger's Medicinal Chemistry and Drug discovery, Sixth edition, Volume 1: Drug Discovery; 2003</i></li> <li>5. <i>Burger's Medicinal Chemistry and Drug discovery and drug development, Sixth edition, Volume 2: Drug Discovery; 2003</i></li> <li>6. <i>Burger's Medicinal Chemistry and Drug discovery, Sixth edition, Volume 6: Nervous System Agents; 2003</i></li> <li>7. <i>Donald J. Abraham (Ed.). Burgers's medicinal Chemistry and Drug Discovery, 2003, 6<sup>th</sup> edn., vol1-6, wiley-interscience (USA)</i></li> <li>8. <i>Thomas, L.Lemeke and David, A. Wiliams. Principle of Medicinal Chemistry, 2002, 5<sup>th</sup> edn. A Lea and Febiger book, Williams and Wilkins</i></li> </ol>

**Module Name: Dosage Form Sciences II****Module Category:** Core**Module Code:** Phar-M3121**Module Number:** 12**Module Weight:** 9 ECTS**Courses:**

S/N	Course name	Course code	ECTS
1	Integrated Physical Pharmacy and Pharmaceutics II	Phar3121	7
2	Practical Integrated Physical Pharmacy and Pharmaceutics II	Phar3122	2

**Module Description**

The module deals with the science and arts of converting drugs into medicines rendering students with practical insight into drug formulation principles at the very outset. It gives students the basic sciences in physical pharmacy that play a role during large scale production and extemporaneous compounding of semisolid dosage forms (ointment, cream, paste and jelly). Moreover, this module will give students about critical issue to be considered in formulation development including micromeritics, rheology, drug release from dosage forms (diffusion and dissolution), issue of components incompatibilities, drug stability and methods to determine shelf life of different products.

**Module Objective**

This module aims at providing the student with a broad understanding of physicochemical principles that govern the behavior of drugs, excipients and dosage forms. It also enables the student to prepare extemporaneous preparations based on the basic science knowledge she/he to gain.

**Module Competency**

This module enables student develop the knowledge, skill and attitude required in preparing extemporaneous preparations and play a role in formulation development.

**Mode of deliver**

- Parallel

**Module teaching/learning methods****Learning activities**

Students are expected to undertake among others the following major learning activities:

- Engage in learning by doing (independent study, group assignments, presentation, report writing, and etc...)
- Participation and note takings during class lectures and debates and discussions;
- Analysis, summarization and presentations of chapter/article, scientific papers (and be able present or submit in a concise and shorten form)
- Search validated formula from standard books, journals, scientific papers; elaborate the purpose of each component of the formula; understanding the compounding procedure; prepare extemporaneous preparations and then write label to it

**Teaching Methods**

- The course facilitator is expected to lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments,
- Arrange and facilitate seminar sessions by inviting professionals from other units/departments in the department/school and other interested staffs as well.

**Module mode of Assessment:**

- Group assignments
- Presentations
- Laboratory reports
- Practical exam
- Tests/quizzes
- Final Exam

**Course Name:** Integrated Physical Pharmacy and Pharmaceutics II

**Course code:** Phar3121

**Module Name:** Dosage Form Sciences Module

**Module Code:** 07

**Course ECTS:** 7

**Totally required hours for the course:** 189hrs

**Lecture hours:** 64

**Study hours:** 80

**Group work:** 0

**Project work:** 0

**Presentation(s):** 14

**Tutorial:** 15

**Assessment:** 16

**Year/Semester Course is offered:** Year III Semester I

**Course prerequisite/s:** Integrated Physical Pharmacy and Pharmaceutics I

**Course Description:**

The design of the course is based on the integration of the study of physico-chemical principles of pharmacy with the formulation, preparation and stabilization of semisolid and solid pharmaceutical dosage forms. In line with this, the course deals with scientific principles related to diffusion and dissolution theories associated with drug release kinetics from dosage forms. The module is also designed to enable students apply these theories and principles for the formulation and production of semisolid and solid dosage forms in the practical compounding sessions and thereafter during their professional career. The principles of drug degradation mechanisms, rate and kinetic theories of chemical reactions are also included for their application in the determination of product shelf-life and stability studies. The applications of pharmaceutics in cosmetics, overview of radiopharmaceuticals and veterinary dosage forms are also included.

**Course Objectives:**

After completion of this course students will be able to:

- Apply the physicochemical, electrical and thermodynamic properties of colloidal particles for the formulation of acceptable disperse systems
- Develop the knowledge and skills of formulation, compounding and dispensing of semisolid and solid dosage forms
- Select and characterize appropriate formulation excipients and packaging materials for pharmaceutical dosage forms and labeling thereof

- Describe the theories of diffusion and dissolution and apply for the determination of drug release kinetics from a dosage form
- Describe the different approaches of product stability studies and determine the shelf-life and expiry date of pharmaceutical products
- Identify the different types of formulation incompatibilities and their effect on the physicochemical and therapeutic performance of products
- Describe the different types of radiopharmaceuticals and their application, handling and storage precautions
- Apply the knowledge and skills of pharmaceuticals in cosmetics
- Identify the important considerations while dealing with veterinary dosage forms

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

- Active participation during class lectures and excursions
- Engage in learning by doing
- The course instructor is expected to introduce concepts and topics and give references, facilitate discussions, ask questions, correct assignments
- Arrange and facilitate excursions

**Assessment techniques:**

- Assignments: 15%
- Tests:30%
- Quizzes: 15%
- Final exam: 40%

**Teachers' and students' role**

**Roles of Instructors**

**The instructor will be expected to:**

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments & exercises of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties

**Roles of Students**

**Students are expected to:**



- Engage in learning by doing (independent study, group works/exercises, etc.)
- Be active learners (participate effectively in group assignments, class activities/exercises, etc.);
- Attend classes regularly

**References:**

**Required readings (Text)**

1. P. J. Sinko, Martin’s Physical Pharmacy and Pharmaceutical Sciences, 7th Edition, Lippincott Williams & Wilkins, Philadelphia, 2016.
2. M. E. Aulton, Pharmaceutics: the science of dosage form design, 7th ed., Churchill Livingstone, Edinburgh.

**Recommended readings**

3. M. J. Wilson, Pharmaceutical Compounding and Dispensing, 2nd Edition, Pharmaceutical press, 2010.
4. L. V. Allen, N. G Popovich, H. C Ansel, Ansel’s Pharmaceutical Dosage Forms and Drug Delivery Systems, 11th edition, Lippincott Williams & Wilkins, 2017.
5. J. E. Thompson and L. Davidow, A Practical Guide to Contemporary Pharmacy Practice, 3rd edition, Lippincott Williams & Wilkins.
6. A. Martin, J. Swarbrick and A. Cammarata, Physical Pharmacy, 3rd Edition, Lea & Febiger, Philadelphia, 1983.
7. A. T. Florence and D. Attwood, Physico-chemical Principles of Pharmacy, Macmillan Publishers Ltd., London, 1981
8. S. C. Wallwork and D. J. W. Grant, Physical Chemistry for Students of Pharmacy and Biology, 3rd Edition, Longman Group Ltd., London, 1977.
9. Hardee, G. E. and Baggot, J. D., Development and Formulation of Veterinary Dosage Forms, 2nd ed. Marcel Dekker, Inc. New York, 1998.
10. Breuer, M. M., Cosmetic Science, Academic Press, London, 1978.

**Course Schedule**

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments
1	4	<ul style="list-style-type: none"> <li>• Semisolid dosage forms               <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Classification of semisolids</li> <li>○ Desired properties of semisolids</li> <li>○ <b>Ointments and Pastes</b></li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>▪ Introduction (Definitions, Properties and applications)</li> <li>▪ Formulation (ideal properties of bases, types of bases)</li> </ul>
2	4	<ul style="list-style-type: none"> <li>• Semisolid dosage forms (Continued...) <ul style="list-style-type: none"> <li>○ <b>Ointments and Pastes</b> (Continued...) <ul style="list-style-type: none"> <li>▪ Preparation of ointment and pastes</li> <li>▪ Packaging, labeling and storage</li> </ul> </li> <li>○ <b>Creams</b> <ul style="list-style-type: none"> <li>▪ Introduction (Definition, types and properties of creams)</li> <li>▪ Formulation</li> <li>▪ Methods of preparation</li> <li>▪ Packaging, labeling and storage</li> </ul> </li> <li>○ <b>Gels</b> <ul style="list-style-type: none"> <li>▪ Introduction (Definition and applications)</li> <li>▪ Classification</li> <li>▪ Formulation (Gelling agents, factors affecting gelation)</li> <li>▪ Syneresis and swelling of gels</li> <li>▪ Preparation of gels</li> <li>▪ Packaging, labeling and storage</li> </ul> </li> </ul> </li> </ul>
3	4	<ul style="list-style-type: none"> <li>• Suppositories and Pessaries <ul style="list-style-type: none"> <li>○ Introduction (Definition and applications)</li> <li>○ Formulations (desirable properties of bases, classification of bases, other excipients)</li> </ul> </li> <li>• Quiz</li> </ul>
4	3	<ul style="list-style-type: none"> <li>• Suppositories and Pessaries (Continued...) <ul style="list-style-type: none"> <li>○ Preparation of suppositories <ul style="list-style-type: none"> <li>▪ Calibration of moulds, determination of displacement value</li> <li>▪ Methods of preparation: fusion and compression</li> </ul> </li> <li>○ Packaging, labeling and storage</li> </ul> </li> </ul>
5	4	<ul style="list-style-type: none"> <li>• Micromeritics <ul style="list-style-type: none"> <li>○ Particle size and size distribution</li> <li>○ Methods for determination of particle size and size distribution</li> <li>○ Particle shape and surface area</li> </ul> </li> </ul>
6		<ul style="list-style-type: none"> <li>• Test I</li> </ul>
6 [day other than	4	<ul style="list-style-type: none"> <li>• Micromeritics (Continued...) <ul style="list-style-type: none"> <li>○ Methods for determination of surface area</li> </ul> </li> </ul>

the test day]		<ul style="list-style-type: none"> <li>○ Derived properties of powders (densities, porosity, packing arrangement, flowability)</li> </ul>
7	4	<ul style="list-style-type: none"> <li>● Powders and Granules <ul style="list-style-type: none"> <li>○ Powders as a dosage forms</li> <li>○ Introduction (definition, classification and applications)</li> <li>○ Preparation (size reduction, mixing and packing)</li> <li>○ Challenges of powder dosage forms; eg, eutectic mixtures</li> <li>○ Granules as dosage forms</li> <li>○ Granulated preparations</li> <li>○ Effervescent granules and methods of preparations</li> </ul> </li> <li>● Quiz</li> </ul>
8	4	<ul style="list-style-type: none"> <li>● Diffusion and Dissolution <ul style="list-style-type: none"> <li>○ Introduction (osmosis, dialysis, diffusion)</li> <li>○ Fick's law of diffusion (steady state, diffusion through a membrane)</li> <li>○ Applications of diffusion</li> <li>○ Dissolution of particles (Noyes-whetney equation, factors affecting dissolution)</li> </ul> </li> </ul>
9	2	<ul style="list-style-type: none"> <li>● Diffusion and Dissolution (Continued...) <ul style="list-style-type: none"> <li>○ Intrinsic dissolution rate</li> <li>○ Sink conditions, Lag time and burst effects</li> <li>○ Hixon-crowel equation</li> </ul> </li> </ul>
10	2	<ul style="list-style-type: none"> <li>● Kinetics and Drug Stability <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Rates and orders of reactions</li> </ul> </li> </ul>
11	4	<ul style="list-style-type: none"> <li>● Kinetics and Drug Stability (Continued...) <ul style="list-style-type: none"> <li>○ Physical degradation</li> <li>○ Chemical degradation (mechanisms and stabilization approaches)</li> <li>○ Factors affecting stability of drugs</li> <li>○ Influence of temperature on reaction rates (Arrhenius equation)</li> <li>○ Stability study (real time and accelerated stability study)</li> <li>○ Prediction of shelf life</li> </ul> </li> </ul>
12		<ul style="list-style-type: none"> <li>● Test II</li> </ul>
12 [day other	4	<ul style="list-style-type: none"> <li>● Introduction to radiopharmaceuticals <ul style="list-style-type: none"> <li>○ Formulation aspects, stability and handling of radiopharmaceuticals</li> </ul> </li> </ul>

than the test day]		<ul style="list-style-type: none"> <li>• Incompatibilities in formulation</li> </ul>
13	4	<ul style="list-style-type: none"> <li>• Cosmetics <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Hair cosmetics</li> <li>○ Skin cosmetics</li> </ul> </li> </ul>
14	4	<ul style="list-style-type: none"> <li>• Cosmetics (Continued...) <ul style="list-style-type: none"> <li>○ Deodorants and antiperspirants</li> <li>○ Oral care products</li> <li>○ Nail products</li> <li>○ Eye cosmetics</li> <li>○ Lip products</li> </ul> </li> </ul>
15	4	<ul style="list-style-type: none"> <li>• Veterinary dosage forms</li> </ul>
16		<ul style="list-style-type: none"> <li>• Test III</li> </ul>
		<b>FINAL EXAM</b>

**Course Name:** Practical Integrated Physical Pharmacy and Pharmaceutics II

**Course code:** Phar3122

**Module Name:** Dosage form Sciences Module

**Module Code:** Phar-M3121

**Course ECTS:** 2

**Totally required hours for the course:** 54hrs

**Illustrated lecture:** 8

**Practical lab:** 32

**Assignments and assessment:** 7

**Home Study:** 7

**Year/Semester Course is offered:**

**Course prerequisite/s:** Integrated Physical Pharmacy and Pharmaceutics II

**Course Description:**

The course is designed to give basic understanding and concepts of practical Physical Pharmacy and Pharmaceutics, including: determination of particle size by different techniques, determination of some derived properties of powders and granules, preparation of different extemporaneous semisolid preparations, preparation of suppositories and pessaries, preparation of powder and granule dosage forms, and determination of order and rate constant.

**Course Objectives:**

After completion of this course students will be able to:

- Understand methods and techniques used in determination of particle size using microscopy and by sieving,
- Determination of some derived properties of powders and granules, including: flowability, density and porosity
- Prepare different types of semisolid dosage forms, including: ointments, pastes, creams, and gels.
- Prepare suppositories and pessaries
- Prepare Powder and Granule dosage forms
- Understand the techniques of how to determine the specific rate constants of drugs
- Understand the techniques of how to determine the order of reaction
- Appreciate techniques to detected changes in the physical, chemical, or therapeutic qualities due to incompatibilities.

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

- Illustrated lectures and discussions, student presentations, individual and group laboratory practicals & demonstrations.

**Assessment techniques:**

- Practical skill and competency based exams: 50%
- Written exam: 25%
- Laboratory reports: 15%
- Presentation: 10%

**Teachers’ and students’ role**

**Roles of Instructors**

**The instructor will be expected to:**

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment lab reports, assignments & presentations of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist in laboratory practice & demonstrations,
- Assist students with learning difficulties

**Roles of Students**

**Students are expected to:**

- Engage in learning by doing (independent study, group works/exercises, etc.)
- Be active learners (participate effectively in group assignments, lab activities/presentations, etc.);
- Attend lab sessions regularly

**References:**

**Required readings (Text)**

- 1.

**Recommended readings**

- 2.

**Course Schedule**

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments
1	3	<ul style="list-style-type: none"> <li>• Experiment No 1: Determination of Particle Size by Microscopy</li> </ul>

2	3	<ul style="list-style-type: none"> <li>Experiment No 2: Determination of Particle Size by Sieving</li> </ul>
3	3	<ul style="list-style-type: none"> <li>Experiment No 3: Ointment</li> </ul>
4	3	<ul style="list-style-type: none"> <li>Experiment No 4: Ointments (cont.)</li> </ul>
5	3	<ul style="list-style-type: none"> <li>Experiment No 5: Pastes</li> </ul>
6	3	<ul style="list-style-type: none"> <li>Experiment No 6: Jellies</li> </ul>
7	3	<ul style="list-style-type: none"> <li>Experiment No 7: Cream</li> </ul>
8	3	<ul style="list-style-type: none"> <li>Experiment No 8: Suppositories</li> </ul>
9	3	<ul style="list-style-type: none"> <li>Experiment No 9: Suppositories (Cont.)</li> </ul>
10	3	<ul style="list-style-type: none"> <li>Experiment No 10: Determination of Some Derived Properties of Powders and Granules</li> </ul>
11	3	<ul style="list-style-type: none"> <li>Experiment No 11: Powder dosage forms</li> </ul>
12	3	<ul style="list-style-type: none"> <li>Experiment No 12: Granule dosage forms</li> </ul>
13	3	<ul style="list-style-type: none"> <li>Experiment No 13: Effervescent granules</li> </ul>
14	3	<ul style="list-style-type: none"> <li>Experiment No 14: Kinetics: Rate Constant</li> </ul>
15	3	<ul style="list-style-type: none"> <li>Experiment No 15: Kinetics: Order of Reaction</li> </ul>
16	3	<ul style="list-style-type: none"> <li>Experiment No 16: Incompatibility</li> </ul>
		<ul style="list-style-type: none"> <li>Practical exam</li> </ul>
FINAL WRITTEN EXAM		

## Module 13: Pharmacology Module II

**Module name:** Pharmacology module II

**Module category:** Core

**Module code:** Phar-M3131

**Module number:** 13

**Module weight in ECTS:** 10

**Courses:**

Course name	Course Code	ECTS
Pharmacology II	Phar 3131	7
Clinical Toxicology	Phar 3132	3

### Module description

The pharmacology module will familiarizes the pharmacy students about the drugs, their pharmacokinetics, pharmacodynamic, clinical indication, contraindication, drug interaction and adverse effect of the therapeutically used drugs. In addition to that the module introduces the students about poisons, and management of poisoning agents. By incorporating what they learn in the theoretical aspect in to the laboratory attachment they will become well organized and well oriented professional.

**Module objective:** The objective of the module is to impart fundamental knowledge, skill on the pharmacokinetics, pharmacodynamic, therapeutic use and toxic effects drugs of both therapeutically benefit or toxic/poisoning agents.

### Module competency:

- Apply the knowledge and skill of Pharmacology and toxicology in drug therapy decision

### Mode of delivery: Parallel

- Total time: 270 hrs
  - Lecture: 96 hrs
  - Practical/lab session: 30 hrs
  - Tutorial: 48 hrs
  - Independent study hour: 60 hrs
  - Seminar/Presentation: 24 hrs
  - Assessment: 12 hrs

### Module learning teaching methods



Active learning methods (brain storming, buzz group, discussion, etc), Lecture, group & individual presentation, assignment, project work, and laboratory work.

**Mode of Assessment:**

Quizzes

Mid exam

Final Exam

Practical exam

Seminar

Assignment

**Course title: Pharmacology II**

**Course code:** Phar 3131

**Module name: Pharmacology module II**

**Module code: Phar-M3131**

**Course ECTS:** 7 ECTS (189 hrs)

- Lecture: 64 hours
- Laboratory: 30 hours
- Tutorial: 32 hours
- Home study: 40 hours
- Assignment and presentation: 16 hours
- Assessment : 7 hours

**Year/Semester Course is offered: Year III, Semester I**

**Contact hours/ week:** 189- 40= 149 hours/ 16 weeks= 9 hours

**Pre-requisite:**

- Pharmacology I

**Course description:**

This course is a continuation of Pharmacology I. It is designed to enable graduate Pharmacists describe drugs that are not addressed in Pharmacology I and are used for treatment, diagnosis and prevention of diseases. The course starts with renal and cardiovascular pharmacology and tries to cover diuretics and drugs used for the treatment of hypertension, angina, congestive heart failure, arrhythmia, and hyperlipidemia. Then it describes drugs affecting blood and blood forming organs, Chemotherapeutic drugs which will include antibacterial, antiseptics, antifungal drugs, antiviral, antiprotozoal, antiparasitic and anticancer agents. Moreover this course also describes drugs acting on the endocrine system and finally dermatological agents used for various skin disorders.

**Course Objectives:**

At the end of this course, students will be able to describe drugs acting on various organs and systems and drugs used for the treatment of Infectious Diseases and Neoplastic Diseases.

**Learning Objectives**

- Up on completion of this course, students will be able to
  - Explain the pharmacokinetics of drugs acting on the renal, cardiovascular, blood and blood forming organs, and chemotherapeutic drugs

- Explain the pharmacological actions, mechanism of actions, and therapeutic uses of drugs renal, cardiovascular, blood and blood forming organs, and chemotherapeutic drugs
- Describe side effects of drugs acting on renal, cardiovascular, blood and blood forming organs, and chemotherapeutic drugs.
- Apply concept and principles of pharmacology to ensure and proper use of drugs.
- To work in Pharmacology Laboratory and will be able to practice selected basic experimental demonstration

**Course mode of delivery: Block/Parallel**

**Course learning and teaching methods**

Active learning methods (brain storming, buzz group, discussion, etc), Lecture, group and individual presentation, assignment, project work, case studies and laboratory work.

**Assessment techniques:**

Continuous assessment & summative assessment

- Quiz (10%)
- Tests (15%)
- Assignments with Presentation (10 %)
- Laboratory (25 %)
- Final Exam (40%)

**Teachers and Students Role**

**Role of Instructor**

The instructor will be expected to:

- Facilitates students' individual and group activities
- Organize students' hospital visit, laboratory work, workshop practices (if any) and project work presentation(s) and discussion sessions
- Assess students' performances (written and oral presentations)
- Provide timely feedback orally and in writing
- Make follow-up on developments made
- Plan and implement students' consultation program

**Role of Students**

Students are expected to:

- Attend sessions
- Carry out individual and group tasks
- Active participant
- Reflect on feedbacks and take actions
- Carry out reading assignment

**References:**

Required reading (text)

A. Katzung B.G.: Basic and Clinical Pharmacology: 14<sup>th</sup> or later editions.

**Recommended reading:**

B. Goodman and Gilman's: The Pharmacological Basis of Therapeutics; 13<sup>th</sup> or later editions.

C. Rang H.P. and Dale M.M. : Pharmacology; 8<sup>th</sup> edition or later editions.

D. Mycek M.J. Harvey R.A. Lipincott's Illustrated Reviews: Pharmacology; 8<sup>th</sup> or later editions.

E. Richard A. LEHNE. Pharmacology for Nursing care. 5<sup>th</sup> or later editions.

**Course Schedule:** contact time, contents/topics & reading/reference materials for each topic

Week	Contact hrs	Topic/sub-topic/chapter	Reading materials
1	4	<b>1. Drugs acting on the central nervous system</b> <ul style="list-style-type: none"> <li>• Central Neurotransmitters, Classification of CNS Drugs</li> <li>• General Anesthetics</li> <li>• Local Anesthetics</li> </ul>	A, E
1	9	<ul style="list-style-type: none"> <li>• Practical Laboratory Sessions; e.g. <ul style="list-style-type: none"> <li>➤ Anesthetic potency of ether and halothane</li> <li>➤ Solubility of general anesthetics</li> </ul> </li> </ul>	
2	4	<ul style="list-style-type: none"> <li>• Sedatives and Hypnotics: Benzodiazepines, Non-Benzodiazepines, Barbiturates, Newer Sedative Hypnotics</li> </ul>	A, E

		<ul style="list-style-type: none"> <li>• Alcohols</li> <li>• Centrally Acting Muscle Relaxants</li> </ul>	
2	6	<ul style="list-style-type: none"> <li>• Practical Laboratory Sessions; e.g. <ul style="list-style-type: none"> <li>➤ The sedative-hypnotic effect of diazepam</li> <li>➤ Effect of diazepam in induced skeletal muscle relaxation in mice by using inclined plane</li> </ul> </li> </ul>	
3	4	<ul style="list-style-type: none"> <li>• Opioid Analgesics and Antagonists</li> <li>• Analeptics/ CNS Stimulants/ and Psychotomimetics</li> <li>• General Aspects of Psychopharmacology</li> </ul>	A, E
3	9	<ul style="list-style-type: none"> <li>• Practical Laboratory Sessions; e.g <ul style="list-style-type: none"> <li>➤ Analgesic effect of morphine in mice using tail immersion method;</li> <li>➤ The analgesic effect of morphine after a pain is induced by chemical stimuli</li> <li>➤ Chemical induced comparative analgesic effect opioid and non-opioid analgesics</li> </ul> </li> </ul>	
4	4	<ul style="list-style-type: none"> <li>• Antipsychotics</li> <li>• Antidepressants</li> </ul>	A, E
4	4	<ul style="list-style-type: none"> <li>• Drugs for the treatment of Anxiety and Mood Disorders</li> <li>• Drugs for the treatment of Neurodegenerative Disorders</li> </ul>	
4		<ul style="list-style-type: none"> <li>• Practical Laboratory Sessions; e.g <ul style="list-style-type: none"> <li>➤ Atropine like Anti-Parkinson's drug</li> </ul> </li> </ul>	
5	4	<ul style="list-style-type: none"> <li>• Antiepileptic Drugs</li> <li>• Social Pharmacology: Drug Dependence</li> </ul>	A, E
5	4	<p><b>2.Anti-infective drugs</b></p> <ul style="list-style-type: none"> <li>• Principles of Antimicrobial Therapy</li> </ul>	A, B

		<ul style="list-style-type: none"> <li>Antiseptics and Disinfectants (<b>Presentation</b>)</li> </ul>	
6	4	<ul style="list-style-type: none"> <li>Cell Wall Synthesis Inhibitors: <math>\beta</math>-lactam Antibiotics and Other Cell Wall Synthesis Inhibitors</li> </ul>	A, B
7	4	<ul style="list-style-type: none"> <li>Protein Synthesis Inhibitors: Aminoglycosides, Tetracyclines, Chloramphenico, Macrolides, Streptogramins, Oxazolidinone, Others</li> </ul>	A, D
8	4	<ul style="list-style-type: none"> <li>Antimetabolites: Sulfonamides, Trimetoprim, Trimetoprim-Sulfamethoxazole</li> <li>Flouroquinolones</li> </ul>	A, D
9	4	<ul style="list-style-type: none"> <li>Antimycobacterial Drugs: Drugs for the Treatment of Tuberculosis</li> <li>Antileprosy drugs</li> </ul>	A, B
10	4	<ul style="list-style-type: none"> <li>Anrifungal Drugs: <ul style="list-style-type: none"> <li>➤ Systemic Antifungal Agents; Amphotericin B, Flucytocine, The Azoles, Echinocandins, Allylamines</li> <li>➤ Topical Antifungal Agents; Nystatin, Topical Azoles, Topical Allylamines</li> <li>➤ Other antifungal drugs like Griseofulvin</li> </ul> </li> </ul>	A, D
11	4	<ul style="list-style-type: none"> <li>Antiviral Agents: <ul style="list-style-type: none"> <li>Introduction,</li> <li>Agents to Treat Herpes Simplex Virus (HSV) &amp; Varicella Zoster Virus (VZV) Infections,</li> <li>Agents to Treat Cytomegalovirus (CMV) Infections, Hepatitis Virus</li> </ul> </li> </ul>	A, C
12	4	<ul style="list-style-type: none"> <li>Drugs for Influenza Virus Infection ,</li> <li>Drugs for Respiratory Syncytial Virus Infection</li> </ul>	A, B, D

		<ul style="list-style-type: none"> <li>• Antiretroviral Drugs</li> </ul>	
12	4	<ul style="list-style-type: none"> <li>• Drugs Used for the Treatment of Parasitic Infections (<b>Presentation</b>)</li> <li>• Drugs Used for the Treatment of Malaria</li> <li>• Drugs Used for the Treatment of Amebiasis, Giardiasis, Trichomoniasis, Leishmaniasis, and Trypanosomiasis (<b>Presentation</b>)</li> <li>• Anthelmintics (<b>Presentation</b>)</li> </ul>	B, D
13	4	<b>3. Anti-cancer Drugs</b> (Alkylating agents, Antimetabolites, anticancer antibiotics, Plant derived anticancer drugs,...and others anticancer drugs)	A
13	4	<b>4. Immunomodulators</b>	B
14	4	<b>5. Vitamins, hormones &amp; hormone antagonists</b> <ul style="list-style-type: none"> <li>• Vitamins: Water Soluble Vitamins and Fat Soluble Vitamins</li> <li>• Introduction; Anterior Pituitary Hormones: Growth Hormone and Its Antagonists, Prolactin, Gonadotropins Thyroid and Antithyroid Drugs</li> </ul>	B
15	4	<ul style="list-style-type: none"> <li>• Pancreatic Hormones: Drugs for the Treatment of Diabetes Mellitus- Insulin and Oral Hypoglycemic Agents</li> <li>• Corticosteroids</li> <li>• Sex Hormones: Estrogens, Anti-Estrogens and Estrogen Receptor Modulators Progestins, Anti-Progestins and Progesterone Receptor Modulators <ul style="list-style-type: none"> <li>• Hormonal Contraceptives, Androgens and Anabolic Steroids</li> </ul> </li> </ul>	A, B

16	4	<b>6. Dermatological Pharmacology</b> <ul style="list-style-type: none"> <li>• Drug Used for the Treatment of Skin Problems: Pediculicides and Scabicides</li> <li>Sunscreens and Agents Affecting Pigmentation</li> <li>• Drugs for the Treatment of Acne</li> <li>• Drugs for the Treatment of Psoriasis</li> </ul>	C
		<b>FINAL EXAM</b>	



**Course title: Clinical toxicology**

**Course code: Phar 3132**

**Module name: Pharmacology module II**

**Module code: Phar-M3131**

- Lecture: 32 hours
- Tutorial: 16 hours
- Home study: 20 hours
- Presentation : 8
- Assessment : 5

**Year/Semester Course is offered: Year III Semester II**

**Contact hours/ week: 2**

**Pre-requisite:** Pharmacology I and II

Schedule of contact time, contents/topics & reading/reference materials for each topic

**Course Description:**

Clinical toxicology course comprehensively provides the student with the fundamental concepts of clinical toxicology and provides students with knowledge about the toxic effects of a number of important therapeutic drug classes as well as additional insight into a number of organ systems. Specifically, the course covers general principles of toxicology; routes and types of exposure to toxicants and experimental toxicity testing methods. The course also describes the strategies in the management of poisoned patients starting from clinical stabilization to giving specific antidote. Then the course covers industrial and environmental toxicology in reference to, heavy metals, pesticides, air pollutants, organic solvents and vapours.. Moreover, the course emphasis to general and specific measures to be taken during poisoning in the management of common poisons substances, drugs, household toxicants and others.

**Course Objectives:**

To provide students with a conceptual framework for understanding the broad spectrum of toxicology with more emphasis on clinical toxicology

**Learning objectives**

After completing the course, students will acquire sound knowledge on toxicology, which will enable them to:

- a. Describe general toxicology principles and clinical management practice

- b. Describe drug adverse effects/toxicities particularly their recognition, prevention and treatment
- c. Decide on treatment of poisoned patients, and apply them effectively and safely for the benefit of the patient
- d. Describe the toxic effects and management of industrial and environmental toxicants
- e. Share the responsibilities to solve the emerging social, economic and medical problems of related to different toxicants.

**Course mode of delivery: Parallel**

**Course learning and teaching methods**

Active learning methods (brain storming, discussion, etc), Lecture, group and individual presentation, assignment, Case Studies and Practical visit to Emergency care unit to see treatment of poisoned patients.

**Assessment techniques:**

Continuous assessment & summative assessment

- Quiz (10%)
- Tests (20 %)
- Assignments with Presentation (10 %)
- Presentations on practical visit (Case presentations) (10 %)
- Final Exam (40%)

**Teachers and Students Role**

**Role of Instructor**

The instructor will be expected to:

- Facilitate students' individual and group activities
- Organize students' hospital visit, laboratory work, workshop practices (if any) and project work presentation(s) and discussion sessions
- Assess students' performances (written and oral presentations)
- Provide timely feedback orally and in writing
- Make follow-up on developments made
- Plan and implement students' consultation program

**Role of Students**

Students are expected to:

- Attend sessions
- Carry out individual and group tasks
- Active participant
- Reflect on feedbacks and take actions
- Carry out reading assignment

## Reference Books

### Required Reading (Text)

A. Doull, J., Kalassen, C.D., and Amdur, M.D., (eds.) Casarett and Doull's Toxicology, the Basic sciences of poisons, 10th Ed, MCGraw Hill, 2010.

### Recommended Reading

B. Timbrell, J.A. Introduction to Toxicology, Taylor and Francis Ltd. 4<sup>th</sup> ed. 2009.

C. Peter Viccellio. Handbook of medical toxicology 2008)

D. Lester M. Haddad et al. Clinical management of poisoning and drug overdose (2008

**Course Schedule:** contact time, contents/topics & reading/reference materials for each topic

Week	Contact hrs	Topic/sub-topic/chapter/Assessment/Assignments	Reading materials
1	2	<b>1. Introduction and General Principles of toxicology</b> <ul style="list-style-type: none"> <li>➤ Definition, History and Branches of toxicology</li> <li>➤ Scope and Application</li> </ul>	A, B
2	2	<ul style="list-style-type: none"> <li>○ Dose Response Relationship and LD 50</li> <li>○ Evaluation of Drug Toxicity in lower animals &amp; in man</li> </ul>	A, B
3	2	❖ Categories of Toxicologic Tests (acute, sub-acute, sub-chronic and chronic Toxicity, toxicogenetics	A, B
4	2	<b>2. Management of the poisoned or overdosed patient</b> <ul style="list-style-type: none"> <li>➤ Common poisons and Epidemiology of Poisoning</li> <li>➤ General Principles in Management of Poisoned patients</li> </ul>	A, B, D
5	2	<ul style="list-style-type: none"> <li>○ Clinical Stabilization and Supportive Therapy ( Cardiovascular, Respiratory, Neuropsychatry)</li> <li>○ Physical Examination and Laboratory investigation of Poisoned patients</li> </ul>	A, B, D
6	2	<ul style="list-style-type: none"> <li>○ GI decontaminations (Gastric Lavage, Activated Charcoal, Emesis, Laxatives and others)</li> </ul>	A, B, D
		<ul style="list-style-type: none"> <li>○ Enhancement of elimination of toxicants (PH Alteration, Dialysis)</li> <li>○ Specific Antidote</li> </ul>	A, B, D

7	2	3. <b>Industrial and environmental toxicants</b> <ul style="list-style-type: none"> <li>○ Heavy Metal Poisoning (Chemicals involved, Mechanisms of Toxicity and Toxic Manifestations , Heavy Metal Antagonists )</li> </ul>	A, B, C
8	2	<ul style="list-style-type: none"> <li>○ Non-Metallic Environmental Toxicants (Air and water pollutants, Organic Solvents and Vapor, Utility gases Pesticides and other Agricultural Toxicants</li> </ul>	A, B, C
9	2	4. <b>Teratogenic and Carcinogens</b> <ul style="list-style-type: none"> <li>➤ Introduction on teratogenesis and Carcinogenesis</li> <li>➤ Mechanisms of teratogenesis and Carcinogenesis</li> <li>➤ Chemical having teratogenic and carcinogenic effects</li> </ul>	A, B
10	2	5. <b>Clinical Toxicology of some chemicals, drugs and household agents</b> <ul style="list-style-type: none"> <li>➤ Narcotic analgesics, NSAIDs (Salicylates )</li> <li>➤ Barbiturates</li> <li>➤ Alkaloids</li> </ul>	A, E
11	2	<ul style="list-style-type: none"> <li>➤ Phenothiazines</li> <li>➤ Calcium Channel Blockers, <math>\beta</math>-Adrenergic Antagonists, Cardioactive Steroids, Methylxanthines and Selective <math>\beta</math>-2-Adrenergic Agonists</li> </ul>	A, B, D
12	2	<ul style="list-style-type: none"> <li>➤ Antipsychotics, Lithium, Cyclic Antidepressants and anesthetic drugs</li> <li>➤ Monoamine Oxidase Inhibitors, Serotonin Reuptake Inhibitors and Atypical Antidepressants</li> </ul>	A, B, D
13	2	Forensic Toxicology <ul style="list-style-type: none"> <li>➤ Def. and Scope</li> <li>➤ Examination Methods</li> </ul> Toxic effects of chemotherapeutic agent Cyanide	A, B, D
14	2	<ul style="list-style-type: none"> <li>➤ Drugs of abuse (<b>Presentation</b>)</li> <li>➤ Poisons of Animal Origin (venoms) (<b>Presentation</b>)</li> <li>➤ Poisons of plant origin (<b>Presentation</b>)</li> <li>➤ Cleaning &amp; polishing agents (<b>Presentation</b>)</li> <li>➤ Food &amp; food additives (<b>Presentation</b>)</li> </ul>	A, B, D
15	2	➤ <b>Hospital Visit and Case Presentations</b>	
16	2	➤ <b>Hospital Visit and Case Presentations</b>	
		<b>FINAL EXAM</b>	

**Module 14: Medicinal Chemistry Module II**  
**Module Name: Medicinal Chemistry Module II**  
**Module Category: Core**

**Module Code:** Phar-M3141

**Module Number:** 14

**Module weight in ECTS:** 5 ECTS

**Courses:**

**Medicinal Chemistry II (Phar3141) (5 ECTS)**

### **Module description**

Medicinal chemistry is a chemistry-based discipline involving aspects of biological, medical and pharmaceutical sciences. It is the application of chemistry in the context of human medicine. The general purpose of this Module is to train highly qualified pharmacists who are competent in the invention, discovery, design, identification and preparation of biologically active compounds, the study of their metabolism, the interpretation of their mode of action at the molecular level and the construction of structure-activity relationships. Besides, this module helps the student in their future carrier especially in pharmaceutical industry drug research and development sections, in research institutions and in universities. Students will gain an appreciation for the drug development process, together with brief introduction to the drug discovery and designing methods, and also deals with the chemistry of various classes of drugs that act on different systems and organs of human body, and reviews the general principles of drug action and the pharmacological activities of various classes of drugs. The major focus is on the molecular mechanisms of drug action, with a detailed discussion of one or more prototypes of each drug class, which includes drugs acting on; autonomic nervous system, central nervous system, Histamine and histamine antagonists, non-narcotic analgesics, drugs used in gout; Antidiabetics, cardiovascular drugs; vitamins; pesticides; diagnostic agents; expectorants and antitussives; non-steroidal and steroidal hormones, local and general anesthetics, chemotherapeutic and products of biotechnology.

**Module objective:** Upon completion of the module; students have concept of drug at molecular level to which they understand the effect of structure on the pharmacokinetics and Pharmacodynamics. Students are able to apply the knowledge in drug design, discovery and development.

### **Module competencies:**

- Understand and demonstrate principles and practice of medicinal chemistry
- Discuss and Practice on different methods employed in drug design that helps to drug discovery and development
- Ability to follow and critically interpret the latest advances in the theory and practice of medicinal Chemistry
- Describe, identify and classify drugs based on their chemical structure, pharmacological action and site of drug action
- Relate the relevance of structure to pharmacological action
- Explain the principles of drug action and the role of bonding in drug-target interactions
- Discuss and Analyze the structural activities relationships of different compounds
- Develop skill to identify and synthesize biologically active compounds using standard methods of synthesis
- Identify and Practice on naming of pharmaceutical products

- Understand the basic biotransformation of organic compounds
- Suggest chemistry based application of biologically active compounds in advance; evaluate the probable side effect and adverse reactions
- Participate in problem solving drug development strategies
- Describe the physicochemical properties of biologically active compounds and currently available drugs
- Apply the knowledge and skill in drug therapy decision making process
- Transfer knowledge obtained from medicinal chemistry

**Mode of Delivery:** Parallel

**Mode of Assessment:**

Quizzes (10%)

Laboratory (20%)

Tests (20%)

Assignments (10%)

Final Exam (40%)

### **Learning activities and teaching methods**

Interactive lectures, case studies, computer assisted learning, formative problem-solving exercises, self-directed learning through virtual learning environment and technologies.

### **Teachers' and students' role**

#### **Teacher's role**

Course instructors are expected to:

- Organize group discussions
- Provide lecture and guide students
- Providing assignments and feedbacks for students (reading, working)
- Prepare lecture note, Assignment topics and title for group discussions
- Select seminar title and advice students in preparation and presentations
- Prepare assessing questions and examine students
- Prepare cases

#### **Student's role**

Students are expected to:

- Attend each lecture classes and Be an active participant in class discussion (ask questions and answering questions)
- Read text books, lecture handouts and reference books
- Prepare and present seminar papers
- Analyze and evaluate different literatures, reference books and journal articles
- Present case studies
- Take exams

## Medicinal Chemistry Course Syllabus

<b>Course Title</b>	<b>Medicinal Chemistry II</b>	
<b>Course Code</b>	Phar3141	
<b>Course EtCTS (Course hour)</b>	5 (135 hrs)	
<b>Pre-requisite</b>	Medicinal Chemistry I	
<b>Co-requisite</b>	Pharmacology II	
<b>Course Description</b>	Medicinal Chemistry II is a continuation of medicinal chemistry I & covers; Diuretics and Cardiovascular agents, Chemotherapeutic agents which includes Antiseptics and Disinfectants, Preservatives, Antifungal agents, Antitubercular and Antileprotic agents, Topical agents, Antiviral agents, Antiprotozoal drugs, Anthelmintics, Antiscabies & Antipedicular agents, Sulfonamides, Antibiotics & Anticancer drugs; and Steroidal and Non Steroidal and related drugs.	
<b>Course Objectives</b>	After completion of this course, students will be able to understand drugs that will act on the kidney, cardiovascular system, drugs used for treatment of infectious diseases, vitamins and hormones.	
<b>Course Content</b>		
<b>Diuretics and Cardiovascular Drugs</b>	<ul style="list-style-type: none"> <li>○ Diuretics <ul style="list-style-type: none"> <li>▪ Carbonic anhydrase inhibitors</li> <li>▪ Loop diuretics</li> <li>▪ Thiazide diuretics</li> <li>▪ Potassium sparing diuretics</li> <li>▪ Osmotic diuretics</li> </ul> </li> <li>○ Antianginal agents and vasodilators</li> <li>○ Antihypertensive agents</li> <li>○ Drugs used for treatment of congestive heart failure</li> <li>○ Antiarrhythmic drugs</li> <li>○ Anti-anemic Agents</li> <li>○ Drugs for Hypotensive States</li> <li>○ Antihyperlipidemic drugs</li> <li>○ Coagulant and anticoagulants</li> </ul>	<b>10 hrs</b>
<ul style="list-style-type: none"> <li>▪ <b>Oral hypoglycemic Agents</b></li> <li>▪ <b>Chemotherapeutic Agents</b> <ul style="list-style-type: none"> <li>○ Introduction (1 hr.)</li> <li>○ Antiseptics &amp; disinfectants (1 hrs)</li> </ul> </li> </ul> <p>Definition, Classification, Alcohols and related compounds, Aldehydes, Phenols and their derivatives, Oxidizing agents, Halogen containing compounds, Cationic and anionic Surfactants, Dyes, Mercury compounds, Antiseptic nitro furan derivatives</p> <ul style="list-style-type: none"> <li>○ Preservatives (1 hr.)</li> </ul>		<b>2 hrs</b> <b>30 hrs</b>

<p>Definition, p-Hydroxybenzoic acid derivatives, p- Hydroxybenzoic acid derivatives, Other miscellaneous preservatives</p> <ul style="list-style-type: none"> <li>○ Antibacterial agents and related drugs (8 hr.) <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ <math>\beta</math>-lactam antibiotics and Glycopeptides</li> <li>▪ The amino glycosides</li> <li>▪ The tetracyclines</li> <li>▪ The macrolides</li> <li>▪ Chloramphenicol</li> <li>▪ Sulfonamides and related drugs</li> <li>▪ Quinolones</li> <li>▪ The polypeptides, polyenes and lincomycin</li> <li>▪ Antitubercular &amp; Antileprotic agents</li> <li>▪ Antimicrobial topical agents</li> <li>▪ Other antibacterial agents</li> </ul> </li> <li>○ Antifungal agents (2 hr.)</li> </ul> <p>Fatty acids, Substituted imidazoles and triazoles, Antifungal antibiotics (the polyenes and other), Miscellaneous antifungal agents</p> <ul style="list-style-type: none"> <li>○ Antiviral agents (6 hr.) <ul style="list-style-type: none"> <li>▪ Anti-HIV agents</li> <li>▪ Other antiviral drugs</li> </ul> </li> <li>○ Antiprotozoal agents (4 hr.) <ul style="list-style-type: none"> <li>▪ Antimalarial drugs</li> <li>▪ Drugs used in amebiasis, giardiasis &amp; trichomoniasis</li> <li>▪ Drugs used in other protozoal infections</li> </ul> </li> <li>○ Anthelmintic agents (2hr.)</li> </ul> <p>Antiscabies &amp; Antipedicular agents</p> <ul style="list-style-type: none"> <li>○ Antineoplastic agents (5 hr.) <ul style="list-style-type: none"> <li>▪ Chemotherapy</li> <li>▪ Alkylating agents</li> <li>▪ Antimetabolites</li> <li>▪ Antibiotics</li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>▪ <b>Vitamins and Coenzymes</b> <ul style="list-style-type: none"> <li>○ Fat-soluble vitamins</li> <li>○ Water-soluble vitamins</li> <li>○ Co-enzymes</li> </ul> </li> <li>▪ <b>Non Steroidal Hormones and Related Drugs</b> <ul style="list-style-type: none"> <li>○ Hormones of the hypothalamus</li> <li>○ Pituitary hormones</li> <li>○ Thyroid hormones and anti-thyroid drugs</li> <li>○ Parathyroid hormones</li> <li>○ Pancreatic hormones and related drugs</li> </ul> </li> <li>▪ <b>Steroidal Hormones and Related Drugs</b> <ul style="list-style-type: none"> <li>○ Male and female sex hormones, derivatives and related drugs</li> </ul> </li> </ul>	<p style="text-align: right;">2 hrs</p> <p style="text-align: right;">2 hrs</p>
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○ Adrenocorticoids		<b>2 hrs</b>
<b>Total</b>		<b>48 hrs</b>
<b>Mode of Delivery</b>		<ul style="list-style-type: none"> <li>▪ Lecture: 48hrs</li> <li>▪ Tutorial: 28hrs</li> <li>▪ Independent study hour: 40hrs</li> <li>▪ Seminar, Assignment: 12hrs</li> <li>▪ Assessment: 7hrs</li> </ul>
<b>Mode of Assessment</b>	<ul style="list-style-type: none"> <li>▪ Quizzes (10%)</li> <li>▪ Tests (30%)</li> <li>▪ Seminars and Assignments (20%)</li> <li>▪ Final Exam (40%)</li> </ul>	
<b>Text Book</b>	<i>Lemke, T.L. and Williams, D.A., Roche, V. F., Zito, W.S.Foye's Principles of Medicinal Chemistry, 6th. ed. Lippincott Williams &amp; Wilkins, 2008.</i>	
<b>Reference Books</b>	<ul style="list-style-type: none"> <li>- <i>Wilson-Gisvold-Doerge; Text book of organic medicinal chemistry and pharmaceutical chemistry. 12<sup>th</sup> edn.; Lippincott (USA), 2011.</i></li> <li>- <i>Carmen Avendano and J. Carlos Menendez, Medicinal Chemistry of Anticancer drugs, first edition, 2008</i></li> <li>- <i>Donald J. Abraham (Ed.). Burgers's medicinal Chemistry and Drug Discovery, 2006, 6th edn., voll-6, wiley-interscience (USA).</i></li> <li>- <i>J.H. Block and J.M. Beale, Gisvold, O. Wilson &amp; Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry, 11th. ed. Lippincott Williams &amp; Wilkins, 2004.</i></li> <li>- <i>Burger's Medicinal Chemistry and Drug discovery, Sixth edition, Volume 3: Cardiovascular Agents and Endocrines; 2003</i></li> <li>- <i>Burger's Medicinal Chemistry and Drug discovery, Sixth edition, Volume 5: Chemotherapeutic Agents; 2003</i></li> </ul>	

## **Module 15: Pharmaceutical Analysis**

**Module Name:** Pharmaceutical Analysis

**Module category:** Core

**Module Weight in ECTS:** 14 ECTS

**Module Number:** 15

**Module Code:** Phar-M3151

**Course Code:**

Pharmaceutical Analysis I: Phar3151 (7 EtCTS)

Pharmaceutical Analysis II: Phar3152 (7 EtCTS)

### **Module Description**

Pharmaceutical Analysis aims at cultivating students to the world of regulation, especially the areas of quality control, quality assurance and validation. It also encourages an interdisciplinary approach to problem solving in a modern analytical laboratory that is practiced at regulatory, pharmaceutical manufacturing and other setups. This module introduces students to different analytical techniques with a focus on the basic working principles of the instruments, applications and limitations of the techniques as well as data analysis. It also introduces the students to the principles of quality control and the regulatory process in assuring the quality, efficacy and safety of drug and drug products. In the module, students will be exposed to different techniques such as various classical methods including titration methods, simple physical and chemical tests for drugs, electro-analytical methods, biological methods, radiochemical methods, extraction and analysis techniques using chromatography, spectroscopic methods, mass spectrometry, and their applications in a wide number of key areas, particularly pharmaceutical, food, herbals and chemical analysis. The quality control aspect of diagnostic reagents and chemicals, medical instruments and medical supplies is also addressed.

**Module objective:** Upon completion of the module, the student should have: a mature understanding of the theory and application of modern analytical techniques for pharmaceutical analysis; the ability to select the analytical method of choice for a particular circumstance; a deeper understanding of the regulatory matters and quality assurance principles currently in practice for the manufacture and licensing of medicines; the ability to apply the modern knowledge gained in this course to provide practical solutions to real problems. It is intended to train highly qualified pharmacists with strong background in the quality assurance and quality control of pharmaceuticals and related products. It also familiarizes the student with the concepts of drug quality and QA in the supply chain system in routine pharmacy practice. It is also believed to supplement their understanding of therapeutic drug monitoring emphasizing on analytical aspects.

### **Module Competencies:**

- Realize the importance of pharmaceutical quality control and the regulatory process in assuring the quality, efficacy and safety of drug and related products
- Reflect on the importance of standards for assuring the quality of drug products and consider the availability of pharmacopoeial standards and the importance of good manufacturing processes
- Propose and implement the sampling and sample preparation procedures required for pharmaceutical analysis, and evaluate the appropriate methodologies and protocols for the required analytical goals
- To provide an up-to-date understanding of the principles and application of current analytical techniques for the quantitative and qualitative measurement of drugs in a variety of real world matrices e.g. pharmaceutical, biological and herbal

- Able to select the appropriate analytical techniques for a given sample type to detect and quantify organic molecules and their application in the investigation of real-world problems
- Confidently operate a range of instrumentation used in the modern pharmaceutical quality control laboratories
- Apply laboratory skills to perform tests and prepare written laboratory reports that provide a description of the experiment, demonstrate clear and logical reasoning, and provide an appropriate conclusion

**Mode of delivery:** Parallel

- Total study hours in the module:  $14 \times 27 = 378$ hrs
- Lecture: 117
- Tutorial: 16
- Seminars, assignments and presentations: 20
- Practical/ Laboratory: 72
- Home study: 133
- Assessment: 20
- Visit pharmaceutical industry quality control unit: 6 hrs

**Mode of assessment**

- Seminar presentations
- Group assignments
- Laboratory works and report writing
- Practical exams
- Laboratory written exams
- Tests
- Quizzes
- Final Exam

**Learning Activities and Teaching Methods**

**A. Learning Activities**

Students are expected to undertake among others the following major learning activities:

- Engage in learning by doing (independent study, group assignments, presentation, report writing, and etc...)
- Participation and discussions in and outside the classroom
- Practical laboratory works including reagent and sample preparation, analysis, interpretation and report writing

**B. Teaching Methods**

- The course facilitator is expected to lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments,
- Arrange and facilitate seminar sessions by inviting professionals for public lectures or practical works
- Facilitate and organize attachment to quality control laboratories
- Guide the students towards other specific/relevant sources of information

**Roles of Instructors and Students**

**A. Roles of Instructors**

The instructor is expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)

- Read, comment and provide feedback on assignments of students on time
- Prepare his/her lessons and deliver lectures
- Guide laboratory works
- Provide available and necessary reference materials
- Encourage active participation of students in the teaching learning process
- Assist students with learning difficulties
- Arrange attachment sites

### **B. Roles of Students**

Students are expected to:

- Engage in learning by doing (independent study, project work, group work, etc.)
- Be active learners (participate effectively in group assignments, give presentations, write reports, etc.)
- Be active participants during the laboratory experiments and compile and submit laboratory reports on time Critically read relevant journal articles and related topics from book chapters

## Pharmaceutical Analysis Module syllabi

**Module Number: 15**

**Course Title: Pharmaceutical Analysis I**

**Course Code: Phar3151**

**Course ECTS: 7**

**Pre-requisite: None**

**Course Description:** This course covers pharmaceutical quality control aspects, various titrimetric methods such as acid-base, argentometric, complexometric, non-aqueous and miscellaneous titrimetry methods. Besides, it also gives the student theoretical knowledge on applications of radiochemical and electrochemical techniques in quality control of pharmaceuticals. The course has 16 weeks of practical classes in which different titrimetric methods will be studied as employed in the estimation of the constituents of drugs included in the national drug list.

**Course Objectives:** After completing this course, students will be able to describe the purpose of pharmacopoeia, importance of quality control, steps involved in drug analysis, sample pretreatment, different analytical methods and their use in pharmaceutical analysis. They will also be able to propose suitable analytical technique for a sample, carry out analysis for different pharmaceuticals as well as handle validation of analytical procedures, interpret and report data obtained from an analysis.

### Supporting objectives:

- Describe what is meant by pharmaceutical analysis
- Explain Purpose of pharmaceutical analysis
- Describe quality control and quality assurance
- Perform basic calculations in pharmaceutical analysis
- Describe sample preparation for analysis
- Describe titrimetry
- Perform different titration
- Describe electrochemical method of analysis

### Reading Materials:

**Text Book:** Beckett, A.H. and Stenlake, J.B. Practical Pharmaceutical Chemistry, Parts I & II, 4th edn., The Athlone Press, London, 2001.

### Reference Books:

1. Connors, K.A. Textbook of Pharmaceutical Analysis, 3rd edition., 2007.
2. David G. Watson. Pharmaceutical Analysis, A Textbook for Pharmacy Students and Pharmaceutical Chemists, 5th Edition, 2020, Elsevier.
3. Gary D. Christian; Analytical chemistry, 6th edition, John Wiley and Sons INC., USA, 2004
4. USP/NF (Latest edition). The United States Pharmacopoeial convention, Inc. Rockville, MD., USA
5. British Pharmacopoeia (Latest edition), Her Majesty stationery office, London.
6. David Harvey. Modern analytical chemistry. 1st ed, Mc Graw Hill, Boston, 2000

Week	Contact hrs	Topic/sub-topic/chapter	Reading materials
1	4	1. Introduction to pharmaceutical analysis 1.1. Introduction to quality control and Quality Assurance (1)	

		<p>1.2. The compendia (3 hrs)</p> <p>1.2.1. Pharmacopoeia and other official methods</p> <p>1.2.2. General notices</p> <p>1.2.3. Monographs</p>	
2	4	<p>1.3. Analytical Errors and validation of analytical procedures (2 hrs)</p> <p>1.4. Basic calculations in pharmaceutical analysis (2 hrs)</p> <p>1.4.1. Percentage:</p> <ul style="list-style-type: none"> <li>- Percentage volume/volume (% V/V)</li> <li>- Percentage weight/volume (% W/V)</li> <li>- Percentage weight/weight (% W/W)</li> </ul> <p>1.4.2. Parts per million (ppm) and parts per billion (ppb)</p> <p>1.4.3. Molarity (M)</p> <p>1.4.4. Normality (N)</p> <p>1.4.5. Dilutions</p>	
3	4	<p>1.5. Physical and chemical properties of drug molecules (4 hrs)</p> <p>1.5.1. Calculation of pH</p> <p>1.5.2. Acidic and basic strength and pKa</p> <p>1.5.3. Buffers</p> <p>1.5.4. Drug stability and stability study</p>	Reference: 1,4,5
3	4	<p>2. Sample preparation for analysis (2 hours)</p> <p>2.1. Steps in chemical analysis</p> <p>2.2. Preliminary treatment of sample</p> <p>3. Titrimetry</p> <p>3.1. Introduction (1 hr)</p> <p>3.1.1. End point and equivalence point</p> <p>3.1.2. Direct titration, back titration and back titration with blank determination</p> <p>3.1.3. Calculations in titrimetry</p> <p>3.1.4. Titration curves</p>	
4	4	<p>3.2. Acid-Base titrations (4 hrs)</p> <p>3.2.1 Acid-Base titrations in aqueous media</p> <p>3.2.2 Acid-Base titrations in non-aqueous media</p> <p>3.2.3 Applications</p>	

5	4	<p>3.3. Precipitometric titrations (4 hrs)</p> <p>3.3.1. Limitations</p> <p>3.3.2. Solubility product</p> <p>3.3.3. Factors affecting solubility of precipitate</p> <p>3.3.4. Indicators</p> <p>3.3.5. Argentometric titrations</p> <ul style="list-style-type: none"> <li>- Mohr's method</li> <li>- Volhard's method</li> <li>- Fajan's method</li> </ul> <p>3.3.6. Mercurimetric titrations as substitutes for precipitation methods</p> <p>3.3.7. Applications</p>	
6	4	<p>3.4. Complexometric titrations (4 hrs)</p> <p>3.4.1. Introduction</p> <p>3.4.2. Basic principles of complexometric analysis</p> <p>3.4.3. General principles in disodium edetate titrations</p> <p>3.4.4. Indicators and end point detection</p> <p>3.4.5. Applications</p>	
7	4	<p>3.5. Redox titrations (4 hrs)</p> <p>3.5.1. Basic principles of redox titrations</p> <p>3.5.2. Redox indicators</p> <p>3.5.3. Principles and procedures in different types of redox titration</p> <ul style="list-style-type: none"> <li>- Potassium permanganate methods</li> <li>- Ceric sulfate methods</li> <li>- Iodimetric and Iodometric methods</li> <li>- Bromination methods</li> <li>- Potassium iodate methods</li> <li>- Potassium dichromate methods</li> </ul> <p>3.5.4. Applications</p>	

8	4	<p>3.6 Diazotization titration (1 hrs)</p> <p>3.6.1 Theory of diazotization reaction</p> <p>3.6.2 Applications</p> <p>3.7 Microfluidic paper-based analytical devices (<math>\mu</math>PADs) and other automated titration techniques (3 hours)</p> <p>3.7.1 Introduction, principles, equipment and applications</p>	
9	4	<p>4. Gravimetry (4 hours)</p> <p>4.1. Steps in gravimetric analysis</p> <p>4.2. Selected gravimetric methods</p> <p>4.3. Applications</p>	
10	4	<p>5. Limit tests (4 hours)</p> <p>5.1. Definition and importance</p> <p>5.2. Limits on ash values</p> <p>5.3. Limits on moisture content: Importance, Los on drying method, Azeotropic distillation method, Karl-Fischer titration method, Other methods</p> <p>5.4. Limit tests for some metals: Lead, Arsenic, and Iron</p> <p>5.5. Limit tests for some non-metals: Chloride, Sulphate</p>	
11	4	<p>6. Electro-analytical methods</p> <p>6.1 Introduction (2 hrs)</p> <p>1.1.1. Electrochemical cells</p> <p>1.1.2. Various types of electrodes</p> <p>1.1.3. Instrumentation and measurement of cell e.m.f.</p> <p>6.2 Potentiometry (2 hrs)</p> <p>6.2.1 Principle</p> <p>6.2.2 Applications in pharmaceutical analysis</p>	
12	4	<p>6.3 Conductometry (1 hrs)</p> <p>6.3.1 Principles</p> <p>6.3.2 Apparatus and measurement</p>	



13	4	<p>6.3.3 Applications of direct conductometric methods (1 hour)</p> <p>6.4 Coulometry (3 hrs)</p> <p>6.4.1 Principles</p> <p>6.4.2 Apparatus and measurement</p> <p>6.4.3 Applications of coulometric methods</p>	
14	4	<p>6.5 Voltammetry (4 hours)</p> <p>6.5.1 Principles</p> <p>6.5.2 Apparatus and measurement</p> <p>6.5.3 Types of voltammetric methods</p> <p>6.5.4 Applications of voltammetric methods</p>	
15	4	<p>6.6 Electro-analytical sensors and their application in pharmaceutical analysis (4 hours)</p>	
16	4	<p>7 Radiochemical techniques (4 hours)</p> <p>7.1 Introduction</p> <p>7.1.1 Radioactivity</p> <p>7.1.2 Radioisotopes</p> <p>7.1.3 Radioactive decay</p> <p>7.1.4 Fate of different types of radiation</p> <p>7.1.5 Radiation limits</p> <p>7.1.6 Stability of radioactive compounds</p> <p>7.2 Measurement of radioactivity</p> <p>7.2.1 Ion collection method</p> <p>7.2.2 Scintillation technique</p> <p>7.2.3 Other techniques</p> <p>7.3 Analytical applications of radioisotopes in pharmacy</p>	
17	4	<p>8 Introduction to quality control (QC) for different dosage forms</p>	

		8.1 General tests for Dosage forms: Dissolution, Disintegration, Hardness, Clarity etc... 8.2 Visual inspection as a tool for QC	
18	4	9. Identification of Counterfeit and Substandard products (4 hrs)	
19	4	10. QRM in drug analysis, introduction, principles, WHO check list (4 hrs)	
<b>20</b>		<b>FINAL EXAM</b>	

**Mode of Delivery:**

- Lecture: 59
- Tutorial: 10
- Seminars, assignments and Presentation: 10
- Practical/ Laboratory: 36
- Home study: 66
- Assessment: 10

**Mode of Evaluation**

- Seminar and assignments: 10%
- Laboratory written exams and report writing: 10%
- Practical exams: 10%
- Quizzes: 10%
- Tests: (10%)
- Final Exam: 50%

**Module Number: 15**

**Course Title: Pharmaceutical Analysis II**

**Course Code:** Phar3152

Course ECTs: 7

**Co-requisite: NONE**

**Pre-requisite:** Pharmaceutical Analysis I

**Course Description:** The course deals with the principles, instrumentation and applications of important instrumental analytical techniques such as spectroscopic methods including UV-Visible, atomic absorption/emission, fluorescence, IR and nuclear magnetic resonance spectroscopy; chromatographic methods including Gas Chromatography and High Performance Liquid Chromatography; as well as mass spectrometry in the quality control of pharmaceutical products. Biological methods of analysis; basic coverage on bio-analysis; the QC aspects of herbal drugs, medical equipment, medical supplies and diagnostic kits; and QA in supply chain systems have been included. The course has 16 weeks of practical classes in which different instrumental analytical techniques will be performed as employed in the estimation of the constituents of drugs included in the national drug list.

**Course Objectives:** After completing this course, students will be able to describe the principles and instrumentation of different modern instrumental analytical techniques and their use in pharmaceutical and biochemical analysis. They will also be able to propose suitable analytical technique for a sample, carry out analysis for different pharmaceuticals as well as handle, interpret and report data obtained from the analysis.

• **Supporting objectives:**

- Describe UV-Visible spectroscopy
- Describe infrared spectroscopy
- Describe fluorescence spectroscopy
- Describe atomic spectroscopy
- Describe mass spectroscopy
- Identify different chromatographic techniques
- Describe gas chromatography
- Describe high performance liquid chromatography
- Describe biological methods of analysis

**Reading Materials:**

**Text Book:** Beckett, A.H. and Stenlake, J.B. Practical Pharmaceutical Chemistry, Parts I & II, 4th edn., The Athlone Press, London, 2001.

**Reference Books:**

1. Connors, K.A. Textbook of Pharmaceutical Analysis, 3rd edition., 2007
2. David G. Watson. Pharmaceutical Analysis, A Textbook for Pharmacy Students and Pharmaceutical Chemists, 5th Edition, 2020, Elsevier.
3. Gary D. Christian; Analytical chemistry, 6th edition, John Wiley and Sons INC., USA, 2004
4. USP/NF (Latest edition). The United States Pharmacopoeial convention, Inc. Rockville, MD, USA
5. British Pharmacopoeia (Latest edition), Her Majesty stationery office, London.
6. David Harvey. Modern analytical chemistry. 1st ed, Mc Graw Hill, Boston, 2000.

7. Francis Rouessac and Annick Rouessac, Chemical Analysis, Modern instrumental methods and techniques, 2nd ed, John Wiley and Sons, LTD, England, 2013.
8. Satinder Ahuja and Michael W. Dong. Handbook of Pharmaceutical Analysis by HPLC. 1st ed, volume 6, Elsevier Academic Press, New York, 2005.

Week	Contact hrs	Topic/sub-topic/chapter	Reading materials
1	4	<ol style="list-style-type: none"> <li>1. Analytical instruments and their calibration; validation; regulatory requirements (2 hrs)</li> <li>2. UV- Visible spectrophotometry               <ol style="list-style-type: none"> <li>2.1.Introduction</li> </ol> </li> </ol>	
2	4	<ol style="list-style-type: none"> <li>2.2. Factors governing absorption of radiation in the UV/Visible region               <ol style="list-style-type: none"> <li>2.2.1. The concept of chromophore and auxochrome</li> <li>2.2.2. Absorption intensity shifts</li> <li>2.2.3. Effect of pH on absorption</li> <li>2.2.4. Conjugated dienes and the Woodward-Fieser rules</li> </ol> </li> </ol>	
3	4	<ol style="list-style-type: none"> <li>2.3.Instrumentation               <ol style="list-style-type: none"> <li>2.3.1. Radiation sources</li> <li>2.3.2. Monochromators</li> <li>2.3.3. Sample cells and compartments</li> <li>2.3.4. Detectors</li> <li>2.3.5. Recording systems</li> <li>2.3.6. Double and single beam instruments</li> </ol> </li> <li>2.4. Qualitative spectrophotometry</li> <li>2.5. Quantitative spectrophotometry               <ol style="list-style-type: none"> <li>2.5.1. The Beer-Lambert law and its limitations</li> </ol> </li> </ol> <p>Spectrophotometric titrations</p>	Reference: 1,4,5
3	4	<ol style="list-style-type: none"> <li>2.6.Analysis of binary mixtures</li> <li>2.7.Differential Spectrophotometry</li> <li>2.8.Derivative spectra</li> <li>2.9.Colorimetry               <ol style="list-style-type: none"> <li>2.9.1. General requirements for colored substances</li> <li>2.9.2. Chemistry in colorimetry</li> <li>2.9.3. Applications</li> </ol> </li> </ol>	

4	4	<p>3. Fluorescence spectrophotometry</p> <p>3.1.Introduction</p> <p>3.2.Instrumentation</p> <p>3.3.Structural requirements of fluorescent compounds</p>	
5	4	<p>3.4. Factors affecting fluorescence intensity</p> <p>3.5. Applications in pharmaceutical analysis</p> <p>4. Infrared Spectrophotometry</p> <p>4.1.Introduction</p>	
6	4	<p>4.2.Instrumentation:</p> <p>Dispersive, FTIR and NIR, Radiation sources, Monochromators, Detectors, Recorders and display</p> <p>4.3. Fundamental vibrations and factors affecting vibration frequency</p> <p>4.4. Sample preparation</p> <p>4.5. Scanning IR spectra.</p> <p>4.6. Interpretation of the spectra</p> <p>4.7. Applications</p> <p>4.7.1. IR spectrophotometry as a fingerprint technique</p> <p>4.7.2. Quantitative IR analysis</p> <p>4.7.3. IR spectrophotometry in structure elucidation</p>	
7	4	<p>5. Atomic spectrophotometry</p> <p>5.1.Introduction</p> <p>5.2. Types of atomic spectrophotometric techniques</p> <p>5.2.1. Atomic absorption spectrophotometry (AAS) techniques</p> <p>5.2.2. Atomic emission spectrophotometry (AES) techniques</p> <p>5.3. Instrumentation</p> <p>5.4. Applications</p>	
8	4	<p>5.5.Other elemental analysis techniques ( X-Ray Fluorescence, etc)</p> <p>6. Nephelometry and Turbidimetry</p>	

		6.1. Introduction 6.2. Instrumentation 6.3. Pharmaceutical applications	
9	4	7. Introduction to chromatography 7.1. History and principles 7.2. Classifications 7.3. Definition of terminologies 7.4. TLC 7.5. HPTLC 8. Gas Chromatography (GC) 8.1. Introduction	
10	4	8.2. Instrumentation 8.3. Carrier gas cylinder, Injection port, column and column oven, detectors, recorders and integrators 8.4. Factors affecting choice of carrier gas 8.5. Temperature programming in GC 8.6. Pyrolysis and derivatization in GC 8.7. Qualitative and quantitative analysis by GC	
11	4	9. High performance liquid chromatography (HPLC) 9.1. Introduction and theory 9.2. Instrumentation Pump, injection system, column, detectors, data system 9.3. Stationary and mobile phases 9.4. Structural factors governing rate of elution of compounds 9.5. Evaluation of column performance	
12	4	9.6. Applications in: identification, quantitative analysis, chiral separation 9.7. Electrophoresis: high performance capillary electrophoresis	
13	4	10. Mass Spectrometry 10.1. Introduction 10.2. Instrumentation 10.3. Molecular fragmentation patterns 10.4. GC-MS and LC-MS: Introduction, Instrumentation and Application	
14	4	10.5. Applications in pharmaceutical analysis	

		<p>10. Nuclear magnetic resonance spectroscopy</p> <p>10.1. Introduction to <sup>1</sup>H NMR and <sup>13</sup>C NMR spectroscopy</p> <p>10.2. Basic instrumentation.</p> <p>10.3. The chemical shift Shielding and de-shielding effects</p> <p>10.4. Factors influencing the chemical shift</p> <p>Peak area and proton counting</p>	
15	4	<p>10.1. Important tips for interpreting NMR spectra.</p> <p>11. Biological methods of analysis</p> <p>11.1. Introduction</p> <p>11.2. Microbiological assay</p> <p>11.3. Pyrogen testing (in vivo &amp; in vitro)</p> <p>11.4. Microbial limit test</p> <p>11.5. Sterility test</p> <p>11.6. Preservative efficacy test</p>	
16	4	<p>12. Introduction to bio-analysis (2 hours)</p> <p>12.1. Biological samples and their preparation for analysis</p> <p>12.2. Sample extraction</p> <p>12.3. Biological sample analysis</p> <p>12.4. Applications; Therapeutic Drug Monitoring and others</p>	
17	4	<p>13. Introduction to herbal drugs quality control (3 hrs)</p> <p>13.1. Introduction</p> <p>13.2. Methods of herbal drugs quality control</p> <p>Challenges in standardization of herbal drugs</p>	
18	4	<p>14. Quality assurance in supply chain systems (2 hrs)</p> <p>14.1. Specifications preparation; bid evaluation that takes quality in to considerations</p> <p>15. 15. Quality documents;</p> <p>15.1. Certificate of analysis (COA) and its interpretation</p>	

19	4	16. Introduction to medical equipment, medical supplies and diagnostic kits quality control (2 hrs) 16.1. Introduction 16.2. Methods for quality control of medical equipment 16.3. Methods for quality control of medical supplies 16.4. Methods for the quality control of diagnostics 16.5. Challenges, limitations	
20		<b>FINAL EXAM</b>	

**Mode of Delivery:**

- Lecture: 58
- Tutorial: 10
- Seminars, assignments and Presentation: 10
- Practical/ Laboratory: 36
- Home study: 59
- Assessment: 10
- Visits to pharmaceutical firms and quality control laboratories: (6 hrs)

**Mode of Evaluation**

- Seminar and assignments: 10%
- Laboratory written exams and report writing: 10%
- Practical exams: 10%
- Quizzes: 10%
- Final Exam: 50%
- Quality control visit report: 10%



## **Module 16: Pharmacotherapeutics**

**Module name:** Pharmacotherapeutics module I

**Module category:** Core

**Module code:** Phar-M3161

**Module weight in ECTS:** 16 (16x27) = 432hrs

**Courses:**

<b>Course name</b>	<b>Course code</b>	<b>ECTS</b>
Physical Assessment	Intm3161	2 ECTS
Integrated therapeutics I	Phar3162	7 ECTS
Integrated therapeutics II	Phar3163	7 ECTS

### **Module description:**

Students will learn about the Pathophysiology and pharmacotherapy of various disease states that health care practitioners (pharmacists) may encounter in their practice settings. Courses in this module introduce essential therapeutic knowledge needed for providing pharmaceutical care in individual patient. These courses integrate the pathophysiologic abnormalities of disease state with concepts of drug selection, dose optimization and monitoring of therapeutic outcomes for safety and efficacy of medication. Courses discussed include: integrated therapeutics I-IV which extends from general principles of pharmacotherapy to detailed pharmacotherapy of each disease states (gastrointestinal, respiratory, cardiovascular, renal, hematologic, neurologic, psychiatric, endocrinologic, infectious diseases etc.)

### **Module objective:**

At the end of this module, the students are expected to:

- Explain the etiology, pathophysiology, clinical presentation and diagnosis of each disease states
- Set goals of treatment and select treatment options for the management of each disease states
- Formulate dose recommendations and pharmacokinetic considerations for individual patient management
- Monitor clinically significant adverse drug reactions and drug interactions
- Evaluate therapeutic outcomes for effectiveness, safety and patient adherence

- Develop and exercise pharmaceutical care planning for managing a specific patient condition
- Provide patient medication counseling and drug information

**Module competency:**

Provide patient centered Pharmaceutical care services

**Mode of delivery: Parallel**

**Mode of Assessment:**

Continuous assessment & summative assessment: Class attendance, Continuous assessment, Assignments, Hospital attachment Report, Final Exam

**Module learning teaching methods**

Illustrated lectures and group discussions, Individual and group exercise and assignments, Role plays and case studies, Simulation, Audiovisuals, Clinical scenarios, Tutorials, demonstration

## **Physical Assessment course guide book/syllabus**

**Course Name: Physical Assessment**

**Course code:** Intm3161

**Module name:** Pharmacotherapeutics Module I

**Module code:** Phar-M3161

**Course ECTS: 2 ECTS Non Credit (NC)**

**Totally required hours for the module:** **2 X 27 = 54**

**Lecture hours:** 13 hrs

**Home Study:** 13 hrs

**Demonstration/ clinical simulation:** 13 hrs

**Bedside presentation:** 10 hrs

**Assessment:** 5 hrs

**Year/Semester Course is offered:** Year III/Semester I

**Course Co-requisite/s:** **Integrated Therapeutics I**

### **Course Description**

This physical diagnosis course for year five UG students is to have basic knowledge in history taking and to demonstrate how to do physical examinations. Major physical assessment skills (inspection, palpation, percussion and auscultation) will be discussed and demonstrated. The purpose of this course for pharmacy student is to enable pharmacy graduates make physical examination and monitor drug effectiveness and toxicity.

### **Course Objectives**

- To be able to take medical history and perform proper physical examination with effective communication.

#### **Specific Course Objectives:**

At the end of this course the students will be able to

- Describe the common terminologies used in normal and abnormal findings in the history and physical examination
- Communicate effectively and sensitively with patient and the relative to extract relevant information about the patient's problem at the background of his whole life
- Demonstrate a methodological approach to perform physical examination
- Analyze and interpret the history and physical findings in scientifically sound way

**Course of delivery:** **Block**

**Course Teaching and Learning Methods:**

- Interactive presentation
- Role play
- Demonstration
- Patient interview and physical examination
- Bedside teaching

**Assessment Techniques:**

- |  |     |
|--|-----|
| • Tests and quizzes                                    | 10% |
| • Assignments  | 10% |
| • Simulated patient interview and physical examination | 40% |
| • Written exam:  | 40% |

**Teachers’ and students’ role**

**Roles of Instructors**

Instructors should be well versed in the outcomes expected of students and the pedagogical methods that best enhance learning. Accordingly, they will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Closely supervise in actual practice in different clinical and community settings
- Assists students in resolving ever-increasing ethical dilemma in the service delivery
- Foster and assess self-initiated student learning
- Read and comment assignments of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials
- Encourage active participation of students in the teaching learning process;
- Strive to be the role model ethically and professionally

**Roles of Students**

Students are expected to:

- Make every effort to apply valid research findings and theoretical teachings into practice in various practice settings
- Engage in learning by doing independent study, project work; group work, etc..
- Be active learners (participate effectively in group assignments, perform practice actively, make presentations, write reports, prepare seminars etc.);
- Critically assess laws, regulations, journal articles and related topics from different sources

**References:**

### Required readings (Text)

1. Lynn Bickley (2012). Bates' Guide to Physical Examination and History-Taking, 11<sup>th</sup>, Lippincott Williams & Wilkins.
2. Karen J. Tietze (2011). Clinical Skills for Pharmacists: A Patient-Focused Approach, 3<sup>rd</sup> edition, Mosby publisher.

### Recommended readings

3. Henry M. Seidel, Rosalyn W. Stewart, Jane W. Ball, Joyce E. Dains, John A. Flynn, Barry S. Solomon, Rosalyn W. Stewart (2010). Mosby's Guide to Physical Examination, 7<sup>th</sup> edition, Mosby publisher.
4. Jane W. Ball, Joyce E. Dains, John A. Flynn, Barry S. Solomon, Rosalyn W. Stewart (2014). Seidel's Guide to Physical Examination, 8<sup>th</sup> edition, Mosby publisher.

### Course Schedule

Week	Contact hr	Topic/sub-topic/chapter/Assessments/Assignments	Reading Material
1	2	Introduction: (patient history taking, the process of physical assessment, equipments for physical examination)	Reference No. 1,2
	2	Vital signs, skin,	
	2	Breast, head and neck	
	2	Chest and lungs, abdomen, genitourinary system	
	2	Musculo-skeletal, neurologic system	
2	16	Demonstration/ clinical simulation	
	12	Bedside presentation	
	6	Assessment:	

## Course syllabus

<b>Integrated therapeutics I Course syllabus</b>	
<b>Course name:</b> Integrated Therapeutics I	
<b>Course code:</b> Phar3162	
<b>Module name:</b> Pharmacotherapeutics module	
<b>Module code:</b> Phar-M3161	
<b>Course ECTS:</b> 7 ECTS	
<b>Totally required hours for the module:</b> $7 \times 27 = 189$ hours	
<b>Lecture:</b>	60 hours
<b>Ward attachment:</b>	30 hours
<b>Tutorial:</b>	34 hours
<b>Home study:</b>	46 hours
<b>Assessment:</b>	14 hours
<b>Project work/presentation:</b>	15 hours
<b>Year/Semester course offered:</b> Year III/Semester I	
<b>Pre-requisite if any:</b> Pharmacology I	
<b>Co-requisite:</b>	
<b>Course description:</b>	
<p>This course is designed to introduce the pharmacy student to the study of integrated therapeutics. It will provide introductory information designed to assist the student to begin understanding the rationale upon which many drug therapy decisions are based. Principles, concepts, processes, and skills in pharmacotherapy will be emphasized. Therapeutic topics and case studies will be used to provide students with the opportunity to apply these skills.</p> <p>This course will also enable students to understand and interpret the common diagnostic tests. Gastrointestinal and dermatological disorders will be addressed in the therapeutics section</p>	
<b>Course objectives:</b>	
At the completion of this course the student should be able to:	
1. Apply the Pharmacists' Patient Care Process	
2. Perform a brief patient assessment, including: ○ Interviewing a patient ○ Obtaining current medication list	
3. Identify drug therapy problems by evaluating drugs for indication, effectiveness, safety, convenience	
4. Develop individualized and clinically appropriate care plans for a patient with one to three simple conditions	
5. Educate patients on their drug therapy and assess for patient understanding	
6. Communicate effectively with all patients and their families	

7. Accept responsibility of providing continuing care to patients
8. understand the various factors that may influence drug therapy in a patient
9. Understand how to gather relevant patient information during drug therapy
10. Interpret common diagnostic tests used
11. Understand the etiology, pathophysiology, diagnosis, treatment and monitoring parameters of therapy outcomes in the management of common gastrointestinal and dermatological disorders

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

During this course the following mode of teaching will be employed:

- Illustrated lectures and group discussions
- Individual and group exercise and assignment
- Ward attachment at least 2 hours/day, one afternoon a week
- Role plays and case studies
- Simulation
- Audiovisuals
- Clinical scenarios
- Tutorials
- Demonstration

**Assessment mechanisms:**

- Quizzes: 10%
- Seminar presentations: 10%
- Mid Exam: 20%
- Bedside presentation: 15%
- Assignments 5%
- Final Exam 40%

**Teachers' and students' role**

**Roles of Instructors:**

Instructors should be well versed in the outcomes expected of students and the pedagogical methods that best enhance learning. Accordingly, they will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Closely supervise in actual practice in different clinical and community settings
- Assists students in resolving ever-increasing ethical dilemma in the service delivery
- Foster and assess self-initiated student learning
- Read and comment assignments of students on time
- Prepare his/her lessons and deliver lectures

- Provide available and necessary reference materials
- Encourage active participation of students in the teaching learning process;
- Strive to be the role model ethically and professionally

### **Roles of Students**

Students are expected to:

- Make every effort to apply valid research findings and theoretical teachings into practice in various practice settings
- Engage in learning by doing independent study, project work; group work, etc.
- Be active learners (participate effectively in group assignments, perform practice actively, make presentations, write reports, prepare seminars etc.);
- Critically assess laws, regulations, journal articles and related topics from different sources

### **References:**

#### **Required readings (Text)**

1. Lee, Mary. American Society of Health-System Pharmacists. Basic skills in interpreting laboratory data Ashp Publication, 2017
2. Dipiro JT, Talbert RL, Yee GC, et.al. Pharmacotherapy, a Pathophysiologic Approach. 10<sup>th</sup> or later edition.
3. A Practical Guide to Pharmaceutical Care, American Pharmacists Association, 3<sup>rd</sup> edition.

#### **Recommended readings**

4. Koda - Kimble MA, Young LY, Kradjan WA, et.al. Applied Therapeutics, The Clinical Use of Drugs. 11<sup>th</sup> or later edition.
5. Walker R and Edwards C. Clinical Pharmacy and Therapeutics. 3rd or later edition.
6. Kasper, Braunwald, et al. Harrison's Principles of Internal Medicine, 20<sup>th</sup> or later edition
7. Tierney, McPhee, Papadakis. Current Medical Diagnosis and Treatment 2020 or later edition
8. Conn's Current therapy 2020
9. Washington Manual of Medical Therapeutics 32<sup>nd</sup> edition
10. Jacobs & DeMott Laboratory Test Handbook, 5th edition
11. Handouts including copies of PowerPoint slides from lectures
12. Guidelines and articles as specified by the instructor

### **Course Schedule**



Week #	Contact hrs	Topic/sub-topic/chapter/Assessments/Assignments	Reading Material
1	2 hrs	<b>Introduction to Pharmacotherapy</b>	Reference No. 1, 3, 10
	2 hrs	<b>An overview of pharmaceutical care:</b> The pharmacist in patient care, medical terminologies & common medical abbreviations, pharmaceutical care as a general practice	
	2 hrs	<i>Bed-side/ward attachment</i>	
2	2 hrs	<b>An overview of pharmaceutical care:</b> Clinical & economic impact of pharmaceutical care practice, Practice responsibilities, The practitioner's philosophy of practice	
	2 hrs	<b>An overview of pharmaceutical care: <i>Pharmaceutical care process</i></b> (Assessment: drug related needs, components of drug therapy problems, identification of drug therapy problems)	
	2 hrs	<i>Bed-side/ward attachment</i>	
3	2 hrs	<b>An overview of pharmaceutical care: <i>Pharmaceutical care process</i></b> (care plan: establishing goals of therapy, interventions, schedule and plan for follow-up)	
	2 hrs	<b>An overview of pharmaceutical care: <i>Pharmaceutical care process</i></b> (follow-up evaluation: determining the clinical outcome status, evaluation for new drug therapy problems, schedule for continuous follow-up evaluations)	
	2 hrs	<i>Bed-side/ward attachment</i>	
4	2 hrs	<b>An overview of pharmaceutical care:</b> documentation in pharmaceutical care, ethical considerations in practice	
	2 hrs	<b>Diagnostic Tests:</b> General principles	
	2 hrs	<i>Bed-side/ward attachment</i>	
4	2 hrs	<b>Diagnostic Tests:</b> Electrolytes	
	2 hrs	<b>Diagnostic Tests:</b> Electrolytes	
	2 hrs	<i>Bed-side/ward attachment</i>	
5	2 hrs	<b>Diagnostic Tests:</b> Hematology	
	2 hrs	<b>Diagnostic Tests:</b> Hematology	
	2 hrs	<i>Bed-side/ward attachment</i>	
5	2 hrs	<b>Diagnostic Tests:</b> Renal function tests	
	2 hrs	<b>Diagnostic Tests:</b> Renal function tests	
	2 hrs	<i>Bed-side/ward attachment</i>	
6	2 hrs	<b>Diagnostic Tests:</b> Liver function tests	
	2 hrs	<b>Diagnostic Tests:</b> Liver function tests	
	2 hrs	<i>Bed-side/ward attachment</i>	
7	2 hrs	<b>Diagnostic Tests:</b> Urinalysis	
	2 hrs	<b>Diagnostic Tests:</b> Cardiovascular tests	
	2 hrs	<i>Bed-side/ward attachment</i>	
8	2 hrs	<b>Diagnostic Tests:</b> Endocrine function tests	

	2 hrs	<b>Diagnostic test:</b> Lipid Panel	
	2 hrs	<i>Bed-side/ward attachment</i>	
9	2 hrs	<b>Diagnostic Tests:</b> Pulmonary Function Testing	
	2 hrs	<b>Diagnostic Tests:</b> Microbiology	
	2 hrs	<i>Bed-side/ward attachment</i>	
10	2 hrs	Diagnostic imaging and common bed-side procedures	
		Basic electrocardiography, echocardiography	
	2 hrs	<i>Bed-side/ward attachment</i>	
	2 hrs	50% Assessment	
10	2 hrs	<b>Drug Therapy in Specific Patient Groups:</b> Neonates and Pediatrics	
	2 hrs	<b>Drug Therapy in Specific Patient Groups:</b> Geriatrics	
11	2 hrs	<b>Drug Therapy in Specific Patient Groups:</b> Pregnancy and lactation	Reference No. 1, 3, 5
	2 hrs	<b>Gastrointestinal Disorders therapeutics:</b> Gastrointestinal tract evaluation & GERD	Reference No. 1, 3, 6
	2 hrs	<i>Bed-side/ward attachment</i>	
12	2 hrs	<b>Gastrointestinal Disorders therapeutics:</b> IBD, IBS,	
	2 hrs	<b>Gastrointestinal Disorders therapeutics:</b> Peptic ulcer disease	
	2 hrs	<i>Bed-side/ward attachment</i>	
13	2 hrs	<b>Gastrointestinal Disorders therapeutics:</b> Nausea, Vomiting, Constipation and Diarrhea	
	2 hrs	<b>Gastrointestinal Disorders therapeutics:</b> Drug induced liver disease, Pancreatitis	
	2 hrs	<i>Bed-side/ward attachment</i>	
14	2 hrs	<b>Gastrointestinal Disorders therapeutics:</b> Portal hypertension & cirrhosis	
	2 hrs	<b>Gastrointestinal Disorders therapeutics:</b> Viral hepatitis	
	2 hrs	<i>Bed-side/ward attachment</i>	
15	2 hrs	Respiratory disorders Pharmacotherapy: Asthma	
	2 hrs	Respiratory disorders Pharmacotherapy: COPD	
	2 hrs	<i>Bed-side/ward attachment</i>	
16	2 hrs	Respiratory disorders Pharmacotherapy: ARDS & Neonatal Respiratory distress syndrome –with pediatrics pharmacotherapy	
	2 hrs	Respiratory disorders Pharmacotherapy: Drug-induced pulmonary diseases and cystic fibrosis	Reference1, 6
	2 hrs	<i>Bed-side/ward attachment</i>	
		<b>50% Assessment</b>	
<b>Integrated therapeutics II Course syllabus</b>			

<b>Course Name: Integrated Therapeutics II</b>
<b>Course code:</b> Phar3163
<b>Module name:</b> Pharmacotherapeutics module
<b>Module code:</b> Phar-M3161
<b>Course ECTS:</b> 7 ECTS
<p><b>Totally required hours for the module:</b> 7x27 = 189 hours</p> <p><b>Lecture:</b> 60 hours</p> <p><b>Ward attachment:</b> 30 hours</p> <p><b>Tutorial:</b> 34 hours</p> <p><b>Home study:</b> 46 hours</p> <p><b>Assessment:</b> 14 hours</p> <p><b>Project work/presentation:</b> 15 hours</p>
<b>Year/Semester Course is offered:</b> Year III/Semester II
<b>Pre-requisite if any:</b> Integrated Therapeutics I
<p>Course description:</p> <p>This course is a continuation of Integrated therapeutics-I. The purpose of this course is to provide didactic framework for the therapeutic management of a number of common diseases, including renal diseases, cardiovascular diseases, endocrine diseases, pulmonary diseases, and Eye and ENT. With a thorough background established in physiology, pharmacology, pharmacokinetics and other courses in the curriculum, the goal of this course is to prepare students to develop rational drug therapy plans for patients, identify conditions for monitoring pharmacotherapy in patients, and identify conditions associated with these common diseases that require referral.</p>
<p><b>Course objectives:</b></p> <p>After completion of this course, students will be able to explain, practice and choose appropriate treatment strategies for cardiovascular, respiratory, endocrine, and eye and ENT diseases so as to improve patient outcomes.</p> <p>To meet these objectives, students will:</p> <ul style="list-style-type: none"> <li>• Describe the pathophysiologic processes underlying the diseases</li> <li>• Analyze and interpret diagnostic findings</li> <li>• Recommend appropriate treatment regimen</li> <li>• Provide follow up and monitor outcome</li> </ul>
<b>Course mode of delivery:</b> Parallel

### **Course learning and teaching methods**

During this course the following mode of teaching can be used:

- Illustrated lectures and group discussions
- Individual and group exercise and assignments
- Role plays and case studies
- Problem based learning
- Simulation
- Audiovisuals
- Clinical scenarios
- Tutorials
- Demonstration
- Ward attachment

### **Assessment mechanisms:**

- |                          |     |
|--------------------------|-----|
| • Quizzes:               | 10% |
| • Seminar presentations: | 10% |
| • Mid Exam:              | 20% |
| • Bedside presentation:  | 15% |
| • Assignments            | 5%  |
| • Final Exam             | 40% |

### **Teachers' and students' role**

#### **Roles of Instructors:**

Instructors should be well versed in the outcomes expected of students and the pedagogical methods that best enhance learning. Accordingly, they will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Closely supervise in actual practice in different clinical and community settings
- Assists students in resolving ever-increasing ethical dilemma in the service delivery
- Foster and assess self-initiated student learning
- Read and comment assignments of students on time
- Prepare his/her lessons and deliver lectures
- Provide available and necessary reference materials
- Encourage active participation of students in the teaching learning process;
- Strive to be the role model ethically and professionally

#### **Roles of Students**

Students are expected to:

- Make every effort to apply valid research findings and theoretical teachings into practice in various practice settings
- Engage in learning by doing independent study, project work; group work, etc..
- Be active learners (participate effectively in group assignments, perform practice actively, make presentations, write reports, prepare seminars etc.);
- Critically assess laws, regulations, journal articles and related topics from different sources

### References:

#### Required readings (Text)

1. Dipiro JT, Talbert RL, Yee GC, et.al. Pharmacotherapy, a Pathophysiologic Approach. 10<sup>th</sup> or later edition.

#### Recommended readings

2. Koda - Kimble MA, Young LY , Kradjan WA, et.al. Applied Therapeutics, The Clinical Use of Drugs. 11<sup>th</sup> or later edition.
3. Walker R and Edwards C. Clinical Pharmacy and Therapeutics. 3rd or later edition.
4. Kasper, Braunwald, et al. Harrison’s Principles of Internal Medicine, 20<sup>th</sup> or later edition
5. Tierney, McPhee, Papadakis. Current Medical Diagnosis and Treatment 2020 or later edition
6. Conn’s Current therapy 2020
7. Washington Manual of Medical Therapeutics 32<sup>nd</sup> edition
8. Jacobs & DeMott Laboratory Test Handbook, 5th edition
9. Handouts including copies of PowerPoint slides from lectures
10. Guidelines and articles as specified by the instructor

### Course Schedule

Week	Contact hrs	Topic/sub-topic/chapter/Assessments/Assignments	Reading Material
1	2 hrs	Renal disorders Pharmacotherapy: Acute Kidney Injury (AKI)	Reference No. 1,3
	2 hrs	Renal disorders Pharmacotherapy: Chronic Kidney Disease (CKD)	Reference No. 1, 3
	2 hrs	<i>Bed-side/ward attachment</i>	
2	2 hrs	Renal disorders Pharmacotherapy: Drug induced Renal Disease	Reference No. 1, 3
	2 hrs	Renal disorders Pharmacotherapy: Glomerulonephritis	Reference No. 1, 3,6
	2 hrs	<i>Bed-side/ward attachment</i>	

2	2 hrs	Renal disorders Pharmacotherapy: Acid-base disorders	
	2 hrs	Renal disorders Pharmacotherapy: Disorders of fluid and electrolyte homeostasis	
	2 hrs	<i>Bed-side/ward attachment</i>	
3	2 hrs	Renal disorders Pharmacotherapy: Hemodialysis and peritoneal dialysis	Reference No.1, 3
	2 hrs	Case studies on acute renal failure, chronic renal failure, drug induced kidney disease glomerulonephritis, acid-base disorders and disorders of fluid and electrolyte homeostasis	Reference 1,3, 6
	2 hrs	<i>Bed-side/ward attachment</i>	
4	2 hrs	Endocrine Disorder Pharmacotherapy: Thyroid disorder	Reference No. 1, 3, 6
	2 hrs	Endocrine disorder Pharmacotherapy: Diabetes mellitus	
	2 hrs	<i>Bed-side/ward attachment</i>	
5	2 hrs	Endocrine disorder Pharmacotherapy: Diabetes mellitus	
	2 hrs	Endocrine disorder Pharmacotherapy: Pituitary and adrenal gland Disorders	
	2 hrs	<i>Bed-side/ward attachment</i>	
6	2 hrs	Case studies on Endocrine Disorder	
	2 hrs	Cardiovascular disorders Pharmacotherapy: Cardiopulmonary Resuscitation	
	2 hrs	<i>Bed-side/ward attachment</i>	
7	2 hrs	Cardiovascular disorders Pharmacotherapy: Hyperlipidemia	
	2 hrs	Cardiovascular disorders Pharmacotherapy: Hypertension	
	2 hrs	<i>Bed-side/ward attachment</i>	
8	2 hrs	Cardiovascular disorders Pharmacotherapy: Heart failure	
	2 hrs	Cardiovascular disorders Pharmacotherapy: Rheumatoid Valvular Heart Disease	
	2 hrs	<i>Bed-side/ward attachment</i>	
8	2 hrs	Case Studies on Cardiovascular Disorders	
	2 hrs	<b>Mid Exam</b>	
9	2 hrs	Congenital Heart Diseases in Pediatrics	
	2 hrs	Cardiovascular disorders Pharmacotherapy: Ischemic Heart Disease & Acute coronary syndromes	
	2 hrs	<i>Bed-side/ward attachment</i>	
10	2 hrs	Cardiovascular disorders Pharmacotherapy: Ischemic Heart Disease & Acute coronary syndromes	

	2 hrs	Cardiovascular disorders Pharmacotherapy: Cardiac arrhythmia	
	2 hrs	<i>Bed-side/ward attachment</i>	
11	2 hrs	Cardiovascular disorders Pharmacotherapy: VTE	
	2 hrs	Cardiovascular disorders Pharmacotherapy: peripheral Arterial Disease	
	2 hrs	<i>Bed-side/ward attachment</i>	
11	2 hrs	Cardiovascular disorders Pharmacotherapy: Stroke	
	2 hrs	<b>50% continuous assessment report</b>	
12	2 hrs	Cardiovascular disorders Pharmacotherapy: Shock	Reference No. 1, 3, 5
	2 hrs	Case studies on selected cardiovascular disorders Pharmacotherapy	
	2 hrs	<i>Bed-side/ward attachment</i>	
13	2 hrs	<b>Pharmacotherapy of Dermatologic disorders:</b> dermatological drug reactions, allergic and pseudo-allergic drug reactions, self-treatable skin disorders	
	2 hrs	<b>Pharmacotherapy of Dermatologic disorders:</b> psoriasis, atopic dermatitis	
14	2 hrs	<b>Pharmacotherapy of Dermatologic disorders:</b> acne	Reference No. 1, 3, 6
	2 hrs	<i>Bed-side/ward attachment</i>	
15	2 hrs	Case studies on Asthma, COPD	
	2 hrs	Eye & ENT disorders Pharmacotherapy: Glaucoma	
	2 hrs	<i>Bed-side/ward attachment</i>	
16	2 hrs	Eye & ENT disorders Pharmacotherapy: Allergic Rhinitis, Case studies on glaucoma and Allergic rhinitis	
	2 hrs	<i>Bed-side/ward attachment</i>	
		<b>Final Exam</b>	

**Module Name: Pharmaceutical Technology I****Module Category:** Core**Module Code:** Phar-M3171**Module Number:** 17**Module Weight:** 3 ECTS**Courses:**

S/N	Course name	Course code	ECTS
1	Immunological and Biological Products	Phar3122	3

**Module Description**

The module comprehends the role of genetic engineering and allied technologies that have underpinned the development of a range of pharmaceutical products of modern biotechnology, collectively termed biopharmaceuticals (mainly immunological and biological products) that can be used in the pharmaceutical care of a patient. The emphasis will be to understand the application of recombinant DNA derived drugs (immunological and biological products) in pharmaceutical care of a patient. It also deals with handling of immunological and biological products and with the different therapeutic approaches such as gene therapy, antisense therapy, cell therapy and immunological principles (immunotechnology) that are used in prevention and diagnosis of diseases.

**Module Objective**

This module aims to introduce the students with the role of biotechnology and allied technologies in the development of a range of pharmaceutical products of modern biotechnology, and application of recombinant DNA derived drugs (immunological and biological products) in pharmaceutical care of a patient.

**Module Competency**

Upon a successful completion of this module/course, students will be capable of developing formulation and manufacture various pharmaceutical dosage forms (conventional and biopharmaceutical products) and evaluate their qualities.

**Module Mode of Delivery:**

- Block and Parallel

**Module teaching/learning methods****Learning Activities**

- Active participation during class lectures
- Engage in learning by doing
- Laboratory group work



**Teaching Methods**

- The instructor is expected to introduce concepts and topics, and give references, facilitate discussions, ask questions, correct assignments

**Module mode of Assessment****Formative and Summative assessments**

- Quizzes
- Laboratory reports
- Seminar Presentations
- Assignments
- Final exam

**Course Name:** Immunological and Biological Products

**Course code:** Phar3171

**Module Name:** Pharmaceutical Technology I

**Module Code:** Phar-M3171

**Course ECTS:** 3

**Totally required hours for the course:** 81 hrs

**Lecture hours:** 26

**Study hours:** 30

**Presentation:** 10

**Tutorial:** 5

**Assignment:** 10

**Year/Semester Course is offered:** Year III Semester II

**Course prerequisite/s:** Integrated Physical Pharmacy and Pharmaceutics I&II

**Course Description:**

This course designed to introduce the student the application of biotechnology in drug discovery and development. This course comprehends the role of genetic engineering and allied technologies that have underpinned the development of a range of pharmaceutical products of modern biotechnology, collectively termed biopharmaceuticals (mainly immunological and biological products) that can be used in the pharmaceutical care of a patient. The emphasis will be to understand the application of recombinant DNA derived drugs (immunological and biological products) in pharmaceutical care of a patient. It also deals with handling of immunological and biological products and with the different therapeutic approaches such as gene therapy, antisense therapy, cell therapy and immunological principles (immunotechnology) that are used in prevention and diagnosis of diseases.

**Course Objectives:**

- This course is designed to introduce the students with the role of biotechnology and allied technologies in the development of a range of pharmaceutical products of modern biotechnology, and application of recombinant DNA derived drugs (immunological and biological products) in pharmaceutical care of a patient.

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

- Active participation during class lectures
- Engage in learning by doing

- The course instructor is expected to introduce concepts and topics and give references, facilitate discussions, ask questions, correct assignments
- Arrange and facilitate excursions

#### **Assessment techniques:**

- Tests: 20%
- Quizzes: 15%
- Assignments: 15%
- Presentation: 10%,
- Final exam 40%

#### **Teachers' and students' role**

##### **Roles of Instructors**

##### **The instructor will be expected to:**

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments & exercises of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties

##### **Roles of Students**

##### **Students are expected to:**

- Engage in learning by doing (independent study, group works, etc.)
- Be active learners (participate effectively in group assignments, class activities, etc.);
- Should submit all group and/or individual assignments on due date
- Attend classes regularly

#### **References:**

1. Zink G. L., Biological Products, In Remington's Pharmaceutical Sciences, 23<sup>rd</sup> ed. Mack Publishing Co., Easton, 2020.
2. Arnold L. Demain, Julian E. Davies, Ronald M. Manuals of industrial microbiology and Biotechnology, 2nd ed. ASM press, Washington D.C.
3. Daan JA Crommelin and Robert D Sindelar: Pharmaceutical biotechnology: An introduction for Pharmacists and Pharmaceutical scientists. Harwood academic Publishers

4. Hugo, W. B. and Russell, A. D. Pharmaceutical Microbiology, 7<sup>th</sup> ed. 2004
5. S S Kori and M A Halakaia. Pharmaceutical biotechnology: Fundamentals and Applications. 2<sup>nd</sup> ed. 2005
6. B.D. Singh. Biotechnology. 2<sup>nd</sup> ed. Kaliani Publishers.2005
7. Internet

### Course Schedule

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments
1	2	<ul style="list-style-type: none"> <li>• Introduction to Biotechnology and Pharmaceutical Biotechnology</li> </ul>
1	2	<ul style="list-style-type: none"> <li>• Introduction to genetic engineering/rDNA technology               <ul style="list-style-type: none"> <li>○ Concepts in rDNA technology</li> </ul> </li> </ul>
2-3	4	<ul style="list-style-type: none"> <li>• Introduction to genetic engineering/rDNA technology (Continued...)               <ul style="list-style-type: none"> <li>○ Tools of genetic engineering (enzymes, cloning vectors, cloning hosts)</li> <li>○ Basic techniques (gene cloning, protein expression)</li> <li>○ Application of rDNA technology                   <ul style="list-style-type: none"> <li>▪ Polymerase chain reaction (PCR) and other techniques of modern biotechnology</li> </ul> </li> </ul> </li> </ul>
4-5	4	<ul style="list-style-type: none"> <li>• Immunological products and biological products               <ul style="list-style-type: none"> <li>○ General introduction                   <ul style="list-style-type: none"> <li>▪ Conventional Immunological and Biological products</li> <li>▪ Biopharmaceuticals / Biologics/ or biotech drugs</li> </ul> </li> <li>○ The different classes of immunological and biological products:</li> <li>○ Immunological products                   <ul style="list-style-type: none"> <li>▪ Vaccines (definition, ideal properties, types, adjuvant and delivery systemsprophylaxis application, handling (including transportation), storage and administration)</li> </ul> </li> </ul> </li> </ul>

6-7	4	<ul style="list-style-type: none"> <li>• Immunological products and biological products (Continued...) <ul style="list-style-type: none"> <li>○ Vaccines (definition, ideal properties, types, adjuvant and delivery systems prophylaxis application, handling (including transportation), storage and administration) (Continued...)</li> <li>○ Antibodies (polyclonal vs monoclonal antibodies (MAbs), hybridoma technology, mouse MAbs, humanized MAbs, MAb- drug conjugates, application of MAbs (therapeutic, prophylactic, diagnostic, targeted drug delivery, affinity chromatography)</li> </ul> </li> </ul>
8-9	4	<ul style="list-style-type: none"> <li>• Immunological products and biological products (Continued...) <ul style="list-style-type: none"> <li>○ Antibodies (polyclonal vs monoclonal antibodies (MAbs), hybridoma technology, mouse MAbs, humanized MAbs, MAb- drug conjugates, application of MAbs (therapeutic, prophylactic, diagnostic, targeted drug delivery, affinity chromatography) (Continued...)</li> </ul> </li> <li>• Biological products <ul style="list-style-type: none"> <li>○ Cytokines (Interleukins, Interferones, Tumor necrosis factors, Hematopoietic growth factors)</li> </ul> </li> </ul>
10-11	4	<ul style="list-style-type: none"> <li>• Immunological products and biological products (Continued...)</li> <li>• Biological products (Continued...) <ul style="list-style-type: none"> <li>○ Cytokines (Interleukins, Interferones, Tumor necrosis factors, Hematopoietic growth factors) (Continued...)</li> <li>○ Other growth factors</li> <li>○ Recombinant hormones</li> </ul> </li> </ul>
10-11		<ul style="list-style-type: none"> <li>• Test I</li> </ul>
12-13	4	<ul style="list-style-type: none"> <li>• Immunological products and biological products (Continued...)</li> <li>• Biological products (Continued...) <ul style="list-style-type: none"> <li>○ Recombinant blood products (clotting factors, thrombolytic agents, anticoagulating agents)</li> <li>○ Therapeutic enzymes</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>○ Nucleic acid based biological products</li> </ul>
14-15	4	<ul style="list-style-type: none"> <li>• Immunological products and biological products (Continued...)</li> <li>• Biological products (Continued...) <ul style="list-style-type: none"> <li>○ Nucleic acid based biological products (Continued...)</li> <li>○ Gene based products (gene therapy, gene delivery systems)</li> <li>○ Antisense based products (antisense oligonucleotides, siRNAs, microRNAs, aptamers, peptide nucleic acids, ribozymes)</li> </ul> </li> </ul>
16	4	<ul style="list-style-type: none"> <li>• Immunological products and biological products (Continued...)</li> <li>• Biological products (Continued...) <ul style="list-style-type: none"> <li>○ Introduction to cell based therapy (stem cell therapy, transplant rejection and cell encapsulation technology)</li> <li>○ Production, Formulation &amp; Manufacturing, Handling and Dispensing of rDNA derived drugs (Biotech drugs)</li> </ul> </li> </ul>
16		<ul style="list-style-type: none"> <li>• Test II</li> </ul>
		<b>FINAL EXAM</b>

## Module 14: Social and Administrative Pharmacy Module I

**Module Name:** Social and administrative pharmacy I

**Module Category:** Core

**Module Code:** Phar-M3181

**Module Number:** 18

**Module Weight:** 5 ECTS

**Courses:**

Course name	Course code	ECTS
Health service management and policies	Comh 3181	5

### Module description:

The social and administrative pharmacy module is designed for undergraduate pharmacy students aiming at cultivating their ability to apply socio-behavioural, health economics and supply chain management disciplines in various pharmacy practice settings starting from interactions with patients and other professionals to health systems-level decision making.

### Module objective:

After completion of this module students will be able to:

- Explain the basic concepts in public health services management
- Explain the health care delivery system in Ethiopia

### Module competencies:

Upon a successful completion of this module, students will be able to

- Render pharmaceutical services in the context of the Ethiopian health care system and national drug policy
- Actively participate in managing the supply of medical supplies, equipment and reagents
- Effectively communicate with other health professionals to promote and market pharmaceuticals
- Demonstrate management skills to lead a health care program

**Mode of delivery (Parallel/Block):** Block

- Totally required hours for the module:  $5 \times 27 =$  135hrs

**Module teaching/learning method:**

- Lecture
- Active learning methods (brain storming, buzz group, discussion, group and individual presentation, assignment etc),

**Module mode of assessment:**

The assessment criteria are based on continuous assessment of class activities, individual and group assignment, report writing, test and final exams. This in turn can be broken down into;

- Quizzes: 15%
- Assignment: 15%
- Tests-15% %
- Seminar presentations:10%
- Project work: 15%
- Final written exam-30%



## Course syllabus

### Health Service Management and Policies

**Course title:** Health Service Management and Policies

**Course code:** Com-H 3181

**Course ECTS credits:** 5 ECTS

**Module Number:** 18

**Course pre-requisite if any:** None

**Status of the course (compulsory/supportive/common/elective course):** supportive

**Course description:** This course is designed to give the student a basic concept of public health services management. It begins by introducing the trainee to the lay and professional concept of health. It then goes on to deal with factors affecting health. It will also give students the knowledge about the relationship of health and development, health systems, Primary health care and health for all, definition and applicability to public health of subjects taught under public health, identifying community health problems, indicators of health status of a population, and major strategies of improving public health in developing countries

#### **Specific course learning objectives:**

Upon completion of this course, the student will be able to:

- Describe basic principles , concepts and methods in health management
- Demonstrate management skills so as to plan ,implement & evaluate effectively & efficiently PHC programs
- Identify planning decisions relating to objectives ,activities & resources
- List & relate functions of management dealing with the execution of activities, and the use of human and physical resources.
- Evaluate the different programs and components of services.
- Apply the basic principles involved in management of resources including drugs
- Establish and manage a working health tam
- Describe the organization and administration of health services in Ethiopia to correlate planning and management to the existing situation
- Describe what PHC is, its component and approaches so and to implement PHC activities to reach at social-health goals of the world

Schedule of contact time, contents/topics & reading/reference materials for each topic

Week	Contact hrs	Topic/sub-topic/chapter	Reading materials	Remark
1-2	4	Chapter 1: introduction to Health service management <ul style="list-style-type: none"> <li>• Rationale for the course</li> <li>• Definitions, principles and concepts of management</li> <li>• Management and environment</li> <li>• Types, skills and roles of managers</li> <li>• Main functions of management</li> </ul>	Reference: 1,1	
3-4	6	Chapter 2: Health delivery system in Ethiopia <ul style="list-style-type: none"> <li>• Organization of Ministry of health</li> <li>• National health policy</li> <li>• National health plan</li> <li>• Specific programs within the health service</li> </ul>	Reference: 1	
5 - 6	6	chapter 3: Primary health care <ul style="list-style-type: none"> <li>• Historical development</li> <li>• The PHC approach</li> <li>• PHC as part of socio-economic development</li> <li>• PHC as level of health care</li> <li>• PHC strategies</li> <li>• Essential components of PHC</li> </ul>	Reference: 1,4,5	
7-8	4	Chapter 4: Health planning <ul style="list-style-type: none"> <li>- General overview</li> <li>- Steps in planning <ul style="list-style-type: none"> <li>• situation analysis</li> <li>• identifying and selecting priority problems</li> <li>• setting objectives and targets</li> <li>• setting strategies, review obstacles and limitation</li> <li>• prepare action plan</li> </ul> </li> </ul>	Reference: 1,2,4,4.6,7	
9-11	4	Chapter 5: Implementation <ul style="list-style-type: none"> <li>• principles of organization</li> <li>• organizational structure</li> <li>• coordination</li> <li>• Monitoring and control</li> <li>• Supervision</li> </ul>	Reference: 1,2,3	

12-13	2	Chapter 6: Evaluation <ul style="list-style-type: none"> <li>• Effectiveness</li> <li>• Efficiency <ul style="list-style-type: none"> <li>○ How to evaluate work progress monitoring</li> <li>○ Appraising staff performance</li> <li>○ Evaluating use of resources</li> </ul> </li> </ul>	Reference: 1,2,4,5	
14	2	Chapter 7: Managing a health team <ul style="list-style-type: none"> <li>• what a health team means</li> <li>• how to lead a health team</li> <li>• organizing a health team</li> <li>• controlling and assessing the work</li> </ul>	Reference: 1,1	
15-16	2	Chapter 8: Managing resources	Reference: 1, 2,	

1. Delivery mode/methodology:

- Lecture
- Active learning methods (brain storming, buzz group, discussion, group and individual presentation, assignment etc),

2. Assessment mechanisms:

- Quizzes: 15%
- Assignment: 15%
- Tests-15% %
- Seminar presentations:10%
- Project work: 15%
- Final written exam-30%

3. Course policies:

- Lecture is mandatory
- Student should submit assignments on due date
- Student should take all continuous assessments as scheduled. If he/she misses quiz or assignment, no make-up will be arranged for her/him.
- Student should do his/her own work. If he/she is caught red-handed while cheating, he/she will get zero for that particular work

4. References

Text Book

1. On Being In charge - A Guide for Middle - Level Management in PHC, WHO, Geneva, 1980.1992.

#### Other References

1. Challi Jira, Amsalu Feleke, Getnet Mitike (2003) Health Science Management for Health Science Students. Lecture Note Series. Jimma University: JU.
2. MOH (1993), Health Policy of Transitional Government of Ethiopia, Addis Ababa.
3. Health and Health Related indicators, By the Federal Ministry Of Health ,
4. WHO “Health For All” series 1-7. WHO Geneva.
5. Review of PHC (National). 1985
6. Alma Ata Declaration. WHO/UNICEF, 1978.
7. 20 Year health sector plan (HSDP) and HSTP.

**Module Name: Biopharmaceutics and Clinical Pharmacokinetics Modules****Module Category:** Core**Module Code:** Phar-M3191**Module Number:** 19**Module Weight:** 7 ECTS**Course:**

S/N	Course name	Course code	ECTS
1	Biopharmaceutics and Clinical Pharmacokinetics	Phar4151	7

**Module Description**

This module deals with mechanisms of drug absorption, effect of pH on drug absorption and the pH partition principle, role of dosage forms in the absorption of drugs, bioavailability and bioequivalence, factors affecting bioavailability, and evaluation of the bioavailability of a drug. It also deals with the pharmacokinetics aspect of drug molecules i.e. how drugs are absorbed, distributed, metabolized and eliminated in the body. This is essential for pharmacists to provide patients the appropriate drug regimen that will reduce the chance of under-treatment, inadvertent poisoning, and dose related adverse effects.

**Module Objective:**

This module aims to develop the ability to logically apply the interrelationship of the physicochemical properties of the drug, the dosage form in which the drug is given and the route of administration on the rate and extent of drug absorption. It also enable to develop a graduate with good practical knowledge and understanding of pharmacokinetics and the ability to logically apply relatively simple pharmacokinetic principles in everyday clinical pharmacy practice.

**Module Competency**

After completion of this module the students will be able to use the principle of pharmacokinetics in dose adjustment, therapeutic drug monitoring and decision making with regard to rational drug use.

**Module Mode of Delivery:**

- Parallel

**Module teaching/learning methods****Learning Activities**

- Engage in learning by doing (independent study, group assignments, presentation, report, writing, and etc...)
- Participation and note takings during class lectures and debates and discussions;
- Analysis, summarization and presentations of chapter/article, scientific reports (and be able present or submit in a concise and summarized form)
- Liver and kidney function data collection, interpretation, identifying appropriate formula and accordingly adjust the dose for that patient

**Teaching Methods**

- The course facilitator is expected to lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments,

- Arrange and facilitate seminar sessions by inviting other health care professionals for public lectures.
- Inform the physician and nurse utilize the already adjusted dose and r calculated loading dose to their client.

**Module mode of Assessment**

- Group assignments
- Case study presentation
- Tests/quizzes
- Final Exam

**Course Name:** Biopharmaceutics and Clinical Pharmacokinetics

**Course code:** Phar3191

**Module Name:** Biopharmaceutics and Pharmacokinetics Module

**Module Code:** Phar-M3191

**Course ECTS:** 7

**Totally required hours for the course:** 189 hrs

**Lecture hours:** 64

**Study hours:** 100

**Group work:** 00

**Project work:** 00

**Presentation(s):** 15

**Tutorial:** 10

**Assessment:**

**Year/Semester Course is offered:** Year III Semester II

**Course prerequisite/s:** Physiology II and Pharmacology II

**Course Description:**

This module deals with mechanisms of drug absorption, effect of pH on drug absorption and the pH partition principle, role of dosage forms in the absorption of drugs, bioavailability and bioequivalence, factors affecting bioavailability, and evaluation of the bioavailability of a drug. It also deals with the pharmacokinetics aspect of drug molecules i.e. how drugs are absorbed, distributed, metabolized and eliminated in the body. This is essential for pharmacists to provide patients the appropriate drug regimen that will reduce the chance of under-treatment, inadvertent poisoning, and dose related adverse effects.

**Course Objectives:**

After completion of this course students will be able to:

- To develop the ability to logically apply the interrelationship of the physicochemical properties of the drug, the dosage form in which the drug is given and the route of administration on the rate and extent of drug absorption.
- To develop a graduate with good practical knowledge and understanding of pharmacokinetics and the ability to logically apply relatively simple pharmacokinetic principles in everyday clinical pharmacy practice.

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

- Active participation during class lectures and excursions

- Engage in learning by doing
- The course instructor is expected to introduce concepts and topics and give references, facilitate discussions, ask questions, correct assignments
- Arrange and facilitate excursions

#### **Assessment techniques:**

- Group and assignments: 10%
- Case study presentation: 10%
- Tests: 15%
- Quizzes: 15%
- Seminar presentation: 10%
- Final Exam: 40%

#### **Teachers' and students' role**

##### **Roles of Instructors**

##### **The instructor will be expected to:**

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments & case studies & presentations of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties

##### **Roles of Students**

##### **Students are expected to:**

- Engage in learning by doing (independent study, group works/exercises, etc.)
- Be active learners (participate effectively in group assignments, class activities/presentations, etc.);
- Attend classes regularly (Both theory and presentations)

#### **References:**

1. Robin L. Southwood      Virginia H. Fleming      Gary Huckaby. Concept in clinical pharmacokinetics. 7<sup>th</sup> edition, American Society of Health-System Pharmacists, 2018
2. M. E. Aulton, Pharmaceutics: the science of dosage form design, 7<sup>th</sup> ed., Churchill Livingstone, Edinburgh.



3. Shargel, L, Yu, ABC. Wu-Pong, S, Applied Biopharmaceutics and Pharmacokinetics, 7<sup>th</sup> ed. McGraw Hills, 2004
4. Washington N, Washington C, Wilson Physiological pharmaceuticals- Barriers to drug absorption, 2<sup>nd</sup> ed., Taylor & Francis, London.
5. Gibaldi, M., Biopharmaceutics and clinical Pharmacokinetics 4<sup>th</sup> ed. Lea and Febiger, Philadelphia, 1992.
6. Rowland, M. and Tozer, T.N., Clinical Pharmacokinetics, 5<sup>th</sup> ed., Lea and Febiger, New Delhi, 2019.
7. Curry, S.H., Drug Disposition and pharmacokinetics, 3<sup>rd</sup> ed., Blackwell Scientific Publications, Oxford, 1980.
8. Bauer, L A. Applied Clinical Pharmacokinetics, 2<sup>nd</sup> ed., McGraw-Hill, New York, 2008
9. Atkinson AJr, Abernethy, DR, Daniels, CE, Dedrick, RL, Markey, SP, Principles of Clinical Pharmacology, 2<sup>nd</sup> ed., London, Elsevier Inc., 2007
10. Notari; R.E. Biopharmaceutics and clinical Pharmacokinetics, 4<sup>th</sup> ed. Marcel Dekker, Inc., New York, 1987.

### Course Schedule

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments	Reading Materials	Remark
<b>Part I: Biopharmaceutics</b>				
1	4	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Definitions, concepts and applications</li> <li>• Barriers of drug transport (epithelia and plasma membrane)</li> <li>• Mechanisms of drug transport (Paracellular and transcellular routes, passive diffusion, carrier-mediated transport (Active transport, facilitated diffusion), vesicular transport)</li> </ul>		
2	4	<ul style="list-style-type: none"> <li>• Factors affecting oral drug absorption               <ul style="list-style-type: none"> <li>○ GIT anatomy and physiology</li> <li>○ Physiologic factors (blood flow, GIT motility; emptying and transit times, gastrointestinal pH, pre-systemic metabolism, Stability in the GIT, other drugs, effect of food, disease states)</li> </ul> </li> </ul>		

		<ul style="list-style-type: none"> <li>• Quiz</li> </ul>		
3	4	<ul style="list-style-type: none"> <li>• Factors affecting oral drug absorption (Continued...) <ul style="list-style-type: none"> <li>○ Physiochemical factors(Drug dissolution and Noyes-Whitney equation, particle size and surface area, crystal forms, salt formation, PKa and PH , lipid solubility, pH-partition hypothesis)</li> <li>○ Formulation factors (Drug release from Solution, suspension, capsules and tablets; effects of excipients) (3hrs)</li> </ul> </li> </ul>		
4	3	<ul style="list-style-type: none"> <li>• Factors affecting oral drug absorption (Continued...) <ul style="list-style-type: none"> <li>○ Formulation factors (Drug release from Solution, suspension, capsules and tablets; effects of excipients)</li> </ul> </li> </ul>		
4		<ul style="list-style-type: none"> <li>• Test I</li> </ul>		Chapters I&II
5	3	<ul style="list-style-type: none"> <li>• Drug absorption from other routes of administration <ul style="list-style-type: none"> <li>○ Percutaneous drug absorption ( anatomy &amp; physiology, process of absorption, factors influencing absorption)</li> <li>○ Parental drug absorption (Intramuscular, Subcutaneous, Intradermal) ( Anatomy &amp; physiology, Process of absorption, Factors influencing absorption)</li> <li>○ Rectal drug absorption (anatomy &amp; physiology, process of absorption, factors influencing absorption)</li> </ul> </li> <li>• Quiz</li> </ul>		
6	3	<ul style="list-style-type: none"> <li>• Drug absorption from other routes of administration (Continued...) <ul style="list-style-type: none"> <li>○ Vaginal drug absorption (anatomy &amp; physiology, process of absorption, factors influencing absorption)</li> <li>○ Pulmonary drug absorption (anatomy &amp; physiology, process of absorption, Factors influencing absorption)</li> </ul> </li> </ul>		

		<ul style="list-style-type: none"> <li>○ Nasal drug absorption (Anatomy &amp; physiology, process of absorption, factors influencing absorption)</li> <li>○ Ophthalmic drug absorption (Anatomy &amp; physiology, Process of absorption, Factors influencing absorption)</li> </ul>		
7	3	<ul style="list-style-type: none"> <li>• Bioavailability and Bioequivalence <ul style="list-style-type: none"> <li>○ Introduction and terminologies</li> <li>○ Types of bioavailability (absolute, relative)</li> <li>○ Methods of Assessing Bioavailability (in vivo methods, in vitro methods)</li> <li>○</li> </ul> </li> </ul>		
8	3	<ul style="list-style-type: none"> <li>• Bioavailability and Bioequivalence (Continued...) <ul style="list-style-type: none"> <li>○ In Vitro/ in Vivo Correlations and Biopharmaceutical classification Scheme</li> <li>○ Bioequivalence studies</li> </ul> </li> </ul>		
8		<ul style="list-style-type: none"> <li>• Test II</li> <li>• Assignment</li> </ul>		Chapters III&IV
<b>Part II: Clinical Pharmacokinetics</b>				
9	2	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Definitions, applications and types of pharmacokinetics <ul style="list-style-type: none"> <li>○ Pharmacokinetic and Pharmacodynamic relationships</li> </ul> </li> </ul>		
10	3	<ul style="list-style-type: none"> <li>• Basic pharmacokinetics <ul style="list-style-type: none"> <li>○ Order and rate constants</li> <li>○ Pharmacokinetic models <ul style="list-style-type: none"> <li>▪ Physiologic (perfusion models)</li> <li>▪ Model independent methods (statistical moment theory)</li> </ul> </li> </ul> </li> </ul>		
11	4	<ul style="list-style-type: none"> <li>• Basic pharmacokinetics (Continued...) <ul style="list-style-type: none"> <li>○ Non-linear pharmacokinetics</li> <li>○ Drug distribution (Tissue permeability, distribution co-efficient, binding of drugs, volume of distribution)</li> </ul> </li> </ul>		

		<ul style="list-style-type: none"> <li>• Quiz</li> </ul>		
12	4	<ul style="list-style-type: none"> <li>• Basic pharmacokinetics (Continued...) <ul style="list-style-type: none"> <li>○ Drug elimination (drug metabolism, renal and extra-renal excretion, concept of clearance)</li> <li>○ Pharmacokinetics of IV bolus injection (plasma conc. vs time profile, determination of kinetic parameters)</li> <li>○</li> </ul> </li> </ul>		
13	4	<ul style="list-style-type: none"> <li>• Basic pharmacokinetics (Continued...) <ul style="list-style-type: none"> <li>○ Pharmacokinetics of constant rate infusion (plasma conc. vs time profile, steady state, loading dose)</li> <li>○ Pharmacokinetics of IV extravascular dose (plasma conc. vs time profile, Parameters)</li> <li>○</li> </ul> </li> </ul>		
14	4	<ul style="list-style-type: none"> <li>• Basic pharmacokinetics (Continued...) <ul style="list-style-type: none"> <li>○ Dosage regimen (Introduction, multiple dosing and the therapeutic window, drug accumulation and steady state; maintenance and loading doses, designing a dosage regimen)</li> </ul> </li> </ul>		
14		<ul style="list-style-type: none"> <li>• Assignment</li> <li>• Test III</li> </ul>		Basic pharmacokinetics
15	4	<ul style="list-style-type: none"> <li>• Clinical pharmacokinetics <ul style="list-style-type: none"> <li>○ Definition and Applications</li> <li>○ Individualization and optimization of drug therapy <ul style="list-style-type: none"> <li>▪ Dosage regimen adjustment in renal impairment</li> <li>▪ Dosage regimen adjustment in hepatic impairment</li> <li>▪ Dosage regimen adjustment in Pediatrics</li> <li>▪ Dosage regimen adjustment in Geriatrics</li> <li>▪ Dosage regimen adjustment in Obesity</li> </ul> </li> </ul> </li> </ul>		

		<ul style="list-style-type: none"> <li>▪ Pharmacokinetic drug interactions in combination therapy</li> <li>▪</li> </ul>		
16	4	<ul style="list-style-type: none"> <li>• Clinical pharmacokinetics (Continued...) <ul style="list-style-type: none"> <li>○ Therapeutic drug monitoring <ul style="list-style-type: none"> <li>▪ Principles and applications</li> <li>▪ Drugs requiring therapeutic drug monitoring</li> <li>▪ Antibiotics – Aminoglycosides and vancomycin</li> <li>▪ Anticonvulsants – Phenytoin, carbamazepine, valproic acid, Phenobarbital/primidone, ethosuximide</li> <li>▪ Cardiovascular drugs – Digoxin, lidocaine, procainamide and N-acetyl procainamide and quinidine</li> <li>▪ Immunosuppressants – cyclosporine and tacrolimus</li> <li>▪ Other drugs - Lithium, theophylline</li> </ul> </li> </ul> </li> </ul>		
		<b>FINAL EXAM</b>		

**Module Name: Pharmaceutical Technology II****Module Category:** Core**Module Code:** Phar-M4201**Module Number:** 20**Module Weight:** 7 ECTS**Courses:**

S/N	Course name	Course code	ECTS
1	Industrial Pharmacy	Phar3121	7

**Module Description**

The module covers preformulation, formulation, manufacturing and packaging of oral liquids, capsules, tablets, aerosols and sterile products (parenterals & ophthalmic); equipment and instruments used for production, quality control and the overall quality assurance and current good manufacturing practices. It also covers unit operations in pharmaceutical technology.

**Module Objective**

This module aims to equip the student with theoretical and practical aspects of manufacturing of pharmaceuticals; the necessary skills required for processing dosage forms at industrial scale; and the fundamentals of quality assurance of pharmaceuticals and current good manufacturing practices.

**Module Competency**

Upon a successful completion of this module/course, students will be capable of developing formulation and manufacture various pharmaceutical dosage forms (conventional and biopharmaceutical products) and evaluate their qualities.

**Module Mode of Delivery:**

- Parallel

**Module teaching/learning methods****Learning Activities**

- Active participation during class lectures
- Engage in learning by doing
- Laboratory group work

**Teaching Methods**

- The instructor is expected to introduce concepts and topics, and give references, facilitate discussions, ask questions, correct assignments

**Module mode of Assessment****Formative and Summative assessments**

- Quizzes
- Laboratory reports

- Seminar Presentations
- Assignments
- Final exam

## **Pharmaceutical Technology Module Syllabi**

**Module Number:** 20

**Course Title:** Industrial Pharmacy

**Course Code:** Phar4201

**Course EtCTS:** 7

**Course Hours:** 189

**Prerequisite:** Integrated Physical Pharmacy and Pharmaceutics I and II

**Co-requisite:** None

**Totally required hours for the course:** 189hrs

**Lecture hours:** 64

**Study hours:** 54

**Excursion:** 18

**Practical:** 18

**Report writing:** 9

**Tutorial:** 8

**Assessment:** 18

**Year/Semester Course is offered:** Year IV Semester I

**Course prerequisite/s:** Integrated Physical Pharmacy and Pharmaceutics I&II

### **Course Description:**

This course covers the theoretical and practical considerations of pertinent unit operations in pharmacy, namely milling, mixing, drying, filtration, centrifugation, crystallization. It also addresses the manufacturing and packaging of oral liquids, capsules, conventional tablets, coated tablets, and sterile products (parenterals, ophthalmic, irrigating solutions). Equipment and machinery used for production, quality control and the overall quality assurance and good manufacturing aspects of these dosage forms are also discussed. The practical sessions include granulation and characterization, tablet pressing and assessing the qualities of the tablets.

### **Course Objectives:**

After completion of this course students will be able to:

- Perform pertinent unit operations employed in the production of dosage forms.
- Apply the theoretical and practical aspects of manufacturing of pharmaceuticals;
- Acquire the necessary skills required for processing dosage forms at industrial scale;
- Perform of quality assurance of pharmaceuticals and
- Be familiar with Current good manufacturing practices.

**Course mode of delivery:** Parallel



**Course learning and teaching methods:**

- Active participation during class lectures and excursions
- Engage in learning by doing
- The course instructor is expected to introduce concepts and topics and give references, facilitate discussions, ask questions, correct assignments
- Arrange and facilitate excursions

**Assessment techniques:**

- Tests/quizzes: 25%
- Written exam for the practical session: 15%
- Assignments (Group and/or individual): 10%
- Laboratory and excursion reports: 10%
- Written final exam: 40%

**Teachers' and students' role****Roles of Instructors****The instructor will be expected to:**

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments & exercises of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties

**Roles of Students****Students are expected to:**

- Engage in learning by doing (independent study, group works/exercises, etc.)
- Be active learners (participate effectively in group assignments, class activities/exercises, etc.);
- Should submit all group and/or individual assignments on due date
- Attend classes regularly

**References:****Required readings (Text)**

1. The Theory and Practice of Industrial Pharmacy, L. Lachman, H. A. Liberman and J. L. Kanig, 4th ed., Lea & Febiger, Philadelphia, 2015.
2. Unit Processes in Pharmacy, D. Ganderton, William Heinemann Medical Books Ltd., London, 1968.

### Recommended readings

3. Unit Operations in Chemical Engineering, W. L. McCabe and J. C. Smith, 3rd Ed., McGraw-Hill, Inc. USA, 1976.
4. M. E. Aulton, *Pharmaceutics: the science of dosage form design*, 7<sup>th</sup> ed., Churchill Livingstone, Edinburgh.
5. *Bentley's Textbook of Pharmaceutics*, Edited by E. A. Rawlins, 8th Edition, Bailliere Tindall, London, 2002.
6. L. V. Allen, N. G Popovich, H. C Ansel, *Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems*, 11<sup>th</sup> edition, Lippincott Williams & Wilkins, 2017.
7. *Modern Pharmaceutics* by Gilbert S. Banker (Editor), Christopher T. Rhodes (Editor) 4th edition, 2002, Marcel Dekker
8. *Merck Index: An Encyclopedia of Chemicals, Drugs, & Biologicals* by Merck, Co, Maryadele J. Oneil (Editor), Ann Smith (Editor) 15th edition, 2013, Merck & Co
9. *Physical Pharmacy: Physical Chemical Principles in the Pharmaceutical Sciences* by Alfred Martin, Pilar Bustamante, A.H.C. Chun (Illustrator) , 4th edition, 1993, Lea & Febiger
10. *Handbook of Pharmaceutical Excipients* by Arthur H. Kibbe (Editor), Ainley Wade, Paul J. Weller, 3rd edition Vol 3, 2000, Amer. Pharmaceutical Assoc.

### Course Schedule

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments
1	3	<ul style="list-style-type: none"> <li>• Unit operations               <ul style="list-style-type: none"> <li>○ Size reduction                   <ul style="list-style-type: none"> <li>▪ Introduction (Definition and applications)</li> <li>▪ Mechanisms of size reduction</li> <li>▪ Equipments</li> </ul> </li> <li>○ Size separation                   <ul style="list-style-type: none"> <li>▪ Introduction (definition and applications)</li> <li>▪ Size separation techniques</li> </ul> </li> </ul> </li> </ul>
2	3	<ul style="list-style-type: none"> <li>• Unit operations (Continued...)               <ul style="list-style-type: none"> <li>○ Mixing                   <ul style="list-style-type: none"> <li>▪ Introduction (definition and applications)</li> </ul> </li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>▪ Fluid/semisolid/solid mixing</li> </ul>
3	3	<ul style="list-style-type: none"> <li>• Unit operations (Continued...) <ul style="list-style-type: none"> <li>○ Drying <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Drying of wet solids, mechanisms and equipment</li> <li>▪ Dryers for dilute solution and suspension</li> <li>▪ Spray drying</li> <li>▪ Freeze drying</li> </ul> </li> </ul> </li> </ul>
4	3	<ul style="list-style-type: none"> <li>• Unit operations (Continued...) <ul style="list-style-type: none"> <li>○ Filtration and clarification <ul style="list-style-type: none"> <li>▪ Introduction (principles and applications)</li> <li>▪ Types and mechanism of filtration</li> <li>▪ Factors affecting the rate of filtration</li> <li>▪ Equipments</li> <li>▪ Centrifugation</li> </ul> </li> <li>○ Crystallization <ul style="list-style-type: none"> <li>▪ Introduction (concepts)</li> <li>▪ Crystallization techniques</li> </ul> </li> </ul> </li> </ul>
5	4	<ul style="list-style-type: none"> <li>• Tablets <ul style="list-style-type: none"> <li>○ Introduction (Rationale, quality attributes and classification)</li> <li>○ Tablet formulation (API properties, excipients)</li> <li>○ Tablet manufacturing by direct compression</li> </ul> </li> <li>• Quiz</li> </ul>
6	4	<ul style="list-style-type: none"> <li>• Tablets (Continued...) <ul style="list-style-type: none"> <li>○ Tablet manufacturing by granulation</li> <li>○ Reasons for granulation, mechanisms of granule formation, methods of granulation, granulators, characterization</li> <li>○ Tablet compression machines (types, basic parts and auxiliaries)</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>○ Stages of tablet formation</li> </ul>
7	4	<ul style="list-style-type: none"> <li>● Tablets (Continued...) <ul style="list-style-type: none"> <li>○ Problems in tableting and troubleshooting (capping and lamination, picking and sticking, mottling, chipping and friability, weight/content variation)</li> <li>○ Quality evaluation (general appearance, thickness, hardness, friability, disintegration time, dissolution, weight variation, content uniformity)</li> </ul> </li> </ul>
7		<ul style="list-style-type: none"> <li>● Test I</li> </ul>
8	3	<ul style="list-style-type: none"> <li>● Tablet Coating <ul style="list-style-type: none"> <li>○ Tablet coating principles</li> <li>○ Coating process and equipment</li> <li>○ Sugar coating and film coating</li> <li>○ Coating formula optimization</li> <li>○ Quality control</li> </ul> </li> </ul>
9	4	<ul style="list-style-type: none"> <li>● Capsules <ul style="list-style-type: none"> <li>○ Hard Gelatin Capsules <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Raw materials for empty capsules</li> <li>▪ Empty capsule manufacturing</li> <li>▪ Formulation (powder formulation, excipients, semisolid, solid, liquid)</li> <li>▪ Formulation for filling properties, formulation for release of API, formulation for position release</li> </ul> </li> </ul> </li> <li>● Quiz</li> </ul>
10	4	<ul style="list-style-type: none"> <li>● Capsules (Continued...) <ul style="list-style-type: none"> <li>○ Hard Gelatin Capsules (Continued...) <ul style="list-style-type: none"> <li>▪ Capsule Filling Machine: Filling Mechanism</li> <li>▪ Quality control of filled HGC</li> <li>▪ Storage, packaging and stability of HGC</li> </ul> </li> <li>○ Soft gelatin capsules</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>▪ Introduction (Description of the soft gel, Rationale for selection)</li> <li>▪ Capsule shell</li> <li>▪ Formulation (fill materials)</li> <li>▪ Manufacturing techniques</li> <li>▪ Quality control tests</li> </ul>
11	4	<ul style="list-style-type: none"> <li>• Liquid Dosage Forms: Solutions and Coarse dispersions <ul style="list-style-type: none"> <li>○ Solutions <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Formulation considerations (solvents and other excipients, stability)</li> <li>▪ Manufacturing processes: Equipments and machines, filling and packaging</li> <li>▪ Quality evaluations</li> </ul> </li> <li>○ Suspension and Emulsion <ul style="list-style-type: none"> <li>▪ Introduction (physical properties)</li> <li>▪ Formulation considerations, stability and preservation</li> </ul> </li> </ul> </li> </ul>
12	1	<ul style="list-style-type: none"> <li>• Liquid Dosage Forms: Solutions and Coarse dispersions (Continued...) <ul style="list-style-type: none"> <li>○ Suspension and Emulsion (Continued...) <ul style="list-style-type: none"> <li>▪ Manufacturing processes: equipments and machines, filling and packaging</li> <li>▪ Quality evaluations</li> </ul> </li> </ul> </li> </ul>
12	3	<ul style="list-style-type: none"> <li>• Sterile Products <ul style="list-style-type: none"> <li>○ Parenteral products</li> <li>○ Types of parenterals</li> <li>○ Product development, vehicles, solutes, containers</li> <li>○ Production design facilities, steps in processing, packaging</li> </ul> </li> </ul>
12		<ul style="list-style-type: none"> <li>• Test II</li> </ul>

13	3	<ul style="list-style-type: none"> <li>• Sterile Products (Continued...) <ul style="list-style-type: none"> <li>○ Production design facilities, steps in processing, packaging (Continued...)</li> <li>○ Aseptic room &amp; processing, quality control and quality assurance</li> <li>○ Ophthalmic and other sterile preparations</li> </ul> </li> </ul>
14	4	<ul style="list-style-type: none"> <li>• Pharmaceutical Aerosols <ul style="list-style-type: none"> <li>○ Physicochemical principles of aerosol science and technology</li> <li>○ Components of aerosols: propellants, containers, valve and actuator systems</li> <li>○ Types of aerosol drug delivery systems</li> </ul> </li> </ul>
15	2	<ul style="list-style-type: none"> <li>• Pharmaceutical Aerosols (Continued...) <ul style="list-style-type: none"> <li>○ Product development, manufacturing and quality control of pharmaceutical aerosols</li> <li>○ Recent developments in pharmaceutical aerosols</li> </ul> </li> </ul>
15	2	<ul style="list-style-type: none"> <li>• Modified Release Dosage Forms <ul style="list-style-type: none"> <li>○ Introduction: general mechanisms of drug release from dosage forms</li> <li>○ Types of modified release dosage forms: controlled release, sustained release, delayed release, repeated release formulation</li> </ul> </li> </ul>
16	4	<ul style="list-style-type: none"> <li>• Modified Release Dosage Forms (Continued...) <ul style="list-style-type: none"> <li>○ Design, development and characterization of modified release dosage forms</li> <li>○ In vitro/In vivo evaluation of modified release dosage forms</li> </ul> </li> </ul>
16	6	<ul style="list-style-type: none"> <li>• Current Good Manufacturing Practices <ul style="list-style-type: none"> <li>○ Building and facilities</li> <li>○ Organization and personnel</li> <li>○ Material, packaging, labeling control</li> </ul> </li> </ul>

		<ul style="list-style-type: none"><li>○ Production &amp; process controls</li><li>○ Handling &amp; distribution</li></ul>
		<ul style="list-style-type: none"><li>● Test III</li></ul>
		<b>FINAL EXAM</b>

## Module 21: Social and Administrative Pharmacy Module

**Module Name:** Social and administrative pharmacy

**Module Category:** Core

**Module Code:** Phar-M4211

**Module Number:** 21

**Module Weight:** 17 ECTS

**Courses:**

Course name	Course code	ECTS
Introduction to pharmacoeconomics	Phar 4141	5
Pharmaceutical supply chain management	Phar4142	7
Medical supplies, equipment and reagents	Phar3143	3
Pharmaceuticals promotion and marketing	Phar3144	2

### Module description:

The social and administrative pharmacy module is designed for undergraduate pharmacy students aiming at cultivating their ability to apply socio-behavioural, health economics and supply chain management disciplines in various pharmacy practice settings starting from interactions with patients and other professionals to health systems-level decision making. It helps students to be able to ensure and manage the supply chains of pharmaceuticals in cost efficient ways (drugs, medical supplies, equipment and reagents) in the various health care settings. The module also equips students with appropriate health service and pharmaceutical management skills. Moreover, it equips students with the basics of cost and outcome analysis of drug therapy. It essentially enables prospective graduate pharmacists to competently involve in pharmacoeconomic decision making of drug treatments in communication with all the relevant parties. In addition, this module introduces students to the concept of essential drugs, rational drug use and drug policy: need, development process, objectives and component strategies. The structure of the Ethiopian Health Care System and the National Drug Policy will also be dealt. It also sheds light on monitoring and evaluation of pharmaceutical programs as part of drug policy. It elaborates drug supply management cycle, namely, selection, quantification procurement, distribution, and rational use of pharmaceuticals. The module deals about effective ways of drug use information gathering to investigate drug use-related problems. And finally, the module also deals with planning, implementation and evaluation of health activities.

### Module objective:



After completion of this module students will be able to:

- Develop and apply the principles and theory of pharmacoeconomics for health care decision-making.
- Describe the concept of essential drugs, the national drug policy including the core objectives and key strategies.
- Discuss the importance of drug management in controlling costs and preventing morbidity and mortality.
- Explain the basic concepts in public health services management
- Explain the health care delivery system in Ethiopia
- Describe the different types of medical supplies, equipment and reagents and their uses
- Describe the environmental factors that affect marketing of pharmaceuticals and
- Understand and demonstrate the successful application of marketing principles in response to environmental factors.

#### **Module competencies:**

Upon a successful completion of this module, students will be able to

- Render pharmaceutical services in the context of the Ethiopian health care system and national drug policy
- Manage the development of essential drug list, standard treatment guideline and national formulary based on the essential medicines concept
- Actively participate in managing the supply of medical supplies, equipment and reagents
- Manage the selection, procurement, distribution and use of pharmaceuticals
- Effectively communicate with other health professionals to promote and market pharmaceuticals
- Appraise published pharmacoeconomics studies and effectively use them for decision making process
- Identify the type of economic evaluation most appropriate for a particular decision-making context.
- Identify the economics models appropriate for different scenarios
- Demonstrate management skills to lead a health care program

**Mode of delivery (Parallel/Block):** Parallel

- Totally required hours for the module:  $17 \times 27 = 459$ hrs

- Lecture hours: 101hrs (25%)
- Study hours: 122 hrs (30%)
- Group work: 61 hrs (15%)
- Project work: 20 hrs (5%)
- Presentation(s): 41hrs (10%)
- Tutorial: 20 hrs (5%)
- Assessment: 41hrs (10%)

**Module teaching/learning method:**

Learning Activities

Students are expected to undertake among others the following major learning activities:

- Engage in learning by doing (independent study, group assignments, presentation, report writing, etc...)
- Participation and note takings during class lectures and debates and discussions; Analysis, summarization and presentations of journals and cases studies

Teaching Methods

- The course facilitator is expected to lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments, forming groups, encouraging students for peer learning
- Arrange and facilitate seminar sessions prepared by students

**Module mode of assessment:**

The assessment criteria are based on continuous assessment of class activities, individual and group assignment, report writing, test and final exams. This in turn can be broken down into;

- Group/individual assignments: 15%
- Presentation: 10%
- Journal clubs 10%
- Tests/quizzes 15%
- Case studies 10%
- Final Exam 40%
- Total 100%

**Course Name:** Introduction to pharmacoeconomics  
**Course code:** Phar4211  
**Module Name:** Social and administrative pharmacy module II  
**Module Code:** Phar-M4211  
**Course ECTS:** 3

- Totally required hours for the course: 135hours (5ECTS x 27)
- Lecture: 48
- Project work: 14 hours
- Presentations= 14
- Tutorial: 13 hours
- Home study: 36 hours
- Assessment= 10 hours

**Year/Semester Course is offered:** Year IV Semester I

**Course prerequisite/s:** None

**Course description:**

This introductory course in pharmacoeconomics is designed to prepare pharmacists who can competently involve in pharmacoeconomic decision-making. Students will be able to describe and use different methods of pharmacoeconomic evaluation and effectively analyse and evaluate different pharmacoeconomic studies.

**Course objective:**

After completion of this course students will be able to describe the different methods of pharmacoeconomic analysis and evaluate pharmacoeconomic studies and effectively use them for decision making.

**Supporting objectives:**

To meet this objective, students will:

- Define pharmacoeconomics
- Identify measures of direct and indirect costs based on data on charges, expenditures, and treatment algorithms.

- Determine and use standard costs in economic evaluations.
- Discount costs and benefits appropriately.
- Describe pharmacoeconomics analytical models
- Discuss the importance of specification/selection of perspectives to be included in the analysis.
- Identify the strengths and weaknesses of different evaluation designs(cost-effectiveness/cost-utility/cost benefit/cost minimization).
- Identify measures of outcomes and understand the appropriate use of HRQOL, QALY, and utility measures.
- Discuss the difference between efficacy and effectiveness data.
- Discuss the implications of choice of endpoints for the analysis, including the use of (a) intermediate outcomes measures, (b) utilities and quality of life measures, (c) projected final outcomes based on trial data, and (d) summary of findings by meta-analysis.
- Understand sensitivity analysis, including choice of variables and one- and two-way analysis.
- Critique current Pharmacoeconomics literature.
- Describe the rationale and importance of pharmacoeconomic (PE) analyses.
- Describe the importance of Model in Pharmacoeconomics
- Identify the types of Decision Models Used in Economic Evaluation
- Discuss the advantages and disadvantages of Decision Trees
- Determine the advantages of Markov models and its application in Pharmacoeconomics

**Course mode of delivery:** Parallel

This course is thought using a variety of instructional methods including

- Illustrated Lectures and case studies
- Active learning methods (brain storming, buzz group, discussion, etc)
- Individual and group exercises and assignments
- Presentations and participation in class discussion

**Assessment techniques:**

Continuous assessment & summative assessment

- Quizzes: 15%
- Test: 15%

- Journal club presentation: 10%
- Case studies: 10%
- Assignments (group or individual): 15%
- Written final exam: 35%

## **Teachers' and students' role**

### **Roles of Instructors**

The instructor is expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties;

### **Roles of Students**

Students are expected to:

- Engage in learning by doing (independent study, project work; group work, etc.)
- Be active learners (participate effectively in group assignments, make presentations, prepare and present seminars, write reports, etc.);
- Critically assess journal articles and related topics from book chapters.

## **References:**

### **Required readings (Text)**

1. Drummond MF, Bernie O, Stoddard GL, Torrance GW (2005). *Methods for the Economic Evaluation of Health Care Programs*, 3<sup>rd</sup> ed. or latter edition, Oxford University Press Inc, New York.

### **Recommended readings**

2. Bootman JL, Townsend RJ, McGhan WF (2002). *Principles of Pharmacoeconomics*, 2nd ed. or later edition, Harvey Whitney Books Company, United States of America.
3. Haddix AC, Teutsch SM, Shaffer PA, Dunet DO (1996 or later edition). *Prevention Effectiveness: A Guide to Decision Analysis and Economic Evaluation*, Oxford University Press Inc, New York.

4. Online Lecture Notes – the Economics of Health Care:  
<http://www.oheschools.org/> produced by the UK Office of Health Economics.
5. Renee JG. Pharmacoeconomics from theory to practice drug discovery (2010).  
 CRC Press Taylor & Francis Group 6000 Broken Sound Parkway NW, Suite 300  
 Boca Raton, FL 33487-2742
6. Ceri J Phillips. Health economics an introduction for health professionals (2010).  
 Published by Blackwell Publishing Ltd
7. Andrew M. Jones, Nigel Rice, Teresa Bago d’Uva and Silvia Balia (2007).  
 Applied health economics. Routledge 2 Park Square, Milton Park, Abingdon OX  
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### Course schedule\*

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments	Reading Materials
1	3	Applications of economic principles in health care and pharmacy <ul style="list-style-type: none"> <li>• Health Care and Market Failure</li> </ul>	References 1,2,7
1	3	1. Introduction to Pharmacoeconomics 1.1 Definition and Importance of Pharmacoeconomic studies	Reference 2,3 & 4
2	3	2. Decision Analysis and Pharmacoeconomic Evaluations 3.1. Basic Concepts of Probability Definition and Theoretical Basis of Decision Analysis in Health	Reference 2,3 & 4
2	3	3.3 The Basic Steps of Decision Analysis Evaluation of the Result of Decision Analysis	Reference 2,3 & 4
2	3	3.4 Possible Benefits and Common Criticisms of Decision Analysis in Health	Reference 2,3 & 4
3	3	4. Costs and Time Preference. 4.1. Types of Intervention Cost Studies Collection and Types of Costs	Reference 2,3 & 4
4	3	4.3 Discounting of Costs Adjusting for Inflation and Annuitizing Capital Expenditures	Reference 2,3 & 4
5	3	5. Cost Benefit Analysis (6hrs) 5.1. Introduction to CBA 5.2. Steps in Conducting CBA	Reference 2,3 & 4
6	3	5.3 Group discussions and Exercises about CBA	Reference 2,3 & 4
7	3	6. Cost Effectiveness Analysis 6.1 Introduction to CEA	Reference 2,3 & 4
8	3	6.2 Principles of CEA 6.3 Conducting CEA	Reference 2,3 & 4

9	3	6.4 Group Discussions and Exercises about CEA	Reference 2,3 & 4
10	3	7. Cost Utility Analysis 7.1. Introduction to CUA	Reference 2,3 & 4
11	3	7.2. QALY and DALY 7.3 Measuring QALY and DALY	Reference 2,3 & 4
12	3	7.4 Conducting Cost Utility Analysis	
13	3	8. Miscellaneous Topics 8.1. Markov Models of Chronic Conditions	Reference 2,3 & 4
14	3	8.2. Screening and Pharmacoeconomics	Reference 2,3 & 4w
15	3	8.3. Assessing Articles and Critique of Pharmacoeconomic Evaluation	
16	3	8.3. Assessing Articles and Critique of Pharmacoeconomic Evaluation	
<b>FINAL EXAM</b>			

**Course Name:** Pharmaceutical Supply Chain Management  
**Course code:** Phar4212  
**Module Name:** Social and administrative pharmacy module II  
**Module Code:** Phar-M4211  
**Course ECTS:** 7 ECTS

**Totally required hours for the module: 189 hours**

**Lecture=** 4hrs

**Practical=** 16hrs

**Assignment=** 25hrs

**Presentations=** 24hrs

**Tutorial=** 13hrs

**Home study=** 36hrs

**Hospital pharmacy visit=** 10hrs

**PFSA visit=** 15hrs

**Assessment=** 10hrs

**Year/Semester Course is offered:** Year IV Semester I

**Course prerequisite/s:** Health Service Management and Policies (Com-H3141)

**Course description:**

The drug supply management course introduces students with the concept of drug policy, and its objectives, and strategies to ensure access to medicine and other health commodities to the end user (patient) at an affordable price. It also gives an insight on how the drug supply management cycle, namely, selection, quantification, procurement, distribution, and rational use, function. Moreover, the students will have a site visit in hospital and PFSA to have exposure how pharmaceutical supply chain operation looks on the ground.

**Course objective:**

After completion of this course students will be able to:

- Source, store and distribute the right medicines and other health commodities to the end user (patient) in the right place at the right time and affordable price.
- Use the appropriate tools to investigate appropriateness of medicine use;
- Assess the performance of the supply chain and take the appropriate corrective measures to ensure continuous improvement.

**Supporting objectives:**

To meet this objective, students will:

- Explain what national drug policy is and why countries need to have a drug policy.
- Describe the principles of drug supply management system including selection, quantification procurement, distribution and usage at health facility or national level.
- Adopt methods of community drug needs assessment and drug use evaluation.
- Adopt good storage practice and standard operating procedures for drug management at health facilities.
- Prepare list of essential drugs and supplies at health facilities or national level.
- Perform estimation (forecasting) of the quantities of drugs and supplies needed.
- Fill records and generate various reports to the appropriate persons and/or organizations.



- Demonstrate how to dispose expired and other unfit-for-use products based on national guideline
- Identify challenges for drug supply management.
- Explain drug selection, its rationale, and criteria for drug selection.
- Describe drug storage and stock management, stock rotation medical stock security and importance of stock management.
- Describe rational drug use: promotion of rational prescribing, dispensing and use by patients.
- Manage, monitor and evaluate the performance of the supply chain in sourcing, stocking and delivering medicines, medical equipment, medical supplies and other health commodities.
- Assume responsibility and accountability for wastage (damage or expiry) of medicines or supplies resulting from negligence.

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

This course is thought using a variety of instructional methods including

- Illustrated Lectures and case studies
- Active learning methods (brain storming, buzz group, discussion, etc)
- Individual and group exercises and assignments
- Presentations and participation in class discussion
- Hospital and PFSA visit

**Assessment techniques:**

- Assignments: 15%
- Practical reports 10%
- Quizzes: 15%
- Test: 20%
- Final exam: 40%

**Teachers' and students' role**

**Roles of Instructors**

The instructor will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and provide feedback to students' assignment submissions on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties;

**Roles of Students**

Students are expected to:

- Have a minimum of 85% class attendance
- Read all reading assignments in advance
- Submit all group and/or individual assignments on due date
- Take all continuous assessments as scheduled.

## References:

### Required readings (Text)

1. Supply MD. MDS-3: Managing Access to Medicines and Health Technologies. Arlington, VA: Management Sciences for Health. 2012.
2. Ministry of Health of Ethiopia (1997). The National Drug Policy of the transitional government of Ethiopia, Addis Ababa, Ethiopia.
3. Prashant Yadav (2015) Health Product Supply Chains in Developing Countries: Diagnosis of the Root Causes of Underperformance and an Agenda for Reform, *Health Systems & Reform*, 1:2, 142-154, DOI: 10.4161/23288604.2014.968005
4. Chopra S, Meindl P, Kalra DV. Supply chain management: strategy, planning, and operation. Boston, MA: Pearson; 2013 Nov.

### Recommended readings

5. Holloway K. (ed.) and Terry Green (2003). Drug and Therapeutics Committees. WHO/MSH.
6. WHO (2001). How to develop and implement a national drug policy. Second edition. Geneva, Switzerland.
7. Smith, H.A. (2003). Principles and Methods of Pharmacy Management, 2nd ed. Lea & Febiger, Philadelphia, 1980.
8. Hardon A., Hodgkin C., and Fresle D. (2004). How to investigate the use of medicines by consumers, WHO/University of Amsterdam/Royal Tropical Institute.
9. WHO (1997). The use of Essential Drugs: Seventh Report of the WHO Expert Committee (including the revised Model List of Essential Drugs), TRS 867, WHO, Geneva, Switzerland.
10. WHO (1988). Estimating Drug Requirements, a practical Manual, WHO/DAP/88.2
11. WHO (1994). Indicators for Monitoring National Drug policies, a Practical Manual, WHO/DAP/94.12, WHO Geneva, Switzerland.
12. WHO (1990) Management of Drugs at Health Facilities, WHO/DAP/90.10 WHO, Geneva, Switzerland.
13. WHO (1997). Public-private Roles in the Pharmaceutical sector. Implications for equitable Access and Rational Drug use. Health Economics and Drugs, DAP series N. 5, WHO/DAP/97.12, WHO, Geneva, Switzerland.
14. Kermit D. Larsen: Fundamental Accounting Principles: 12th ed.; Richard Irwin Inc., 1990.
15. Hermanson, Edwards and Salmon son: Accounting Principles, 4th-7th ed. Richard D. Irwin Inc.1989.
16. Needles, Belverd E. Jr., Henry R. Anderson, James C. Caldwell, and Sherry K. Mills. Principles of Accounting. Houghton Mifflin Company.
17. International Pharmaceutical Federation. Pharmacists in the supply chain: The role of the medicines expert in ensuring quality and availability. The Hague, the Netherlands:

- International Pharmaceutical Federation, 2017 Min H. Healthcare supply chain management: basic concepts and principles. Business Expert Press; 2014 Sep 30.
18. McCabe A, Seiter A, Diack A, Herbst CH, Dutta S, Saleh K. Private sector pharmaceutical supply and distribution channels in Africa: a focus on Ghana, Malawi and Mali.

### Course schedule\*

Week	Contact Hours Theory/ Practice	Topic/sub-topic/chapter/Assessments/Assignments
1 and 2	4/ 3	1. Introduction 1.1. Introduction to National Drug Policy 1.2. Development and implementation of National Drug Policy 1.3. Objectives and key strategies of NDP 1.4. Concept of essential medicine 1.5. Formulary process 1.6. Pharmaceutical Sector Transformation Plan of Ethiopia
3	2/ 3	2. Health commodity security 2.1. What is health commodity security? 2.2. Strategic pathway to health commodity security 2.3. Steps involved in health commodity security 2.4. The purpose of logistics system 2.5. Major activities of the logistics system 2.6. Components of a logistics cycle 2.7. Key logistics terms
4 and 5	3	3. Essentials of Healthcare Supply Chain Management 3.1. What Is Supply Chain and Supply Chain Management? 3.2. Key Supply Chain Terminology and Concepts (value, push strategy, pull strategy, postponement strategy, bullwhip effect, strategic alliance, core competency, 3.3. Developing Healthcare Supply Chain Maps 3.4. Globalization and supply chains 3.5. The importance and integrity of the supply chain to global health (universal health coverage; sustainable development goal; medicines availability, access and shortage; substandard and falsified medicines and supply chain security
6	2/ 2	4. Selection of pharmaceuticals 4.1 Introduction to selection of pharmaceuticals 4.2. Selection criteria 4.3. Approach to developing medicine list 4.4. Contribution of supply chain personnel in selection 4.5. Exercise
7 - 8	10/ 6	5. Quantification 5.1 Introduction to quantification, forecasting and supply planning 5.2 Importance of quantification in supply chain management 5.3 Key steps in quantification 5.4 Process for initiating, reviewing and updating quantification 5.5 Exercise
9	4/ 6	6. Procurement of pharmaceuticals 6.1 Procurement 6.2 Procurement process and Management 6.3 Common procurement challenges. 6.4 Procurement rules and regulations in Ethiopia 6.5 Exercise
10	6/ 3	7. Inventory management 7.1 Introduction to and key terms of inventory management 7.2 Purpose and guideline of good storage practice

		<p>7.3 Storage System</p> <p>7.4 Steps in storing pharmaceuticals</p> <p>7.5 Designing pharmaceutical store</p> <p>7.6 Pharmaceutical Disposal</p> <p>7.7 Good distribution practice and its purpose</p> <p>7.8 Designing/Redesigning distribution system</p> <p>7.8.1 Transportation Management</p>
11	6/ 6	<p>8. Inventory control system</p> <p>8.1 Introduction to and Key terms of an inventory control system</p> <p>8.2 Types of inventory control system and determining order quantities using the three versions of inventory control system</p> <p>8.3 Setting minimum and maximum levels and emergency order point</p> <p>8.4 Comparison of the three versions of inventory control systems</p> <p>8.5 Inventory control system in Ethiopia</p>
12 - 13	8/ 4	<p>9 Logistics management information system</p> <p>9.1 Logistics Management Information Systems</p> <p>9.2 Essential Data for Decision Making</p> <p>9.3 Logistics Records</p> <p>9.4 Reporting Systems and Summary Reports</p> <p>9.5 Feedback Reports</p> <p>9.6 Ethiopian logistics management information system–the integrated pharmaceutical logistics system.</p> <p>9.6.1 Auditable Pharmaceutical Transaction</p>
14	2/ 3	<p>10. Stock status assessment</p> <p>10.1 Assessing stock status</p> <p>10.2 When to assess stock status</p> <p>10.3 How to assess stock status at any level in the system</p>
14	3/ 3	<p>11. Managing for rational use medicines</p> <p>11.1 The medicine use process</p> <p>11.2 Rational use of medicines</p> <p>11.3 Irrational use of medicines and examples</p> <p>11.4 Causes of irrational use of medicines</p> <p>11.5 Impacts of irrational medicine use</p> <p>11.6 Strategies to promote rational use of medicines</p>
15 - 16	5/ 6	<p>12. Monitoring and evaluation</p> <p>12.1 Introduction to Monitoring and Evaluation</p> <p>12.2 Tools to investigate supply chain practice and performance</p> <p>12.3 Tools to investigate medicine use practice and performance</p> <p>12.4 Data collection methods</p>
13		<b>FINAL EXAM</b>

**Course title: Medical Supplies, Equipment & Reagents**

**Module category: Core**

**Module Code: Phar-M4211**

**Course code: Phar 4213**

**Course ECTS: 3**

**ECTS credits: 81 hours**

- Lecture:32
- Practical: 18 hours
- Presentations=5 hours
- Tutorial: 10 hours
- Home study: 8 hours
- Assessment=8

Pre-requisite if any: - None

***Course Description:***

- This introductory course is designed to prepare graduate pharmacists who can competently involve in managing the supply of medical supplies, equipment and reagents. Students will be able to differentiate between the different classes of medical supplies and equipment. This course also introduces students with the basic types of diagnostic drugs and reagents. This in turn helps the trainees for ease selection, quantification and procurement of different classes of medical supplies, equipments and reagents which are required by the health establishment or academic institution they shall join.

***Course objectives:***

After completion of this course students will be able to:

- Identify the different types of Medical Supplies and Equipments commonly used at different settings
- Describe how these Medical Supplies and Equipments function and used.
- Explain how these Medical Supplies and Equipments should be handled, transported and stored safely.
- Identify the different types of Diagnostic Supplies and Reagents
- Describe how these Diagnostic Supplies and Reagents are clinically applied or used.
- Identify the common Medical Supplies and Equipments used in Veterinary Medicine.

<b>Week</b>	<b>Contact hrs</b>	<b>Topic/sub-topic/chapter</b>	<b>Reading materials</b>
1	4	1. Medical Supplies and Equipment (10hr 1.1. Definition of Terms (Medical Supplies, Medical Equipment or Instrument, Reagents)	Reference 1&2
1	4	1.2.Surgical Dressings (Fibres, Fabrics, Bandages, Self-adhesive plasters, Compound dressings etc.)	Reference 1&2
2	4	1.3 Sutures and Ligatures (absorbable sutures, non-absorbable sutures, surgical needles etc.)	Reference 1&2
2	4	1.4 Medicinal Gases (classifications, uses & applications, Safety precaution, and different components, etc.	Reference 1&2
3	4	1.5 Other Medical Supplies (Needles and syringes, Gloves, Masks, Surgical blades, Scissors, Forceps, Catheter, Nasogastric tubes, Endotracheal tubes, rectal tubes).	Reference 1&2
3	4	1.6 Equipments Used in Surgery, Anesthesia, Orthopedics, Ophthalmology, Dentistry, ENT.	Reference 1&2
4	4	1.6 Equipments Used in Surgery, Anesthesia, Orthopedics, Ophthalmology, Dentistry, ENT.....	Reference 1&2
4	4	1.7 Infection Control, Sterilization and Care of Surgical Instruments	Reference 1&2
5	4	2. Diagnostic Supplies and Reagents (4hrs)	Reference 1&2
5	4	2.1.Different Diagnostic Supplies (laryngoscope, otoscope, thermometers, sphygmomanometers, glucometers, X-ray supplies, microscope, stethoscope, etc.	Reference 1&2
6	4	2.1.Diagnostic Imaging Drugs (X-ray contrast agents, Magnetic resonance contrast agents, Ultrasound contrast agents, etc.)	Reference 1&2

6	4	2.1 Non-Imaging In-Vivo Diagnostic Drugs (Cardiovascular System, Endocrine System, GIT, Lymphatic System, Reproductive System, Ophthalmic, Urinary Tract, Miscellaneous Skin Antigen Tests, etc.)	Reference 1&2
7	4	2.1.Reagents Used in the Medical Laboratory (mycobacterium testing (AFB), pregnancy tests, enteric fever tests, uric acid tests, blood grouping tests, VDRL tests, HIV tests, clinical chemistry test, etc.	Reference 1&2
7	4	2.2.Self-Care Diagnostic Devices	Reference 1&2
8	4	3. Medical Supplies and Equipments used in Veterinary Medicine (2hrs) 3.1. Peculiar characteristics of Supplies Used in Veterinary Medicine	Reference 3
8	4	3.2.Equipments Used for Oral Administration of Drugs 3.3.Equipments Used for Intravenous Administration 3.4. Materials Used for Administration of Topical Medication	Reference 3

**Mode of delivery: Block**

This course is thought using a variety of instructional methods including

- Illustrated Lectures
- Active learning methods (brain storming, buzz group, discussion, etc)
- Individual and group exercises and assignments
- Presentations and participation in class discussion
- Demonstration and visit

**Assessment mechanisms**

Continuous assessment & summative assessment

- Assignments: 10%
- Quizzes: 10%
- Presentations: 10%
- Test: 15%
- Visits and report: 15%

- Final exam: 40%

References:

1. Troy BD (ed) (2006). Remington: The Science and Practice of Pharmacy, 21<sup>st</sup> ed, Lippincott Williams and Wilkins, Philadelphia
2. Kapur MM (2005). A Complete Hospital Manual of Instruments and Procedures, Jaypee Brothers Medical Publishers Ltd, New Delhi
3. Wanamaker BP, Pettes CL (2000). Applied Pharmacology for the Veterinary Technician, 2<sup>nd</sup> ed., W.B. Saunders Company, USA.



**Course Name:** Pharmaceutical Marketing and promotion  
**Course code:** Phar 4214  
**Module Name:** Social and administrative pharmacy module  
**Module Code:** Phar-M4211  
**Course ECTS:** 3

**Totally required hours for the module: 81 hrs**

**Lecture hours:**

**Study hours:**

**Group work:**

**Project work:**

**Presentation(s):**

**Tutorial:**

**Assessment:**

**Year/Semester Course is offered:** Year IV Semester II

**Course prerequisite/s:** None

**Course description:**

This course will discuss on pharmaceutical marketing principles, environment and practice. The pharmaceutical marketing area will be covered from its history and development through the vast array of environmental forces and to the marketing mixes, known as the 4Ps. The 4Ps, considered as vital elements of pharmaceutical marketing include product development, pricing, place and promotion strategies. Due emphasis will be made to the promotion practice to reflect local contexts. Case studies will be used to illustrate the concepts.

**Course objective:**

After completion of this course students will be able to

- Apply the principles and concepts of pharmaceutical marketing in the pharmaceutical service delivery
- Integrate pharmaceutical marketing practice with the professional ethics as per the Ethiopian national guidelines
- Apply effective communication skill in the pharmaceutical service delivery
- Employ integrated pharmaceutical distribution networking and inventory management skills

**Course mode of delivery:** Block

### **Course learning and teaching methods**

- Interactive presentation and discussion
- Group discussions and presentation
- Individual and group exercises
- Role play and case study

### **Assessment techniques:**

Continuous assessment & summative assessment

- Assignments: 10%
- Quizzes: 10%
- Presentations: 10%
- Test: 15%
- Visits and report: 15%

### **Teachers' and students' role**

#### **Roles of Instructors**

The instructor is expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties;

#### **Roles of Students**

Students are expected to:

- Engage in learning by doing (independent study, project work; group work, etc.)
- Be active learners (participate effectively in group assignments, make presentations, prepare and present seminars, write reports, etc.);

### **References:**

1. Mickey C. Smith, E. M. Mick Kolassa, Greg Perkins, Bruce Siecker (Eds).  
Pharmaceutical Marketing: Principles, Environment and Practice. Informa  
Healthcare, New York, 2002.
2. Mickey C. Smith. Pharmaceutical Marketing: Strategy and Cases 1st Edition.  
CRC Press, 1991.
3. Lidstone J. Marketing Planning for the Pharmaceutical Industry 2nd Edition.  
Routledge publisher 1999.
4. Dimitri sDogramatzis. Pharmaceutical Marketing: A Practical Guide. Taylor and  
Francis, Boca Raton, 2002.
5. Philip Kotler, Joel Shalowitz, Robert J. Stevens. Strategic Marketing for Health  
Care Organizations: Building a Customer-Driven Health System. Jossey-Bass,  
San Francisco, 2008.
6. Remington’s Pharmaceutical Science, 21st ed., Lippincott Williams & Wilkins,  
Pennsylvania, 2006.

**Course schedule\***

<b>Week</b>	<b>Contact Hours</b>	<b>Topic/sub-topic/chapter/Assessments/Assignments</b>
1		<b>1. Introduction to Principles of Marketing</b> <b>1.1. Marketing</b> 1.1.1. Introduction 1.1.2. Definition 1.1.3. Marketing Concept 1.1.4. Marketing Versus selling 1.1.5. Evolution/philosophies of Marketing 1.1.6. Functions of Marketing 1.1.7. Market Research 1.1.8. Marketing strategies
2		<b>2. Pharmaceutical Marketing</b> <b>2.1. Introduction</b> <b>2.2. Definition</b> <b>2.3. Purposes</b> <b>2.4. Pharmaceutical Marketing Environment</b> 2.4.1. The internal Environment 2.4.1.1. Patients and Customers 2.4.1.2. Marketing Mixes (The Four Ps) 2.4.1.3. Analysis of the Internal Environment 2.4.2. The external Environment 2.4.2.1. The micro environment 2.4.2.1.1. The Competitive Environment 2.4.2.1.2. Porter’s Five-Factor Analysis

		<p>2.4.2.2. The macro environment (PESTLE)</p> <p>2.4.2.2.1. Political Environment</p> <p>2.4.2.2.2. Economic Environment</p> <p>2.4.2.2.3. Social Environment</p> <p>2.4.2.2.4. Technological Environment</p> <p>2.4.2.2.5. Ethical Environment</p> <p>2.4.2.2.6. Legal Environment</p> <p>2.4.2.2.7. Environmental</p> <p>2.4.2.2.8. Health care environment</p>
3		<p><b>2.5. Market situational analysis</b></p> <p>2.5.1. SWOT analysis</p> <p>2.5.2. PESTEL analysis</p> <p>2.5.3. Market feasibility study</p>
4		<p><b>2.6. Pharmaceutical marketing mix (4Ps)</b></p> <p><b>2.6.1. Product</b></p> <p>2.6.1.1. New Product Strategy</p> <p>2.6.1.2. Product Positioning Strategy</p> <p>2.6.1.3. Product Repositioning Strategy</p> <p>2.6.1.4. Product Elimination Strategy</p> <p>2.6.1.5. Diversification Strategy</p> <p>2.6.1.6. Product Life Cycle</p>
5		<p><b>2.6.2. Price</b></p> <p>2.6.2.1. Elements of price</p> <p>2.6.2.2. Determinants of pricing</p> <p>2.6.2.3. Pricing Approaches</p> <p>2.6.2.4. Pricing Decision</p> <p>2.6.2.5. Pharmaceutical financing</p> <p>2.6.2.6. The Reimbursement Environment</p>
6		<p><b>2.6.3. Place</b></p> <p>2.6.3.1. Overview of pharmaceutical distribution</p> <p>2.6.3.2. Distribution strategy</p> <p>2.6.3.3. Challenges of managing place</p> <p>2.6.3.4. Place Factors</p> <p>2.6.3.5. Key distribution channel decisions</p> <p>Inventory Management</p>
7		<p><b>2.6.4. Promotion</b></p> <p>2.6.4.1. Introduction to promotion</p> <p>2.6.4.1.1. Objectives</p> <p>2.6.4.1.2. Environmental Factors</p> <p>2.6.4.1.3. Characteristics of pharmaceutical promotion</p> <p>2.6.4.2. Targets of Promotion</p> <p>2.6.4.3. Promotional appeals</p> <p>2.6.4.4. Sources of promotional information</p> <p>2.6.4.5. Promotional mix</p> <p>2.6.4.5.1. Personal selling</p> <p>2.6.4.5.2. Advertising</p> <p>2.6.4.5.3. Public relation</p> <p>2.6.4.5.4. Sales promotion</p>

		<p>2.6.4.5.5. Internet</p> <p>2.6.4.6. Life cycle consideration</p> <p>2.6.4.7. Promotional Planning</p> <p>Promotional budget</p>
8		<p><b>3. Effective Pharmaceutical marketing communication</b></p> <p><b>3.1.</b> Introduction to effective communication</p> <p><b>3.2.</b> Communication channels</p> <p><b>3.3.</b> Factors affecting effective communication</p> <p><b>3.4.</b> Pharmaceutical marketing Communication process</p> <p><b>3.5.</b> Integration of marketing communication with the marketing mix</p> <p>Digital: Media, Pharmaceutical Marketing opportunities and Challenges</p>
9		<p><b>4. Ethical pharmaceutical marketing and promotion practice</b></p> <p><b>4.1.</b> Overview of ethical pharmaceutical marketing</p> <p>4.1.1. Ethics in pharmaceutical marketing</p> <p>4.1.2. Current ethical challenges in pharmaceutical marketing</p> <p><b>4.2.</b> Applying compassionate, respectful and caring (CRC) approach to the pharmaceutical service</p> <p><b>4.3.</b> International and national guidelines on ethical pharmaceutical marketing</p> <p>4.3.1. Ethiopian Pharmaceutical promotion guideline</p> <p>4.3.2. Code of ethics for pharmacists practicing in Ethiopia</p> <p>4.3.3. WHO pharmaceutical promotion guide</p>
10		<b>FINAL EXAM</b>

## **Module 22: Pharmacotherapeutics**

**Module name:** Pharmacotherapeutics Module II

**Module category:** Core

**Module code:** Phar-M4221

**Module weight in ECTS:** 14 (14x27) = 378hrs

**Courses:**

<b>Course name</b>	<b>Course code</b>	<b>ECTS</b>
Integrated therapeutics III	Phar4221	7 ECTS
Integrated therapeutics IV	Phar4222	7 ECTS

**Module description:**

Students will learn about the Pathophysiology and pharmacotherapy of various disease states that health care practitioners (pharmacists) may encounter in their practice settings. Courses in this module introduce essential therapeutic knowledge needed for providing pharmaceutical care in individual patient. These courses integrate the pathophysiologic abnormalities of disease state with concepts of drug selection, dose optimization and monitoring of therapeutic outcomes for safety and efficacy of medication. Courses discussed include: integrated therapeutics I-IV which extends from general principles of pharmacotherapy to detailed pharmacotherapy of each disease states (gastrointestinal, respiratory, cardiovascular, renal, hematologic, neurologic, psychiatric, endocrinologic, infectious diseases etc.)

**Module objective:**

At the end of this module, the students are expected to:

- Explain the etiology, pathophysiology, clinical presentation and diagnosis of each disease states
- Set goals of treatment and select treatment options for the management of each disease states
- Formulate dose recommendations and pharmacokinetic considerations for individual patient management
- Monitor clinically significant adverse drug reactions and drug interactions
- Evaluate therapeutic outcomes for effectiveness, safety and patient adherence

- Develop and exercise pharmaceutical care planning for managing a specific patient condition
- Provide patient medication counseling and drug information

**Module competency:**

Provide patient centered Pharmaceutical care services

**Mode of delivery: Parallel**

**Mode of Assessment:**

Continuous assessment & summative assessment: Class attendance, Continuous assessment, Assignments, Hospital attachment Report, Final Exam

**Module learning teaching methods**

Illustrated lectures and group discussions, Individual and group exercise and assignments, Role plays and case studies, Simulation, Audiovisuals, Clinical scenarios, Tutorials, demonstration

## Course Syllabus

<b>Integrated therapeutics III Course syllabus</b>
<b>Course name: Integrated Therapeutics III</b>
<b>Course code:</b> Phar4221
<b>Module name:</b> Pharmacotherapeutics module
<b>Module code:</b> Phar-M4221
<b>Course ECTS:</b> 7 ECTS
<b>Totally required hours for the module:</b> 7x27 = 189 hours
<b>Lecture:</b> 60 hours
<b>Ward attachment:</b> 30 hours
<b>Tutorial:</b> 34 hours
<b>Home study:</b> 46 hours
<b>Assessment:</b> 14 hours
<b>Project work/presentation:</b> 15 hours
<b>Year/Semester Course is offered:</b> Year IV/Semester I
<b>Pre-requisite if any:</b> Integrated Therapeutics I
<b>Course description:</b> <p>This is the third course in a sequence of four integrated therapeutics courses in the curriculum. The areas of therapeutic focus in integrated therapeutics-III include: psychiatric diseases, neurological diseases, gynecologic and obstetric disorders, urological disorders, immunological and musculoskeletal disorders. The course will utilize the case-assisted student-centered learning format to enhance the student's ability to apply and utilize information in solving problems and/or enhancing patient care with medications.</p>
<b>Course objectives:</b> <p>After completion of this course, the student will be able to describe, analyze and identify various psychiatric, neurologic, immunological, gynecology and obstetrics, urologic and musculoskeletal disorders; and manage drug therapy.</p> <p>To meet this objective, students will:</p> <ul style="list-style-type: none"><li>• Describe the pathophysiologic processes underlying, psychiatric, neurologic, musculoskeletal, gynecology and obstetrics, urologic and immunological disorders.</li><li>• Analyze and interpret diagnostic findings relevant to, psychiatric, neurologic, musculoskeletal, gynecology and obstetrics, urologic and immunological disorders.</li></ul>



- Recommend appropriate treatment regimen for patients suffering from psychiatric, neurologic, musculoskeletal, gynecology and obstetrics, urologic and immunological disorders.

**Course mode of delivery:** Parallel

**Course learning and teaching methods:**

- During this course the following mode of teaching can be used:
- Illustrated lectures and group discussions
- Individual and group exercise and assignments
- Role plays and case studies
- Problem-based learning
- Simulation
- Audiovisuals
- Clinical scenarios
- Tutorials
- Demonstration

**Assessment mechanisms:**

- Quizzes: 10%
- Seminar presentations: 10%
- Mid Exam: 20%
- Bedside presentation: 15%
- Assignments 5%
- Final Exam 40%

**Teachers' and students' role**

**Roles of Instructors:**

Instructors should be well versed in the outcomes expected of students and the pedagogical methods that best enhance learning. Accordingly, they will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Closely supervise in actual practice in different clinical and community settings
- Assists students in resolving ever-increasing ethical dilemma in the service delivery
- Foster and assess self-initiated student learning
- Read and comment assignments of students on time
- Prepare his/her lessons and deliver lectures

- Provide available and necessary reference materials
- Encourage active participation of students in the teaching learning process;
- Strive to be the role model ethically and professionally

### **Roles of Students**

Students are expected to:

- Make every effort to apply valid research findings and theoretical teachings into practice in various practice settings
- Engage in learning by doing independent study, project work; group work, etc..
- Be active learners (participate effectively in group assignments, perform practice actively, make presentations, write reports, prepare seminars etc.);
- Critically assess laws, regulations, journal articles and related topics from different sources

### **References:**

#### **Required readings (Text)**

1. Dipiro JT, Talbert RL, Yee GC, et.al. Pharmacotherapy, a Pathophysiologic Approach. 10<sup>th</sup> or later edition.

#### **Recommended readings**

2. Koda - Kimble MA, Young LY , Kradjan WA, et.al. Applied Therapeutics, The Clinical Use of Drugs. 11<sup>th</sup> or later edition.
3. Walker R and Edwards C. Clinical Pharmacy and Therapeutics. 3rd or later edition.
4. Kasper, Braunwald, et al. Harrison’s Principles of Internal Medicine, 20<sup>th</sup> or later edition
5. Tierney, McPhee, Papadakis. Current Medical Diagnosis and Treatment 2020 or later edition
6. Conn’s Current therapy 2020
7. Washington Manual of Medical Therapeutics 32<sup>nd</sup> edition
8. Jacobs & DeMott Laboratory Test Handbook, 5th edition
9. Handouts including copies of PowerPoint slides from lectures
10. Guidelines and articles as specified by the instructor

### **Course Schedule:**

Week	Contact Hr	Topic/sub-topic/chapter/Assessments/Assignments	Reading Material
1	2 hrs	Psychiatric disorders Pharmacotherapy: Childhood disorders	Reference No. 1, 3
	2 hrs	Psychiatric disorders Pharmacotherapy: Sleep disorders, Eating disorders	Reference No. 1, 2, 3

	2 hrs	<i>Bed-side/ward attachment</i>	
2	2 hrs	Psychiatric disorders Pharmacotherapy: Anxiety Disorders	Reference No. 1, 3
	2 hrs	Psychiatric disorders Pharmacotherapy: Schizophrenia	Reference No. 1, 3
	2 hrs	<i>Bed-side/ward attachment</i>	
2	2 hrs	Psychiatric disorders Pharmacotherapy: Eating Disorders	Reference No. 1, 3
	2 hrs	Psychiatric disorders Pharmacotherapy: Mood disorders I (Major depressive disorder)	Reference No. 1, 3
	2 hrs	<i>Bed-side/ward attachment</i>	
3	2 hrs	Psychiatric disorders Pharmacotherapy: Mood disorders I (Major depressive disorder)	
	2 hrs	Psychiatric disorders Pharmacotherapy: Mood disorders II (Bipolar Disorders I)	Reference No. 1, 3
	2 hrs	<i>Bed-side/ward attachment</i>	
3	2 hrs	Psychiatric disorders Pharmacotherapy: Substance abuse-related disorder	Reference No. 1, 3
	2 hrs	Case studies on Schizophrenia, Major depression, bipolar disorders	
	2 hrs	<i>Bed-side/ward attachment</i>	
4	2 hrs	Neurological disorder Pharmacotherapy: Pain management	Reference No. 1, 3
	2 hrs	Neurological disorder Pharmacotherapy: Headache disorders	Reference No. 1, 3
	2 hrs	<i>Bed-side/ward attachment</i>	
5	2 hrs	Neurological disorder Pharmacotherapy: Epilepsy	Reference No. 1, 3
	2 hrs	Neurological disorder Pharmacotherapy: Epilepsy	
	2 hrs	<i>Bed-side/ward attachment</i>	
6	2 hrs	Neurological disorder Pharmacotherapy: status epileptics	Reference No. 1, 3
	2 hrs	Neurological disorder Pharmacotherapy: Parkinsonism	Reference No. 1, 3
	2 hrs	<i>Bed-side/ward attachment</i>	
7	2 hrs	Neurological disorder Pharmacotherapy: Alzheimer's disease	Reference No. 1, 3
	2 hrs	Neurological disorder Pharmacotherapy: Acute management of brain injury, Multiple Sclerosis	Reference No. 1, 3
	2 hrs	<i>Bed-side/ward attachment</i>	
7	2 hrs	Case studies on Seizure and epilepsy, HA, pain management)	
	2 hrs	50% continuous assessment report	
	2 hrs	<i>Bed-side/ward attachment</i>	
8	2 hrs	Musculoskeletal disorders Pharmacotherapy: Osteoporosis/osteomalacia	
	2 hrs	Musculoskeletal disorders Pharmacotherapy: Osteoarthritis	

	2 hrs	<i>Bed-side/ward attachment</i>	
9	2 hrs	Musculoskeletal disorders Pharmacotherapy: Rheumatoid Arthritis	
	2 hrs	Musculoskeletal disorders Pharmacotherapy: Gout and Hyperuricemia	
	2 hrs	<i>Bed-side/ward attachment</i>	
10	2 hrs	Gynecologic and obstetric disorders Pharmacotherapy: Pregnancy associated diseases (eclampsia/pre-eclampsia)	Reference No. 1, 3
	2 hrs	Gynecologic and obstetric disorders Pharmacotherapy: Pregnancy associated diseases (GDM)	
	2 hrs	<i>Bed-side/ward attachment</i>	
11	2 hrs	Gynecologic and obstetric disorders Pharmacotherapy: Pregnancy associated diseases (Nausea and vomiting, hyperemesis gravidarum)	
	2 hrs	Gynecologic and obstetric disorders Pharmacotherapy: Contraception	
	2 hrs	<i>Bed-side/ward attachment</i>	
12	2 hrs	Gynecologic and obstetric disorders Pharmacotherapy: Contraception	
	2 hrs	Gynecologic and obstetric disorders Pharmacotherapy: Menstruation-related disorders	
	2 hrs	<i>Bed-side/ward attachment</i>	
13	2 hrs	Gynecologic and obstetric disorders Pharmacotherapy: Hormone therapy in women	
	2 hrs	Gynecologic and obstetric disorders Pharmacotherapy: Female infertility	
	2 hrs	<i>Bed-side/ward attachment</i>	
14	2 hrs	Case studies on Gynecology and obstetrics disorders	
	2 hrs	Urologic disorders Pharmacotherapy: Erectile Dysfunction	
	2 hrs	<i>Bed-side/ward attachment</i>	
15	2 hrs	Urologic disorders Pharmacotherapy: BPH, Urinary incontinence	
	2 hrs	Case studies on BPH and ED	
	2 hrs	<i>Bed-side/ward attachment</i>	
16	2 hrs	Immunological Disorders Pharmacotherapy: Systemic Lupus Erythematosus and Other Collagen-Vascular diseases	
	2 hrs	Immunological Disorders Pharmacotherapy: Solid-Organ Transplantation	
	2 hrs	<i>Bed-side/ward attachment</i>	
20	2 hrs	Case studies on SLE, Solid organ transplantation	
		Final exam	

## **Integrated Therapeutics IV Course syllabus**

**Course name:** Integrated Therapeutics IV

Course code: Phar4222

**Module name:** Pharmacotherapeutics module II

**Module code:** Phar-M4222

**Course ECTS:** 7 ECTS

**Totally required hours for the module:**  $7 \times 27 = 189$  hours

**Lecture:** 60 hours

**Ward attachment:** 30 hours

**Tutorial:** 34 hours

**Home study:** 46 hours

**Assessment:** 14 hours

**Project work/presentation:** 15 hours

**Year/Semester Course is offered:** Year IV/Semester II

**Pre-requisite if any:** Integrated Therapeutics I

### **Course description:**

This course is a continuation of integrated therapeutics III. It is designed to prepare graduate pharmacy students to manage a number of common diseases, including infectious, oncologic and hematologic, and nutritional disorders. It also prepares students to develop rational drug therapy plans, identify conditions for monitoring pharmacotherapy, and conditions that require referral.

### **Course objectives:**

After completion of this course, the student will be able to describe, analyze and identify various infectious, oncologic, hematologic, and nutritional disorders; and manage drug therapy.

#### Specific Objectives

To meet this objective, students will:

- Describe the pathophysiologic processes underlying infectious diseases, oncologic, immunologic, nutritional disorders.
- Analyze and interpret diagnostic findings relevant to infectious, oncologic, hematologic, and nutritional disorders.
- Recommend appropriate treatment regimen for patients suffering from infectious, oncologic, hematologic, and nutritional disorders.

- Provide follow up and monitor outcomes in patients who have infectious, oncologic, hematologic, and nutritional disorders
- Perform research and activities in pharmacotherapy of infectious, oncologic, hematologic, and nutritional disorders.

**Course mode of delivery:** Parallel

**Course learning and teaching methods**

During this course the following mode of teaching can be used:

- Illustrated lectures and group discussions
- Individual and group exercise and assignments
- Role plays and case studies
- Simulation
- Audiovisuals
- Clinical scenarios
- Tutorials
- Demonstration

**Assessment mechanisms:**

- |                          |     |
|--------------------------|-----|
| • Quizzes:               | 10% |
| • Seminar presentations: | 10% |
| • Mid Exam:              | 20% |
| • Bedside presentation:  | 15% |
| • Assignments            | 5%  |
| • Final Exam             | 40% |

**Teachers' and students' role**

**Roles of Instructors:**

Instructors should be well versed in the outcomes expected of students and the pedagogical methods that best enhance learning. Accordingly, they will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Closely supervise in actual practice in different clinical and community settings
- Assists students in resolving ever-increasing ethical dilemma in the service delivery
- Foster and assess self-initiated student learning
- Read and comment assignments of students on time
- Prepare his/her lessons and deliver lectures

- Provide available and necessary reference materials
- Encourage active participation of students in the teaching learning process;
- Strive to be the role model ethically and professionally

### Roles of Students

Students are expected to:

- Make every effort to apply valid research findings and theoretical teachings into practice in various practice settings
- Engage in learning by doing independent study, project work; group work, etc..
- Be active learners (participate effectively in group assignments, perform practice actively, make presentations, write reports, prepare seminars etc.);

Critically assess laws, regulations, journal articles and related topics from different sources

### References:

#### Required readings (Text)

1. Dipiro JT, Talbert RL, Yee GC, et.al. Pharmacotherapy, a Pathophysiologic Approach. 10<sup>th</sup> or later edition.

#### Recommended readings

2. Koda - Kimble MA, Young LY , Kradjan WA, et.al. Applied Therapeutics, The Clinical Use of Drugs. 11<sup>th</sup> or later edition.
3. Walker R and Edwards C. Clinical Pharmacy and Therapeutics. 3rd or later edition.
4. Kasper, Braunwald, et al. Harrison's Principles of Internal Medicine, 20<sup>th</sup> or later edition
5. Tierney, McPhee, Papadakis. Current Medical Diagnosis and Treatment 2020 or later edition
6. Conn's Current therapy 2020
7. Washington Manual of Medical Therapeutics 32<sup>nd</sup> edition
8. Jacobs & DeMott Laboratory Test Handbook, 5th edition
9. Handouts including copies of PowerPoint slides from lectures

Guidelines and articles as specified by the instructor

### Course Schedule:

Week	Contact hour	Topic/sub-topic/chapter/Assessments/Assignments	Reading Material
1	2 hrs	Infectious diseases Pharmacotherapy: Principles of antimicrobial regimen selection	Reference No. 1, 3, 6
	2 hrs	Infectious diseases Pharmacotherapy: Upper respiratory tract infections	
	2 hrs	<i>Bed-side/ward attachment</i>	

1	2 hrs	Infectious diseases Pharmacotherapy: Lower respiratory tract infections in adults	
	2 hrs	Infectious diseases Pharmacotherapy: lower respiratory tract infections in pediatrics	
	2 hrs	<i>Bed-side/ward attachment</i>	
2	2 hrs	Infectious diseases Pharmacotherapy: Infective Endocarditis	
	2 hrs	Infectious diseases Pharmacotherapy: Skin and soft tissue infections	
	2 hrs	<i>Bed-side/ward attachment</i>	
3	2 hrs	Infectious diseases Pharmacotherapy: Urinary tract infections and Prostatitis	
		Infectious diseases Pharmacotherapy: Gastrointestinal infections	
	2 hrs	Infectious diseases Pharmacotherapy: Intra-abdominal infections	
	2 hrs	<i>Bed-side/ward attachment</i>	
4	2 hrs	Infectious diseases Pharmacotherapy: Parasitic infections; Osteomyelitis and Septic arthritis	
	2 hrs	Infectious diseases Pharmacotherapy: Central Nervous System infections	
	2 hrs	<i>Bed-side/ward attachment</i>	
5	2 hrs	Infectious diseases Pharmacotherapy: Tuberculosis	
	2 hrs	Infectious diseases Pharmacotherapy: Tuberculosis	
	2 hrs	<i>Bed-side/ward attachment</i>	
6	2 hrs	Infectious diseases Pharmacotherapy: Sepsis and septic shock, Neonatal Sepsis	
	2 hrs	Infectious diseases Pharmacotherapy: Neonatal Sepsis	
	2 hrs	<i>Bed-side/ward attachment</i>	
6	2 hrs	Infectious diseases Pharmacotherapy: Sexually Transmitted Infections, Eye infections	
	2 hrs	Infectious diseases Pharmacotherapy: Human Immunodeficiency Virus infection and OIs	
	2 hrs	<i>Bed-side/ward attachment</i>	
7	2 hrs	Infectious diseases Pharmacotherapy: Human Immunodeficiency Virus infection and OIs	
	2 hrs	Infectious diseases Pharmacotherapy: Superficial fungal infections	
	2 hrs	<i>Bed-side/ward attachment</i>	
8	2 hrs	Infectious diseases Pharmacotherapy: Invasive fungal infections	
	2 hrs	Infectious diseases Pharmacotherapy: Surgical antibiotic prophylaxis	
	2 hrs	<i>Bed-side/ward attachment</i>	
8	2 hrs	Case Studies on pneumonia, meningitis, infective endocarditis, STI	
	2 hrs	Case studies on tuberculosis, HIV/AIDS, neonatal sepsis and Intra-abdominal infections	
	2 hrs	<i>Bed-side/ward attachment</i>	
9	2 hrs	50% continuous assessment report	
	2 hrs	Hematological disorders Pharmacotherapy: Anemia	Reference No. 1,3
	2 hrs	<i>Bed-side/ward attachment</i>	



10	2 hrs	Hematological disorders Pharmacotherapy: Coagulation disorders	Reference No. 1, 2 Reference No. 1, 4 Reference No. 1, 2, 3, 4
	2 hrs	Hematological disorders Pharmacotherapy: Sickle Cell disease	
	2 hrs	Hematological disorders Pharmacotherapy: Drug induced Hematological disorders	
	2 hrs	<i>Bed-side/ward attachment</i>	
11	2 hrs	Case study on anemia, coagulation disorders	Reference No. 1, 2, 3, 4
	2 hrs	Oncologic disorders Pharmacotherapy: Principles of cancer treatment and chemotherapy	
	2 hrs	<i>Bed-side/ward attachment</i>	
12	2 hrs	Oncologic disorders Pharmacotherapy: Breast cancer	Reference No. 1, 2, 3, 4
	2 hrs	Oncologic disorders Pharmacotherapy: Lung cancer	
	2 hrs	<i>Bed-side/ward attachment</i>	
13	2 hrs	Oncologic disorders Pharmacotherapy: GI malignancies (Major focus on colorectal cancer)	Reference No. 1, 2, 3, 4
	2 hrs	Oncologic disorders Pharmacotherapy: Head and neck cancer, prostate cancer	
	2 hrs	<i>Bed-side/ward attachment</i>	
14	2 hrs	Oncologic disorders Pharmacotherapy: Gynecological malignancies (major focus on Ovarian and cervical cancer)	Reference No. 1, 2, 3, 4
	2 hrs	Hematologic malignancies Pharmacotherapy: Lymphomas and Multiple myeloma	
	2 hrs	<i>Bed-side/ward attachment</i>	
15	2 hrs	Hematologic malignancies Pharmacotherapy: Acute Leukemias; Chronic Leukemias	Reference No. 1, 2, 3, 4
	2 hrs	Pharmacotherapy of oncologic emergencies	
	2 hrs	<i>Bed-side/ward attachment</i>	
16	2 hrs	Case studies on Breast CA, Colorectal Ca, Cervical Ca, Hematologic malignancies	Reference No. 1, 2, 3, 4
	2 hrs	Nutritional disorders Pharmacotherapy: Moderate acute malnutrition and sever acute malnutrition	
	2 hrs	<i>Bed-side/ward attachment</i>	
	2 hrs	Nutritional disorders Pharmacotherapy: Obesity; Nutritional considerations in major organ failure	Reference No. 1, 2, 3, 4
		Final exam	

## Pharmacognosy and Alternative Medicine module II

**Module Name: Pharmacognosy and Alternative Medicine module**

**Module Category: Core**

**Module Code: Phar-M4231**

**Module Number: 23**

**Module Weight: 3 ECTS**

**Courses:**

Course name	Course code	ECTS
Complementary and Alternative Medicine	(Phar4231)	(3 ECTS)

**Module description:** The module studies various alternative and complementary medicine practices including the Ethiopian traditional medicine.

**Module objective:** At the end of this module students will explain different forms of complementary & alternative medicines.

**Module competencies:**

- Describe & compare the role of various forms of complementary & alternative medicines in primary health care service
- Display rational usage of natural products (as drugs, foods, alternative medicines)
- Ready to provide service that ensure rational usage of natural products

**Mode of delivery (Parallel/Block): Parallel**

- Total study hour: 81 hours
- Illustrated Lecture: 32 hours
- Tutorial: 18 hours
- Seminars, assignments and presentation: 5 hours
- Assessment (continuous & final): 5 hours
- Independent study (alone or in groups): 11 hours
- Field visit = 10 hours

**Module teaching/learning method:**

Learning Activities:

- Attend lectures and demonstrations, take notes, and ask questions

- Engage in learning by doing (independent study, group assignments, presentation, report writing, and etc.)
- Participation and discussions

#### Teaching Methods

- The course facilitator is expected to lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments, guide practical sessions, correct and give feedbacks of reports of practical sessions.
- Arrange and facilitate seminar sessions, discussions and give comments and feedbacks.
- Field visit and visiting traditional practitioners

#### **Module mode of assessment:**

- Seminars and assignments
- Quizzes
- Final exam

**Course syllabus**

<b>Course Name:</b>	Complementary and Alternative Medicine
<b>Course code:</b>	Phar 4231
<b>Module Name:</b>	Pharmacognosy and Alternative Medicine II
<b>Module Code:</b>	<b>Phar-M4231</b>
<b>Course ECTS:</b>	3 ECTS
<b>Totally required hours for the module:</b>	81 hrs
<b>Year/Semester Course is offered:</b>	Year IV Semester I

**Course prerequisite/s: Pharmacognosy****Course description:**

The course is designed in such a way that the trainee gets well acquainted with the various alternative and complementary medicine practices including the Ethiopian traditional medicine. In addition, the trainee will be able to understand and make use of complementary medicine in primary health care.

**Course objective:**

After completion of this course students will be able to:

- Familiarize with the different forms of complementary medicine and also to be well oriented about the use of complementary medicine in primary health care. Furthermore, the trainee is expected to apply the knowledge gained in this course in providing health education about the potential benefits and risk associated with a given herb, herb-drug interaction to other health care professionals and patients, monitoring, and reporting of adverse drug reaction associated with herbal medicine.

**Course mode of delivery:** Block

**Course learning and teaching methods**

- Illustrated Lecture: 32 hours
- Tutorial: 8 hours
- Seminars and assignments: 10 hours
- Field visit and visiting traditional practitioners: 10 hours

- Assessment : 8 hours
- Independent study hour: 13hours Assessment

#### **Assessment techniques:**

- Seminar/Assignments: 25%
- Continuous assessment = 30%,
- Quizzes = 5%)
- Final Exam: 40%

#### **Teachers' and students' role**

##### **Roles of Instructors**

- The instructor will be expected to:
  - Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
  - Read and comment assignments of students on time;
  - Prepare his/her lessons and deliver lectures;
  - Provide available and necessary reference materials;
  - Encourage active participation of students in the teaching learning process;
  - Assist students with learning difficulties and
  - Arrange and follow up practical sessions
- Roles of Students

##### **Students are expected to:**

- Engage in learning by doing (independent study, project work; group work, etc.)
- Be active learners (participate effectively in laboratory activities, in group assignments, make presentations, write reports, etc.);

#### **References:**

1. WHO, Traditional Medicine and Health Care Coverage, WHO, Geneva, 1983
2. Steven B Kayne. Complementary and Alternative Medicine. Pharmaceutical Press 2009.

## Course schedule

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments
1	2hrs	1. Introduction 1.1. Definition of Terms - Traditional medicine, Ethnomedicine, Allopathy, CAM etc. 1.2. Traditional Medicine versus modern medicine 1.3. Traditional medicine policy (national and global perspectives)
2 -3	4hrs	2. Ethiopian Traditional Medicine 2.1. Historical background of Ethiopian Traditional Medicine 2.2. Principles 2.3. Methods of practice and practices 2.4. Documentation 2.5. Clinical trials/ scientific investigations
4	3hrs	3. African Traditional Medicine 3.1. Historical development of African Traditional Medicine 3.2. Principles 3.3. Methods and areas of practice 3.4. Practitioners 3.5. Documentation 3.6. Clinical trials
5 - 14	21hrs	4. Some popular complementary and alternative medical practices 4.1. Medical herbalism (4 hrs) Herbal Medicine, herbs as therapeutic agents, various ways of preparing herbs as therapeutics in traditional medicine, areas of practice, significant herbs used in CAM (including some commonly used herbal medicines in Ethiopia, <i>Moringa stenopetala</i> , <i>Ocimum lamifolium</i> and other <i>Ocimum</i> species, garlic, fenugreek seed, ginger, etc), quality control and standardization of herbal medicine, safety and pharmacovigilance of herbal medicines (herbavigilance) 4.2. Aromatherapy (2 hrs) Definition, Historical background, Principles and laws of cure, Areas of practice, Methods and materials used in the healing process 4.3. Nutraceuticals (1 hrs) 4.4. Homeopathy (4 hrs) Definition, Historical background, Principles and laws of cure, Areas of practice, Methods and materials used in the healing process, Practitioners, Clinical trials/current scientific investigations 4.5. Traditional Chinese Medicine (3 hrs)

		<p>Definition, historical development, principles, examples of Chinese Traditional Medicine, Acupuncture, herbal medicine in China</p> <p>4.6. Traditional Indian Medicine (3 hrs)</p> <p>Definition, Historical development, Examples of Indian Complementary Medicine,</p> <p>4.6.1. Ayurveda</p> <p>Principles of Ayurvedic medicine, Methods and materials used, Areas of practice, Clinical trials, Current scientific investigations</p> <p>4.6.2. Unani</p> <p>Principles of Unani, Methods and materials used in the healing process, Areas of practice, Scientific investigations,</p> <p>4.7. Oriental Medicine (2 hrs)</p> <p>Definition of terms and introduction, Historical development, Principles of Oriental Medicine, Methods and materials used for diagnosis/healing etc., Regions of practice, Scientific investigations</p> <p>4.8. Naturopathy (2 hrs)</p> <p>Definition of terms and introduction, Historical development, Principles of Naturopathy, Methods and materials used for healing/diagnosis etc., Regions of practice, Scientific investigations</p>
15	2hrs	<p>5. Traditional medicine and primary health care (PHC)</p> <p>5.1. Brief overview of PHC.</p> <p>5.2. Methods of using traditional medicine in PHC.</p> <p>5.3. Training the practitioners.</p> <p>5.4. Advantages of using traditional medicine in PHC.</p>

## Module 24: Pharmacy Practice Module

**Module Name:** Pharmacy Practice Module

**Module category:** core

**Module Number:** 24

**Module Code:** Phar-M4241

**Module Weight in ECTS:** 22 ECTS

### Courses

Course name	Course code	ECTS
Drug Informatics	Phar4241	3 ECTS
Communication skills for pharmacists	Phar4172	3 ECTS
Pharmacy Law & Ethics	Phar4173	3 ECTS
Pharmacy Practice	Phar4244	7 ECTS
First Aid	Nurs4245	3 ECTS
Nutrition	Comh4246	3 ECTS

### Module description:

This module focuses on the fundamentals of Drug Informatics, Communication skills for pharmacists, Pharmacy Law & Ethics, The regulatory and routine aspects of Pharmacy Practice, First Aid and Nutrition as it applies for pharmacy practice

### Module objective:

After completion of this module students will be able to:

- Provide appropriate drug information for queires
- Describe the importance and strategies of effective communication skills in meeting pharmacists' professional responsibilities.
- Discuss the legal and ethical principles which are applied in pharmacy practices and develop responsible attitude.
- Describe the main areas of pharmacy practice and pharmacists' roles in each setting
- Provide adequate counselling on nutirutional issues for the purpose of improving outcomes of care for patients and preventing disease in the general public
- Provide basic first aid when the need arises



**Module competencies:**

By the end of this module, students should be able to:

- Develop effective communication skill with patients, physicians and other healthcare professionals
- Discuss the legal and ethical principles that apply in pharmacy practices and develop responsible attitude.
- Resolve ever-increasing ethical dilemma in the service delivery
- Provide appropriate drug information for queires
- Provide adequate counselling on nutirutional issues for the purpose of improving outcomes of care for patients and preventing disease in the general public
- Provide basic first aid when the need arises

**Mode of delivery:** Parallel

**Module teaching/learning method:**

Totally required hours for the module:  $22 \times 27 = 594$  hrs

**Mode of Assessment:**

The assessment criteria are based on continuous assessment of class activities, individual and group assignment, case presentations, role play, journal club presentations, practical attachments, report writing, tests/quizzes and final exams. This in turn can be broken down into;

Group assignments and presentations	30%
Evaluations of onsite practice performance	20%
Tests/quizzes	20%
Final Exam	30%
<b>Total</b>	<b>100%</b>

**Module learning and teaching methods****A. Learning Activities**

Students are supposed to involve in the following major learning activities:

- Learning by doing independent study, practices, group assignments, presentation, report writing, preparing seminars, resolving ethical dilemma etc...

- Participating actively in class lectures;
- Critical Analysis, summarization and presentations of journal articles and relevant documents

#### **B. Teaching Methods**

- The course instructor is expected to lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments, forming groups, encouraging students for peer learning
- Arrange and facilitate seminar sessions prepared by students

## **Drug Informatics Syllabus**

**Course name:** Drug Informatics

**Course code:** Phar 4241

**Module name:** Pharmacy Practice Module

**Module code:** Phar-M4241

Course ECTS: 3

**Totally required hours for the module:** 3 x 27 =81

The distribution of these hours will be as follows

- |                              |          |
|------------------------------|----------|
| ▪ Lecture:                   | 20 hours |
| ▪ Home study:                | 22 hours |
| ▪ Tutorial:                  | 8 hours  |
| ▪ Project work/presentation: | 8 hours  |
| ▪ Assessment:                | 8 hours  |

**Year/Semester Course is offered:** Year IV/Semester I

**Pre-requisite:** Computer literacy

### **Course Description:**

This course is designed to provide pharmacy students with an overview of drug information resources used in healthcare system. Students will learn the advantages and disadvantages of primary, secondary, and tertiary literatures and will also gain experience of extracting information from these types of literature. The students will learn how to evaluate the biomedical literature using a systematic approach and will assess the statistical analyses reported to determine whether the interpretation and conclusions are valid. Students will also have a hands-on training at the Drug Information Center, SOP on the various computer based drug information resources.

### **Course objectives:**

After completion of this course students will be able to:

- ❖ Rapidly locate and evaluate drug information sources
- ❖ Systematically manage and communicate drug information
- ❖ Apply drug information knowledge for preparation and management of formularies, guidelines and bulletins.
- ❖ Provide drug information to health care professionals and patients on the rational use of drugs.
- ❖ Compare and contrast online resources to printed resources.
- ❖ Differentiate between primary, secondary and tertiary literature.

**Course mode of delivery:** Parallel

**Module teaching/learning method:**

**Learning Activities**

Students are supposed to involve in the following major learning activities:

- Learning by doing independent study, practices, group assignments, presentation, report writing, preparing seminars, resolving ethical dilemma etc...
- Participating actively in class lectures;
- Critical Analysis, summarization and presentations of journal articles and relevant documents

**Teaching Methods**

- The course instructor is expected to lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments, forming groups, encouraging students for peer learning
- Arrange and facilitate seminar sessions prepared by students

**Assessment techniques:**

The assessment criteria are based on continuous assessment of class activities, individual and group assignment, case presentations, role play, journal club presentations, practical attachments, report writing, tests/quizzes and final exams. This in turn can be broken down into;

Assignments (monograph development, critical appraisal & drug information response) and presentations	30%
Evaluations of onsite practice performance	20%
Tests/quizzes	20%
Final Exam	30%
Total	100%

**Teachers' and students' role**

**Roles of Instructors**

Instructors should be well versed in the outcomes expected of students and the pedagogical methods that best enhance learning. Accordingly, they will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Closely supervise in actual practice in different clinical and community settings
- Assists students in resolving ever-increasing ethical dilemma in the service delivery
- Foster and assess self-initiated student learning
- Read and comment assignments of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials

- Encourage active participation of students in the teaching learning process;
- Strive to be the role model ethically and professionally

### Roles of Students

Students are expected to:

- Make every effort to apply valid research findings and theoretical teachings into practice in various practice settings
- Engage in learning by doing independent study, project work; group work, etc..
- Be active learners (participate effectively in group assignments, perform practice actively, make presentations, write reports, prepare seminars etc.);
- Critically assess laws, regulations, journal articles and related topics from different sources

### References:

#### Required readings (Text)

1. Malone PM et al. Drug Information: A Guide for pharmacists, 6<sup>th</sup> edition, McGraw-Hill Companies, Inc., 2018 USA.

#### Recommended readings

2. Online Drug Information Databases
3. American Hospital Formulary Service: Drug Information
4. Drug Facts and Comparison
5. Slaughter RL, Edwards D. Evaluating Drug Literature: A Statistical Approach, McGraw-Hill Companies, Inc., 2001, USA.
6. MSH/WHO. Managing Drug Supply, Kumarian Press, 1997, USA.

### Course schedule

Week	Contact 1 hr	Topic/sub-topic/chapter/Assessments/Assignments	Reading Material
1	1 hr	1. <b>Introduction to the concept of drug Information</b>	Reference No. 1,2
		1.1. Definitions of basic terms 1.2. The evolution of DI	
1	1 hr	1.3. Medication information services and skills 1.4. Factors influencing the evolution of the pharmacist's role as a medication information provider	

		1.5.Opportunities in specialty practice	
2	1 hr	<b>2. Types of Drug Information Resources</b>	1, 2
		2.1.Primary sources	
2	1 hr	2.2.Secondary sources	
		2.3.Tertiary sources	
3	1 hr	2.4.Other internet-based source	
		2.5.Core Drug Information Resources	
3	1 hr	2.6.Specialized Drug Information Sources	
		2.7.Evaluation of drug information sources	
4	1 hr	<b>3. Systematic approach to receiving and answering questions on drugs</b>	Reference No. 1, 2
		2.1.Steps in the modified systematic approach:	
		<ul style="list-style-type: none"> <li>• Requestor Demographics</li> <li>• Background Questions</li> </ul>	
4	1 hr	<ul style="list-style-type: none"> <li>• Ultimate Question/Categorization of Question</li> <li>• Search Strategy</li> </ul>	
5	1 hr	<ul style="list-style-type: none"> <li>• Data Evaluation, Analysis, and Synthesis</li> <li>• Formulation and Provision of Response</li> </ul>	
6	1 hr	<ul style="list-style-type: none"> <li>• Follow-Up, Follow-Through, and Documentation</li> </ul>	
7	1 hr	<b>6. Introduction to literature evaluation</b>	Reference No. 1, 2
		6.1.Controlled Clinical Trial	
		6.2.Observational studies	
7	1 hr	6.3.Review articles evaluation	
		<b>7. Evidence based clinical practice guidelines</b>	Reference No. 1, 2
8	1 hr	<b>8. Ethical/Legal Issues in Drug Information</b>	Reference No. 1, 2
		8.1.What Is Ethics and What Is Not	
		8.2.Ethical Dilemmas in Pharmacy Practice	
8	1 hr	8.3.Basics of Ethics Analysis	
		8.4.Labeling and Advertising	
9	1 hr	8.5.Liability Concerns for Internet Information	

		8.6.Intellectual Property Rights	
10	1 hr	<b>9. Professional writing</b>	Reference No.
11	1 hr	<b>10. Drugs &amp; Therapeutics Committee</b>	1, 2
		10.1. Introduction	
		10.2. Organizational Background	
		10.3. Clinical Guidelines	
		10.4. Standard Order Set Development	
		10.5. Communication within an Organization	
12	1 hr	<b>11. Formulary management</b>	Reference No. 1, 2
13	1 hr	<b>12. Drug evaluation monographs</b>	Reference No. 1, 2
		<b>13. Medication misadventures: Adverse drug reactions and medication errors</b>	Reference No. 1, 2
<b>Final exam</b>			

## **Communication skills for Pharmacists course syllabus**

**Course title:** Communication skills for pharmacists

**Course code:** Phar 4242

**Module Name:** Pharmacy Practice Module

**Module Code:** Phar-M4241

**Course EtCTS:** 3ECTS

**Total required hours for the course:**  $3 \times 27 = 81$

- Lecture: 32 hours
- Group work 10 hours
- Home study: 20 hours
- Tutorial: 10 hours
- Presentation: 10 hours
- Assessment: 8 hours

**Year/Semester Course is offered:** Year IV Semester I

**Pre-requisite if any:** None

### **Course Description:**

This course introduces students with the basic concepts of communications, establishing pharmacist-patient relationship, practical skills in communication with patients, collaborative working relationship with other healthcare professionals, conflict management, and written communication skills.

### **Course objectives:**

After completion of this course students will be able to:

- ❖ Identify the importance of communication skills in meeting pharmacists' patient care responsibilities.
- ❖ Demonstrate competency in the use of interpersonal communication skills of listening, interviewing, providing feedback, and relationship development.
- ❖ Apply appropriate communication strategies to address barriers and handle sensitive issues in interactions with patients and health care professionals.
- ❖ Analyze the impact of elements of written, verbal, and e-communication on the practitioner image.
- ❖ Collaborate with peers in developing effective interpersonal communication skills required of a pharmacist.

**Course mode of delivery:** Block



## Course learning and teaching methods

This course is taught using a variety of instructional methods including:

- Illustrated Lectures
- Active learning methods (brain storming, buzz group, discussion, etc),
- Individual and group exercises and assignments
- Presentations
- Role play

### Assessment techniques:

- |                 |     |
|-----------------|-----|
| • Quizzes       | 10% |
| • Assignment    | 10% |
| • Tests         | 20% |
| • Presentations | 20% |
| • Final Exam    | 40% |

## Teachers' and students' role

### Roles of Instructors:

Instructors should be well versed in the outcomes expected of students and the pedagogical methods that best enhance learning. Accordingly, they will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Closely supervise in actual practice in different clinical and community settings
- Assists students in resolving ever-increasing ethical dilemma in the service delivery
- Foster and assess self-initiated student learning
- Read and comment assignments of students on time
- Prepare his/her lessons and deliver lectures
- Provide available and necessary reference materials
- Encourage active participation of students in the teaching learning process;
- Strive to be the role model ethically and professionally

### Roles of Students

Students are expected to:

- Make every effort to apply valid research findings and theoretical teachings into practice in various practice settings
- Engage in learning by doing independent study, project work; group work, etc..
- Be active learners (participate effectively in group assignments, perform practice actively, make presentations, write reports, prepare seminars etc.);

- Critically assess laws, regulations, journal articles and related topics from different sources

## References:

### Required readings (Text)

1. Beardsley, R. S., Kimberlin C., Tindall, W. N., Communication Skills in Pharmacy Practice: A Practical Guide for Students and Practitioners, 6th Ed., Lippincott Williams & Wilkins, Pennsylvania, 2012.

### Recommended readings

2. Motivational Interviewing in Health Care: Helping Patients Change Behavior (2007)
3. To Err is Human: Building a Safer Health System (2000) see link for reading below.
4. Whalley B. J., Fletcher K.E., Weston S.E., Howard R.L. and Rawlinson C.F., Foundation in Pharmacy Practice, Pharmaceutical Press, London, 2008.
5. Wiedenmayer K., Summers R.S., Mackie C.A., Gous A.G.S., Everard M. and Tromp D. Developing pharmacy practice, WHO/IPF, 2006.
6. Winfield, A. J. and Richards, R. M. E. (eds.), Pharmaceutical Practice, 4th ed., Churchill Livingstone, London, 2009.
7. Berger B. A., Communication Skills for Pharmacists: Building Relationships, Improving Patient Care, 3rd edition, American Pharmacists Association, Washington DC ,2009.
8. Cipolle Robert J., Strand Linda M., Morley Peter C., Pharmaceutical Care Practice 3rd ed., the McGraw-Hill Companies Inc., New York, 2012.

## Course schedule

Week	Contact hour	Topic/sub-topic/chapter/Assessments/Assignments	Reference
1	2	1. Patient-Centered Communication and Elements of Basic Communication	1
		1.1. What Is Communication?	
2	2	1.2. Principles and Elements of Interpersonal Communication	
		1.3. Perception in Professional Communication	
2	2	1.4. Nonverbal Communication in Pharmacy	
		1.5. Barriers in Communication	
3	2	2. Establishing the pharmacist-patient relationship	1

		2.1. Patient counseling	
		2.1. Patient counseling	
4	2	2.2. Interviewing patients	
		<i>Role play on patient counselling</i>	
4	2	2.3 Educating patients	
5	2	2.4.Non-prescription medication consults	
6	2	2.5. Communication about medicines with special patients and children	
6	2	2.6. Ethical issues in patient counseling	
7	2	3. Practical Skills for Pharmacists	
		3.1. Listening and Empathic Responding	
8	2	3.2. Helping Patients Manage Therapeutic Regimens and Communication Regarding medication safety	1-4
		3.3. Assertiveness	
8	2	3.4. Interviewing and Assessment	
9	2	4. Interaction with other health professionals	
		4.1.Communication with Physicians	
		4.2.Communication with nurses	
		4.3.Communication with other pharmacists	1
		<i>Role play: communication with physicians</i>	
10	2	4.4.Communications in Organizations	
		4.5.Interviewing and being interviewed	
		4.6.Small Group Communications	
11	2	4.7.Public Communication	
		5. Conflict management	
		5.1. Managing conflict in organizations	1, 4
12	2	<i>Case study on conflict management</i>	
		6. Written communication skills	
		6.1. Note taking and documentation practices	
		6.2. Correspondences	1-3, 9
13	2	6.3. Developing patient education materials, newsletters, etc	

14	2	6.4. Preparing a patient case presentation	
15	2	6.5. Preparing a journal club presentation	
		Final exam	

## **Pharmacy Law & Ethics Course Syllabus**

**Course title:** Pharmacy Law & Ethics

**Course code:** Phar 4243

**Course ECTS:** 3 ECTS

**Course hours:** 3\*27 = 81

- Lecture: 20 hours
- Group work: 10 hours
- Presentations: 12 hours
- Tutorial: 14 hours
- Home study: 14 hours
- Assessment: 8 hours

Pre-requisite if any: - None

### **Course Description:**

The course offers topics on principles of ethical decision making, health professional patient relationship, frameworks for ethical analysis, ethical theories, ethical principles and moral values, and ethical codes, laws, regulations and directives pertaining to pharmaceutical services internationally and in Ethiopia, product registration and licensing requirements, regulations related to narcotic and psychotropic drugs. Case-study practice scenarios will also be presented to allow students make pharmaceutical care decisions based upon ethico-legal reasoning.

### **Course Objectives:**

Upon completion of the course, students will be able to:

- Explain the process of policy development and evaluation
- Identify laws governing the practice of pharmacy
- Describe the ethical principles in pharmacy practice of Ethiopia
- Identify standards and guidelines governing pharmacy practice in Ethiopia

Supporting objectives:

To meet this objective, student will be able to:

- Define pharmaceutical jurisprudence and Professional Ethics
- Discuss Laws Governing the practice of pharmacy
- Describe the Pharmaceutical legal system
- Describe Drug nomenclature and patents
- Explain about the requirements to practice pharmacy, and also to run health institutions involved in use and dispensing of pharmaceuticals

- Explain the Control of manufacture, import, export, whole sale, distribution, labeling and packaging, utilization, administration and quality assurance of pharmaceuticals
- Describe management and use of controlled substances, poisons and radiopharmaceuticals
- Identify prohibitions; legal procedures for offences and penalties for violation of Pharmaceutical laws and regulations
- Discuss the Code of ethics for pharmacists in Ethiopia

Week	Conta ct hrs	Topic/sub-topic/chapter	Reading materials
1	2	Part 1: Ethics 1. What is ethics? 2. Ethical theories <ul style="list-style-type: none"> <li>• Teleological (consequentialist) and</li> <li>• deontological (non-consequentialist) theories</li> </ul>	Reference 1,2, 8 & 16
2	2	3. Ethical principles and moral rules ☞ Autonomy; informed consent; confidentiality; beneficence/nonmaleficence; fidelity; distributive justice.	Reference 1,2 & 8
3	2	4. Ethical issues in health care: Law and ethics; rationing; assisted suicide; human drug experimentation; drug formularies 5. Framework for ethical analysis	Reference 1,2 & 16
4	2	5. Framework for ethical analysis .....	Reference 1,2 & 16
5	2	6. Professional ethics	Reference 1,2 8 & 16
6	2	7. Ethical codes FIP standards of ethical practices; code of ethics for pharmacists practicing in Ethiopia	Reference 1,2 8 & 16
7	2	8. Standards of practice for pharmacists practicing in Ethiopia	Reference 8

8	2	<p>9. The health professional–patient relationship: Consumerism versus paternalism; patients’ rights; moral rights versus legal rights to health care; health care practitioners’ duty to their patients.</p> <p>10. Introduction to Compassionate respectful and caring pharmacy professionals</p> <p>11. Importance of CRC to patients</p>	Reference 1,2 8 & 16
9	2	<p>Part 2: Laws and Regulations</p> <p>1. Laws Governing the Practice of Pharmacy</p> <p>10.1 Food, Drugs and Cosmetics Act;</p> <p>10.2 Narcotic Drugs and Psychotropic Substances Act.</p>	Reference 4,7 & 17
10	2	<p>10.3 Drug Abuse Prevention;</p> <p>10.4 Poisons Act;</p>	Reference 4, & 17
11	2	<p>10.5 Tort Law: negligence, international torts, privacy, business premises liability,</p> <p>10.6 Commercial Law: business, contract, agency, private product ownership, insurance plans and antitrust, advertising, etc.</p>	Reference 1,2, 3, 4&15
12	2	<p><b>11. Pharmaceutical Laws and Regulations</b></p> <p>11.1Pharmaceutical legal systems (legislative, executive, judicial systems);</p> <p>11.2Drug nomenclature;</p> <p>11.3Labeling and packaging requirements of pharmaceuticals;</p> <p>11.4Administration/quality assurance;</p>	Reference 1,2, 3 4,13,14,15 & 16
13	2	<p>11.1Control of fulfillment of requirements to practice pharmacy:</p> <p>11.5.1 Pharmaceutical retail outlets,</p> <p>11.5.2. Utilization of pharmaceuticals,</p> <p>11.5.3 Manufacture of pharmaceuticals,</p> <p>11.5.4 Import/export of pharmaceuticals,</p>	Reference 4,5,9,11 & 12

		11.5.5 Wholesale/ distribution of pharmaceuticals,	
14		11.5.6 Health institutions involved in use and dispensing of pharmaceuticals, 11.5.7 Dispensing of proprietaries and manufacture of nostrums; 11.5.8 Management and use of controlled substances, poisons, radiopharmaceuticals; 11.5.8.1. Prohibitions; clinical trials; legal procedures for offenses and penalties.	Reference 1,4, 7,9,10 & 12
15	2	12. Laws, regulations and directives pertaining to pharmaceutical services in Ethiopia: 12.1 product registration and marketing, 12.2 manufacturing,	Reference 1,4, 7,9,10 & 12
16	2	12.3 pharmaceutical promotions, 12.4 clinical trials, 12.5 herbal remedies, 12.6 veterinary drugs 12.7 professional licensing requirements	Reference 1,4, 6,7,9,10 & 12
17			

**Mode of delivery: Block**

- Illustrated Lectures
- Active learning methods (brain storming, buzz group, discussion, etc),
- Individual and group exercises and assignments
- Presentations
- Case study

**Mode of Assessment:**

- Quiz: 10%,
- Tests: 15%
- Assignment: 25%
- Presentation: 10%



- Final Exam: 40%

**Reference Materials:**

1. Remington's: The Science and Practice of Pharmacy, 21<sup>st</sup> edition, University of The Sciences in Philadelphia, 2005, USA.
2. Dale and Appelbe's Pharmacy Law and Ethics, 8<sup>th</sup> edition, Pharmaceutical Press, 2005, London.
3. De. Marco, C. T. Pharmacy & the law, Aspen Systems Corp., Rochville, MD, 1984.
4. Drug Administration and Control Proclamation No. No. 661/2009
5. Standards for the Establishment and Practice of Pharmaceutical Manufacturing Plant, Drug Administration and Control Authority, 2001, Addis Ababa.
6. Directive for the Regulation of Promotion and Advertisement of Drugs, Drug Administration and Control Authority, 2005, Addis Ababa.
7. Guideline to Control and Promote Proper Use of Narcotic Drugs and Psychotropic Substances, Drug Administration and Control Authority, 2004, Addis Ababa.
8. Code of Ethics and Standards of Practice for Pharmacists Practicing in Ethiopia, 2<sup>nd</sup> edition, Ethiopian Pharmaceutical Association, 2006, Addis Ababa.
9. Guidelines on the Requirements for the Registration of Pharmaceutical Manufacturers, Drug Administration and Control Authority, Addis Ababa.
10. Requirements and Guidelines for the Registration of Human Drugs, Drug Administration and Control Authority, Addis Ababa.
11. Drug Import and Wholesale Guidelines, DACA.
12. Drug Retail sale guidelines, DACA.
13. Fink III, J.I., Marquard K.W & Simonsmeir, KM, Pharmacy Law Digest, Facts and Comparison, St. Souio, MD 1998.
14. Pharmacoethics: A Problem-Based Approach (Pharmacy Education Series), David A. Gettman and Dean Arneson, CRC, 2003
15. Law, Liability & Ethics for the Medical Office Professional, Myrtle R. Flight, 4th edition, Delmar Cengage Learning, 2003.
16. Mappes, T.A., and Zembaty, J.S. (1991). Biomedical ethics (3rd ed.). New York, NY: McGraw-Hill.
17. US Food, Drug and Cosmetic Act , URL:  
<http://www.fda.gov/RegulatoryInformation/Legislation/FederalFoodDrugandCosmeticActFDCA/default.htm>



## **Pharmacy practice course syllabus**

**Course name:** Pharmacy Practice

**Course code:** Phar 4244

**Module Number:** 24

**Module Name:** Pharmacy practice module

**Module code:** Phar-M4241

**Course ECTS:** 7

**Course hours:** 7 ECTS

**Totally required hours for the module**  $7 \times 27 = 189$

Community pharmacy practice	45 hours (9hrs x 5 wks)
Hospital pharmacy practice	45 hours (9hrs x 5 wks)
Pharmaceutical industry and Drug quality assurance	36 hours (9hrs x 4 wks)
Regulatory Pharmacy and Quality control practice	18 hours (9hrs x 2 wks)
Drug supplies management	18 hours (9hrs x 2 wks)
R&D of Natural/Herbal medicines	9 hours (9hrs x 1 wks)
Home study	18 hours

**Year/Semester Course is offered:** Year IV Semester II

**Pre-requisite:** None

### **Course Description:**

This course provides series of practical attachments on pharmacy practice, including: community and hospital pharmacies, pharmaceutical industry, and drug regulatory body, Drug supplies management, and R&D of natural/herbal medicine. The course enables the student to assume the duties and responsibilities of various settings of pharmacy practice. It also enables the student to develop good working relationships with other health care professionals, and participate in public health education.

### **Course objectives:**

- To enable students enhance their skill level in the different areas of community pharmacy;
- To deliver different pharmaceutical services at hospital pharmacy settings;
- To enable students develop competence in the production and quality assurance of pharmaceuticals;
- Develop the capability to comfortably and confidently provide drug information to individuals and groups;

- To control the quality of drugs, cosmetics, food and drinks;
- To enable students aware of R&D of Natural/Herbal Medicine;
- To enable students develop competence in inventory control and store management, quantification and procurement process, the use and implementation of LMIS and APTS.

**Course mode of delivery:** Parallel

**Course learning and teaching methods**

- Introductory lectures prior o detachment to the respective practice sites
- *Practice/Visit (3 hours per day, 3 days in a week)*
- Presentations and discussions

**Assessment Technique:**

- Competence at practice including oral exam: 45%
- Seminar presentations: 15%
- Assignment: 10%
- Written exam: 30%

**Teachers' and students' role**

#### **Roles of Instructors**

Instructors should be well versed in the outcomes expected of students and the pedagogical methods that best enhance learning. Accordingly, they will be expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Closely supervise in actual practice in different clinical and community settings
- Assists students in resolving ever-increasing ethical dilemma in the service delivery
- Foster and assess self-initiated student learning
- Read and comment assignments of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials
- Encourage active participation of students in the teaching learning process;
- Strive to be the role model ethically and professionally

#### **Roles of Students**

Students are expected to:

- Make every effort to apply valid research findings and theoretical teachings into practice in various practice settings
- Engage in learning by doing independent study, project work; group work, etc..
- Be active learners (participate effectively in group assignments, perform practice actively, make presentations, write reports, prepare seminars etc.);

- Critically assess laws, regulations, journal articles and related topics from different sources

## References:

### Recommended readings

1. Winfield, A. J. and Richards, R. M. E. (eds.), *Pharmaceutical Practice*, 4<sup>th</sup> ed., Churchill Livingstone, London, 1998.
2. Smith, H. A. *Principles and Methods of Pharmacy Management*, 2nd ed. Lea & Febiger, Philadelphia, 1980.
3. Lawson, D. H. and Richards, R.H., (eds.) *Clinical Pharmacy and Hospital Drug Management*, 2<sup>nd</sup> ed. Chapman and Hall. London. 1982.
4. Remington's *Pharmaceutical Science*, 21<sup>st</sup> ed., Lippincott Williams & Wilkins, Pennsylvania, 2006.
5. National standard treatment guidelines and formularies.
6. USP/NF (Latest edition). The United States Pharmacopoeia convention, Inc. Rockville, MD., USA

### Course Schedule

Time	10:00am-12:20pm	1:30-5:30pm, 3 days per week	Tasks
Week 1 - 5	Interactive lecture x 1 wk <ul style="list-style-type: none"> <li>• Organization of a community pharmacy</li> </ul> Services provided by the community pharmacy	Community pharmacy attachment x 5 wk	<ul style="list-style-type: none"> <li>• Dispensing</li> <li>• Good dispensing practice</li> <li>• Stock management</li> <li>• Compounding extemporaneous preparations</li> <li>• Patient counseling</li> </ul> Inventory control
Week 6-10	Interactive lecture x 1 wk <ul style="list-style-type: none"> <li>• Organization of a typical hospital pharmacy</li> <li>• Traditional roles of the hospital pharmacist</li> <li>• Specializations in hospital pharmacy:</li> <li>• Pharmacy and therapeutics committee; teaching</li> <li>• Pharmacy and therapeutics committee; teaching</li> <li>• Hospital Manufacturing Activities               <ul style="list-style-type: none"> <li>○ Necessary facilities and equipments</li> <li>○ manufacturing sterile products: Enteral and parenteral nutrition (TPN), Cytotoxic admixture, Parenteral infusions</li> </ul> </li> </ul>	Attachment at Hospital pharmacies x 5 wk (Adult OPD Pharmacy, Pediatric Pharmacy, ART Pharmacy, Emergency Pharmacy, Oncology Pharmacy, Inpatient Pharmacy)	<ul style="list-style-type: none"> <li>• Prescription evaluation</li> <li>• Dispensing</li> <li>• Rational drug use</li> <li>• Compounding extemporaneous preparations and TPN</li> <li>• Patient counseling</li> <li>• ART pharmacy dispensing</li> <li>• Distribution of drugs to the different wards</li> <li>• Practice unit dose drug dispensing to inpatients</li> </ul>

	<ul style="list-style-type: none"> <li>○ Nonsterile products: Compounding, Handrub preparation</li> </ul> <p>Documentation in pharmacy practice</p>		<ul style="list-style-type: none"> <li>• Monitoring drug/food/disease interactions</li> <li>• Calculate different parenteral doses to be administered to patients</li> <li>• Monitoring appropriateness of therapy</li> <li>• Participate in morning sessions and ward visits</li> <li>• Ward visits and rounds; chart review, assessment, care plan and follow up evaluation of hospitalized patients.</li> <li>• Patient care</li> <li>• Discharge medications counseling</li> </ul>
Week 11-14		Pharmaceutical industry and Drug quality assurance x 4 wks	<ul style="list-style-type: none"> <li>• Tablet Production line</li> <li>• Capsule Production line</li> <li>• Oral Liquid Production line</li> <li>• Parenteral Liquids Production line</li> <li>• Topical dosage forms/Ointments, Creams/ Production line</li> </ul> <p>Quality Control Laboratory</p>
Week 15-16		Regulatory Pharmacy and Quality control practice	<ul style="list-style-type: none"> <li>• <b>Participate in</b> evaluating the safety, efficacy and quality of pharmaceuticals</li> <li>• Participate in disposal pharmaceuticals unfit for use</li> </ul> <p><b>Perform physicochemical and microbiological drug quality analysis</b></p>
Week 17		Research and Development	<b>Participate in natural/herbal medicine R&amp;D sites</b>
Week 18-19		Drug supplies management	<ul style="list-style-type: none"> <li>• <b>Inventory control</b></li> <li>• <b>Store management</b></li> <li>• <b>Participate in quantification and procurement process,</b></li> </ul>

			<ul style="list-style-type: none"><li>• <b>Assess rational use drugs in hospitals</b></li><li>• <b>Conduct satisfaction surveys in hospitals</b></li></ul> <b>Participate in LMIS and APTS implementation</b>
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## **First Aid Course Syllabus**

**Course title:** First aid

**Course code:** Nurs4245

**Course EtCTS:** 3

**Course hours:** 3 \*27 = 81

Pre-requisite: Anatomy and physiology

### *Course Description:*

This First aid and accident prevention course is designed for BSc degree pharmacy students as a competent provider of victims in emergency situation and also helps the students to avoid hazards to self and others. The basic first aid and accident prevention skill and knowledge and attitude required to sustain human body function and/or prevent premature death will be discussed, demonstrated and through independent home study and applied in and out of health care settings.

### *Course objectives:*

After completion of this course, the student will be able to apply knowledge and skill of first and accident prevention anywhere.

Supportive objectives

At the end of each topic the student will be able to

- Define first aid and accident prevention.
- Explain principles of first Aid
- Identify the respiratory emergency and artificial respiration
- Discuss cardiac arrest and cardiopulmonary resuscitation
- Identify the wound, types of bleeding and arrest bleeding
- Explain dressing and bandages
- Discuss injuries and caring for the causality with shock, suddenly illness
- Determine the importance of lifting and transporting of casualty safety
- Determine first aid approach for fracture, poisoning and disaster.
- Demonstrate artificial respiration, CPR, bleeding control.
- Differentiate between what to do and what not to do



WEEK/DATE	TOPIC	Contact hours	Assignments due
Week 1	<ul style="list-style-type: none"> <li>▪ Define first aid and accident prevention</li> <li>▪ Identify reasons for First Aid</li> <li>▪ Explain principles of first aid</li> <li>▪ List value of First Aid Training</li> <li>▪ Define infection prevention and patient safety</li> <li>▪ Adopt general directions for given first aid</li> </ul>	2	Assignment 1
Week 2-4	<ul style="list-style-type: none"> <li>✓ Definition respiratory Emergency</li> <li>✓ Cause of Respiratory failure <ul style="list-style-type: none"> <li>♣ Anatomic obstruction</li> <li>♣ Mechanical obstruction</li> <li>♣ Air depleted of oxygen or containing toxic gases</li> </ul> </li> <li>✓ Artificial respiration</li> <li>✓ Cardiac arrest</li> <li>✓ Cardiopulmonary resuscitation</li> </ul>	6	Case study, Re-demonstration
Week 5-6	<ul style="list-style-type: none"> <li>♣ Define wound</li> <li>♣ Wound classification based on skin integrity and cause</li> <li>♣ List types of open wound</li> <li>♣ Common causes and symptoms wound infection</li> <li>♣ First Aid for open wounds</li> <li>♣ First aid for severe bleeding</li> <li>♣ Prevention of contamination and infection of wounds</li> </ul>	4	Assignment.2
Week 7	<ul style="list-style-type: none"> <li>➤ Definition of dressings</li> <li>➤ Principles of clean dressing</li> <li>➤ Bandages</li> <li>➤ Types of commercially available bandages</li> <li>➤ Application of bandages</li> <li>➤ First Aid kits and supplies</li> </ul>	2	Re-Demonstration.
Week 8-11	<ul style="list-style-type: none"> <li>➤ Eye injuries</li> <li>➤ Head injuries</li> <li>➤ Neck injuries</li> <li>➤ Open Wounds of the chest</li> <li>➤ Abdominal injures</li> <li>➤ Burns <ul style="list-style-type: none"> <li>♣ Definition</li> <li>♣ Causes and effects</li> <li>♣ Classification based on Extent and location</li> <li>♣ First aid measures</li> <li>♣ Prevention of heat emergencies</li> </ul> </li> </ul>	8	Case study 2
Week 12-13	<ul style="list-style-type: none"> <li>☞ Definition of shock</li> <li>☞ Cause of shock</li> <li>☞ Sign and symptoms</li> <li>☞ Treatment objectives</li> <li>☞ First aid measures</li> <li>☞ Sudden illness</li> </ul>	4	Case study

	<ul style="list-style-type: none"> <li>❖ Heart attack</li> <li>❖ Stroke</li> <li>❖ Fainting</li> <li>❖ Epilepsy</li> <li>❖ Prevention of heart attack</li> <li>○ Unconsciousness</li> </ul>		
Week 14	<ul style="list-style-type: none"> <li>▪ Definitions</li> <li>▪ Fractures</li> <li>▪ Dislocation</li> <li>▪ Sprains</li> <li>▪ Prevention of Accidents resulting in skeleton &amp; muscular injuries</li> </ul> Pro.8.	2	Assignment Re-Demonstration.
Week 15	<ul style="list-style-type: none"> <li>☞ Definition</li> <li>☞ Causes</li> <li>☞ Sign and Symptoms</li> <li>☞ Objective in treatment of first aid</li> <li>☞ Contact poisons</li> <li>☞ Prevention of Accidental poisoning</li> </ul> Procedure.9	2	Case study,
Week 16	<ul style="list-style-type: none"> <li>♣ Define disaster</li> <li>♣ Types of disaster</li> <li>♣ Prevent disaster</li> </ul>	2	Assignment

**Mode of delivery:**

- Lecture
- Discussion
- Demonstration and role play
- Video show

Teaching aids and materials (course logistics)

- Human Anatomic Models/dolls
- Demonstration equipment and Instruments
- Chalk and board, white board
- Audiovisual aid (LCD, OHP, Laptop)

**Mode of Assessment:**

Formative assessment

- Attendance and class activity
- Practical exam (skill lab)

- Assignment
- Quiz

Summative assessment

Assignments	10%
Test	30%
Written final exam	40%
Practical exam (skill lab)	20%

Course policy:

- A student who is unable to pass 50% of the continuous assessment should not be allowed to sit for final exam
- Attendance:
  - The student who is absent from over 20% of the contact hours should not be eligible for final examination and is enforced to repeat the course
  - 100% attendance for practical/skill/lab hours

*Reference*

1. Skeet, M. First Aid for Community health worker to developing countries. Macmillan/tong Kong 1984.
2. American Red Cross standard first Aid and Personal Safety, 2<sup>nd</sup> ed. New York 1979.
3. Caroline L. Nancy. Emergency care in the streets U.S.A. 19979.
4. Warner. C. Germanie. Emergency cares Assessment and intervention 3<sup>rd</sup> Ed. The C.V Mosey Comp. London 1983
5. Infection prevention and patient safety guideline of Ethiopia, February 2005

## **Nutrition Course Syllabus**

**Course title:** Nutrition

**Course code:** ComH4246

**Course ECTS:** 3

**Course hours:** 3\*27 = 81

Pre-requisite if any: None

### *Course Description:*

This human nutrition course is designed to prepare Bachelor of pharmacy students in order to be competent in nutrition related to health and disease. The course is designed to introduce students to normal nutrition, diet therapy, infant & child and maternal nutrition. It helps the students to identify different nutrients and to be competent in assessing and managing nutrition and nutrition related problems in the community and for women, children and PLWHA in particular. It also helps students to recognize public importance of ensuring food safety and quality.

### **Course Objectives:**

After completion of this course, the student will be able to recognize essential nutrients for life function, develop skill on nutritional assessment methods, recognize nutritional intervention methods and also able to apply them in promotion of health and in the care of the sick in an effective and integrated manner.

### **Supporting objectives:**

At the end of this course, the students will be able to:

- Explain the historical development of nutrition
- Describe the characteristics and types, physiological functions, and food sources of essential nutrients
- Explain recommended intakes and the adverse effects of both inadequate and excessive intake of nutrients
- Describe the epidemiology, population at risk, classification, clinical feature and management of malnutrition
- Analyze and develop skill on the major nutritional assessment methods
- Discuss infant and young child feeding options
- Describe the public health importance nutritional deficiency states in Ethiopia
- Integrate maternal nutrition with other programs and services
- Describe the management algorithm for HIV patients with malnutrition

- Describe the importance and application of nutritional surveillances
- Prevent micronutrient deficiencies through active participation in micronutrient supplementation programs and control of common infections such as malaria and helmenthiasis
- Control micronutrient deficiencies through proper therapeutic supplementation with micronutrients
- Discuss the public health importance of ensuring food safety and quality in terms of protection from microbiological hazards, pesticide residues, misuse of food additive, chemical contaminants, biological toxins (national toxins in foods), and adulteration.

## Course schedule

Week/date	Lesson/ Topics	Teaching methods	Duties expected from the instructor	Duties expected from students	Assignments due/evaluation	Required readings
Day 1	Introduction to nutrition <ul style="list-style-type: none"> <li>Historical development of nutrition</li> <li>Terminologies</li> <li>Growth and development</li> <li>Consequences of malnutrition</li> <li>Major factors contribute to malnutrition.</li> </ul>	Exercise Brain storming Illustrated and interactive lectures Group discussion	<ul style="list-style-type: none"> <li>Introducing the objective of the lesson</li> <li>Give class ,home and library works</li> <li>Monitor students activities</li> <li>Give gap lectures</li> <li>Give concluding remarks</li> </ul>	Grasping lesson objectives Participating in activities <b>In class room:</b> Discussing with groups on factors that can affect nutrition <b>Outside class room:</b> Library work: read books on historical development of nutrition, terminologies used in nutrition	Project work Group assignment	<ul style="list-style-type: none"> <li>Melkie E, Human nutrition lecture note</li> <li>Tefera B. nutrition lecture note</li> </ul>
Day 2	<b>Carbohydrates, Proteins</b> <b>Lipids</b> Functions, Types, Food Sources, Digestion, Absorption, metabolism, RDA	Exercise Brain storming Illustrated and interactive lectures Group discussion	<ul style="list-style-type: none"> <li>Introducing the objective of the lesson</li> <li>Asking brainstorming questions</li> <li>Give class ,home and library works</li> <li>Monitor students activities</li> <li>Give gap lectures</li> <li>Give concluding remarks</li> </ul>	Grasping lesson objectives Participating in activities <b>In class room:</b> Discussing with groups on food sources of CHOs and proteins <b>Outside class room:</b> Library work: read books on carbohydrates and proteins	Quiz 1 On previous lesson	<ul style="list-style-type: none"> <li>Tefera B &amp; Melkie E, human nutrition lecture notes</li> <li>Dudek, nutrition hand book for nursing practice</li> </ul>
Day 3	<b>Vitamins, Minerals</b> Functions, Types, Food Sources, Digestion, Absorption, metabolism, RDA	Exercise Brain storming Illustrated and interactive lectures Group discussion	<ul style="list-style-type: none"> <li>Introducing the objective of the lesson</li> <li>Asking brainstorming questions</li> <li>Give class ,home and library works</li> <li>Monitor students activities</li> <li>Give gap lectures</li> <li>Give concluding remarks</li> </ul>	Grasping lesson objectives Participating in activities <b>In class room:</b> Discussing with groups on types and functions of lipids <b>Outside class room:</b> Library work: read books on lipids and vitamins	<b>Exam one</b>	<ul style="list-style-type: none"> <li>Melkie Edris, Tefera B. Human nutrition lecture notes</li> <li>Dudek, nutrition hand book for nursing practice</li> </ul>
Day 4	<b>Nutrition requirement:</b> <ul style="list-style-type: none"> <li>Methods of calculating normal food requirements</li> <li>Influence of age sex and occupation</li> <li>Nutrition value of common foods</li> </ul>	Exercise Brain storming Illustrated and interactive lectures Group discussion	<ul style="list-style-type: none"> <li>Introducing the objective of the lesson</li> <li>Give class ,home and library works</li> <li>Monitor students activities</li> <li>Give gap lectures</li> <li>Give concluding remarks</li> </ul>	Grasping lesson objectives Participating in activities <b>In class room:</b> Do exercise on calculation of nutritional requirement <b>Outside class room:</b> Library work: read books on nutritional requirement	Reading assignment Exercise 2	Dudek, nutrition hand book for nursing practice  Human energy requirements Report of a Joint FAO/WHO/UNU Expert Consultation Rome, October 2001

				<b>Home take assignment:</b> Producing sample Menu		
Day 5	Nutritional deficiency states <ul style="list-style-type: none"> <li>Chronic energy deficiency.</li> <li>Micronutrient deficiencies</li> </ul>	Exercise Brain storming Illustrated and interactive lectures Group discussion	<ul style="list-style-type: none"> <li>Introducing the objective of the lesson</li> <li>Asking brainstorming questions</li> <li>Give class ,home and library works</li> <li>Monitor students activities</li> <li>Give gap lectures</li> <li>Give concluding remarks</li> </ul>	Grasping lesson objectives Participating in activities <b>In class room:</b> Discussing about PEM,IDA,IDD and VAD <b>Outside class room:</b> Library work: read books on nutritional deficiencies common in Ethiopia	<b>Exam two</b>	Tefera B. Human nutrition lecture note  National guideline for control and prevention of micronutrient deficiency ,FMOH, June 2004  Management of SAM: A manual for physicians and other senior health Workers WHO,Geneva,1999
Day 6-7	Nutritional deficiency states continued Nutritional assessment: <ul style="list-style-type: none"> <li>Anthropometry</li> <li>Biochemical method</li> <li>Clinical method</li> <li>Dietary survey method</li> </ul> Prevention and control	Exercise Brain storming Illustrated and interactive lectures Group discussion	<ul style="list-style-type: none"> <li>Introducing the objective of the lesson</li> <li>Give class ,home and library works</li> <li>Monitor students activities</li> <li>Give gap lectures</li> <li>Give concluding remarks</li> </ul>	Grasping lesson objectives Participating in activities <b>In class room:</b> Discussing on methods of nutritional assessment Practice methods of assessment <b>Outside class room:</b> Library work: read books on nutritional assessment	Quiz 3 (Summative)	Teferra.B Human nutrition lecture note  Gibson, principles of nutritional assessment ,oxford,1990
Day 8-9	Nutritional deficiency states continued <ul style="list-style-type: none"> <li>Diet as therapeutic agent</li> <li>Diet and the patient</li> <li>Hospital diets</li> </ul>	Exercise Brain storming Illustrated and interactive lectures Group discussion	<ul style="list-style-type: none"> <li>Introducing the objective of the lesson</li> <li>Asking brain storming questions</li> <li>Give class ,home and library works</li> <li>Monitor students activities</li> <li>Give gap lectures</li> <li>Give concluding remarks</li> </ul>	Grasping lesson objectives Participating in activities <b>In class room:</b> List and discuss fluid diets Special diets with related to disease <b>Outside class room:</b> Library work: read books on factors affecting human food selection	<b>Exam three</b>	<ul style="list-style-type: none"> <li>Melkie Edris, Human nutrition lecture note</li> <li>Dudek, nutrition hand book for nursing practice</li> </ul>
Day 10-11	Nutritional care and support for PLHIV	Brain storming Illustrated and interactive lectures Group discussion	<ul style="list-style-type: none"> <li>Introducing the objective of the lesson</li> <li>Asking brain storming questions</li> <li>Give class ,home and library works</li> <li>Monitor students activities</li> <li>Give gap lectures</li> <li>Give concluding remarks</li> </ul>	Grasping lesson objectives Participating in activities <b>In class room:</b> Discussing on HIV and Nutrition <b>Outside class room:</b> Home work: read updated national guideline for HIV/AIDS and nutrition	Quiz 4 formative	<ul style="list-style-type: none"> <li>Melkie Edris and Tefera B Human nutrition lecture notes</li> <li>FMOH: National guidelines for HIV/AIDS and Nutrition,2008</li> <li>Nutrition and HIV/AIDS A Training Manual For Nurses and Midwives, updated on 2010</li> </ul>

Day 12-13	<b>Nutritional interventions</b> for major nutritional problems in Ethiopia Methods, mechanisms and criteria, Essential Nutrition Actions(ENA) <b>Teaching Good nutrition</b>	Brain storming Illustrated and interactive lectures Group discussion	<ul style="list-style-type: none"> <li>• Introducing the objective of the lesson</li> <li>• Asking brain storming questions</li> <li>• Give class ,home and library works</li> <li>• Monitor students activities</li> <li>• Give gap lectures</li> <li>• Give concluding remarks</li> </ul>	Grasping lesson objectives Participating in activities <b>In class room:</b> Discussing with groups about ENA <b>Outside class room:</b> Library work: read books on nutritional intervention methods	Home take assignment and Group presentation	<ul style="list-style-type: none"> <li>• Tefera B. Human nutrition lecture note</li> <li>• ENA counselor guide, FMOH, revised January 2005</li> </ul>
Day 14- 15	The quality and safety of nutrition related products	Exercise Brain storming Illustrated and interactive lectures Group discussion Role play Seminar presentation	<ul style="list-style-type: none"> <li>• Introducing the objective of the lesson</li> <li>• Asking brain storming questions</li> <li>• Give class ,home and library works</li> <li>• Monitor students activities</li> <li>• Give gap lectures</li> <li>• Check students work</li> <li>• Give concluding remarks</li> </ul>	Grasping lesson objectives Participating in activities <b>In class room:</b> Discussing with groups on the public health importance of ensuring food safety and quality in terms of protection from microbiological hazards, pesticide residues, misuse of food additive, chemical contaminants, biological toxins (national toxins in foods), and adulteration <b>Outside class room:</b> Library work: read books on food safety and quality	Quiz 5 (Summative) presentation	<ul style="list-style-type: none"> <li>• Melkie Edris and Tefera B Human nutrition lecture notes</li> </ul>
Day 16					Final Exam	



**Mode of delivery: Block**

- ❖ Brain storming
- ❖ Illustrated and interactive lectures
- ❖ Group discussion
- ❖ Case study
- ❖ Individual and group exercises
- ❖ Seminar/ presentation

**Mode of Assessment:**

- Exercises
- Quizzes
- Individual assignment
- Presentation

**Summative assessment**

Quizzes	10%
Group and individual assignment	20%
Tests	20%
Presentation	10%
Final exam	40%

**Learning materials:**

- Printed materials (text books, manual exercises, learning guides, handout)

## Text Books:

1. Melkie Edris, Human Nutrition for Health Science students, Gondar University, 2004.
2. Tefera Belachew. Human Nutrition for health science students. Lecture note series. Jimma University, Faculty of Public Health, January 2003.

**References:**

1. Dudek S.G., Nutrition hand book for nursing practice, third ed Lippincott, Newyork, 1997
2. FMOH: Protocol for management of sever acute malnutrition(SAM) in Ethiopia, 2007
3. Human energy requirements Report of a Joint FAO/WHO/UNU Expert Consultation Rome, 17–24 October 2001

4. Management of severe Malnutrition: A manual for physicians and other senior health Workers  
WHO,Geneva,1999
5. FMOH: National guidelines for HIV/AIDS and Nutrition,2008
6. Nutrition and HIV/AIDS A Training Manual For Nurses and Midwives, updated on 2010
7. National nutrition guideline
8. ENA counselor guide, FMOH, revised January 2005
9. National guideline for control and prevention of micronutrient deficiency ,FMOH, June 2004
10. Gibson, principles of nutritional assessment ,oxford,1990

## **Module 25: Professional Elective Courses**

**Module Name:** Professional Elective

**Module Category:** Elective

**Module code:** Phar-M4252

**Module Number:** 25

**Module weight in ECTS:** 5 ECTS

### Courses

<b>Course</b>	<b>Course code</b>	<b>ECTS</b>
Introduction to Pharmacoepidemiology	Phar4251	5 ECTS
Phytochemistry	Phar4252	5 ECTS
Pharmaceutical Manufacturing	Phar4253	5 ECTS
Pharmacogenetics	Phar4254	5 ECTS
Pharmaceutical Quality control and quality assurance	Phar4255	5 ECTS
Drug design and synthesis	Phar4256	5 ECTS
Warehouse management	Phar4257	5 ECTS
Research in pharmacology	Phar4258	5 ECTS

## **Introduction to Pharmacoepidemiology Course Syllabus**

**Module name:** Professional elective

**Module Number in which the course exists:** 25

**Course title:** Introduction to Pharmacoepidemiology

**Course code:** Phar 4251

**Course ECTS:** 5

**ECTS credits:** 5 (This course needs a total of  $5 \times 27 = 135$  working hours to spend in each teaching and learning as well as assessment activities). The distribution of these hours will be as follows

- Lecture: 48 hours
- Project work: 14 hours
- Presentations=10 hours
- Case studies/journal club=10 hours
- Tutorial: 8 hours
- Home study: 38 hours
- Assessment=7 hours

Pre-requisite if any:

### *Course Description*

The goal of the course is to introduce pharmacoepidemiology and drug safety and research application for post-marketing drug safety surveillance. The course will describe how to develop a research protocol and conduct a research, describe various health care data sources used for research, and discuss how pharmacoepidemiology contribute to pharmacy practice, such as, drug utilization review, assessment of drug therapy, and adverse drug reaction monitoring. A series of case studies from thalidomide to cisapride to cerivastatin will be also discussed in class. Students can have a better understanding of Pharmacoepidemiologic research, drug safety regulatory, pregnancy registry, and risk management.

q. Course Objective:

Upon completion of this course, the students will be able to:

- ☞ Describe the purposes and scope of pharmacoepidemiology
- ☞ Describe and explain basic concepts in pharmacoepidemiology and its relevance for publichealth and for health policy making.
- ☞ Describe the relationship between national drug policies and Pharmacoepidemiology

- ☞ Describe the basic pharmacoepidemiologic concepts and measures of drug-related occurrence and its effect in population;
- ☞ Discuss common study designs and methods used in pharmacoepidemiological studies.
- ☞ Explain the applications of pharmacoepidemiological methods for studies of effects and adverse effects of drugs and economic consequences.
- ☞ Assess the relevance and limitations of various pharmacoepidemiological research designs
- ☞ Describe systems for the reporting of adverse effects and their use for pharmacoepidemiology.
- ☞ Apply pharmacoepidemiologic principles in practice.
- ☞ Discuss Pharmacovigilance in drug development
- ☞ Evaluate drug safety case studies and policy implications based on the medical and pharmacy literature.

**Skills and abilities:**

On successful completion of the course, the student should be able to:

- ☞ Review and evaluate pharmacoepidemiological studies.

Week	Contact hrs	Topic/sub-topic/chapter	Reading materials	Remark
1	4	1. Introduction 1.1. What is Pharmacoepidemiology? 1.2. Contributions of Pharmacoepidemiology	Reference 2 & 4	
2	4	2. National medicinal drug policies: their relationship to Pharmacoepidemiology	Reference 2, 3 & 4	
3	4	3. National medicinal drug policies: their relationship to Pharmacoepidemiology..... 3. Premarketing applications of Pharmacoepidemiology	Reference 1&2	
4	4	2. Study Designs 4.1 Observational studies	Reference 2,3 & 4	
5	4	4.1.1 Descriptive studies	Reference 2,3 & 4	
6	4	4.1.2 Analytical studies	Reference 2,3 & 4	
7	4	4.2 Experimental studies 4.2.1 Randomized Clinical Trial (RCT)	Reference 2,3 & 4	

8	4	4.2.2 Community Intervention Trails (CITs) 4.3 Selection of study designs	Reference 2,3 & 4	
9	4	5. Drug Utilization 5.1 Definition 5.2 Drug-centered and patient-centered approach in drug use studies	Reference 2,3 & 4	
10	4	5.3 Indicator based approach in drug use studies 5.3.1 Prescribing indicators 5.3.2 Patient care indicators 5.3.3 Facility specific indicators	Reference 2,3 & 4	
11	4	5.4 The social aspects of drug use	Reference 2,3 & 4	
12	4	5.5 The economic aspects of drug use	Reference 1,2,3 & 4	
13		5.6 Studies of patient compliance	Reference 1,2,3 & 4	
14	4	6 Pharmacovigilance 6.2 What is pharmacovigilance?	Reference 2,3 & 4	
15		6.3 Pharmacovigilance methods	Reference 1,2,3 & 4	
16	4	6.4 The need for effective drug safety programs 6.4 Elements of drug safety programs	Reference 1,2 & 3	

**Mode of delivery:**

- Illustrated Lectures and case studies
- Active learning methods (brain storming, buzz group, discussion, etc)
- Individual and group exercises and assignments
- Presentations and participation in class discussion
- Case studies

**Mode of assessment:**

- Quizzes and tests: 30%
- Attendance : 5%
- Case studies:5%
- Assignments (group or individual):20%
- Written final exam: 40%

**LEARNING MATERIALS:**

- Recommended Readings:
  1. Pharmacoepidemiology, 4<sup>th</sup> edition, Storm B. L. (Ed), John Wiley and Sons Ltd, England, 2005.
  2. Textbook of Pharmacoepidemiology, Storm B. L. And Kimmel S.E. (Eds), 2007, John Wiley, New Jersey.
  3. Pharmacoepidemiology – An Introduction, 3<sup>rd</sup> edition, Hartzema A.G., Porta M., Tilson H.H., (Eds), 1998, Cincinnati OH, Harvey Witney Books Company.
  4. Remington's: The Science and Practice of Pharmacy, 21<sup>st</sup> edition, University of The Sciences in Philadelphia, 2005, USA.

**Module name:** Professional electives

**Module Number in which the course exists:** 25

**Course title:** Photochemistry

**Course code:** Phar4252

**Course ECTS:** 5

A course guide for Phytochemistry course

Year/ semester:	Year IV, Semester II Regular B. Pharm
Pre-requisite:	Pharmacognosy
Status of the course:	Elective
Course description:	The course covers some selected topics in phytochemistry. Classes of phytochemistry along with their extraction and isolation methods.
Course objective:	By the end of this course students will be able to describe the scientific methods in the investigations of phytochemilas. Moreover, students can able to aquire the application of phytochemistry in the health care.
Delivery mode/ methodology:	During this course the following mode of teaching can be used: <ul style="list-style-type: none"><li>• Illustrated lectures</li><li>• Brain storming</li><li>• Buzz group</li><li>• Gapped lecture</li><li>• Questions and answers</li><li>• Self reflection</li><li>• Individual and group exercise and assignments</li><li>• Group discussions</li><li>• Seminar presentation</li></ul>
Assessment mechanisms:	Formative assessment <ul style="list-style-type: none"><li>• Participation</li><li>• Question and answer</li><li>• Pair work</li><li>• Peer assessment</li><li>• Self assessment</li><li>• Quizzes</li><li>• Performance on buzz group</li><li>• Self- reflection</li></ul> Summative assessment <ul style="list-style-type: none"><li>• Test/s.....20%</li><li>• Seminar presentation and paper work..... 20%</li><li>• Report (lab visit, garden and TM clinic)----- 20%</li></ul>



	<ul style="list-style-type: none"> <li>• Final exam.....40%</li> </ul>
Grading	As per the university's regulation
Teaching aids:	<ul style="list-style-type: none"> <li>• Smart board</li> <li>• LCD</li> <li>• Laptop</li> <li>• Black board &amp; chalk/white board &amp; marker</li> </ul>
Course policies:	<p>Ground rules:</p> <ul style="list-style-type: none"> <li>• Students are expected to attend all classes and consideration pertaining to class room attendance is as per the senate legislation of the university.</li> <li>• Active participation is required at most</li> <li>• Punctuality in class and assignment is mandatory</li> <li>• Misbehaving at class is highly forbidden</li> <li>• Disabling a cellular phone is a must</li> <li>• The students should submit the assignments and presentation manuals before the deadline.</li> <li>• The students should actively participate in group discussions which by itself is part of the student evaluation.</li> </ul> <p>Late work</p> <ul style="list-style-type: none"> <li>• Late assignments/homework will be penalized depending on circumstances.</li> <li>• Make up exam should be performed within reasonable time of absente per college policy and provide with required documents.</li> </ul> <p>Academic dishonesty policy/plagiarism</p> <ul style="list-style-type: none"> <li>• Academic dishonesty includes , but is not limited to, cheating, plagiarizing, fabricating of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. Students found in violation of such policy are subjected to disciplinary actions as per c policy.</li> </ul> <p>Disclaimer</p> <ul style="list-style-type: none"> <li>• This syllabus represent a best plan for the course, but, as with most plans, it is subject to changes made necessary by time, space and personal constraints as the course progresses.</li> </ul>
References :	<p>Your reading materials for the course:</p> <ol style="list-style-type: none"> <li>1. Sarker D, Latif Z, Gray A. Methods in Biothechnology Natural Products Isolation, 2<sup>nd</sup> edition, Human Press, Totowa, New Jersey, 2006.</li> <li>2. Dewick PM. Medicinal Natural Products: A biosynthetic Approach, 3<sup>rd</sup> edition. Jhon Wiley and Sons, LTD, England 2009.</li> <li>3. Bruneton, J. Pharmacognosy, phytochemistry, medicinal plants</li> </ol>

□ 4. Monika Waksmundzka-Hajnos, Joseph Sherma, Teresa Kowalska (2008).  
Thin Layer Chromatography in Phytochemistry. CRC Press  
Taylor & Francis Group

#### Course schedule

Week	Topic to be covered	Time
1.	2. General introduction about phytochemistry 2.1. Biological activity of phytochemicals 2.2. Major Classes of phytochemicals	4 hr
2- 3	3. Major secondary metabolic pathway <ul style="list-style-type: none"> <li>○ The acetate pathway</li> <li>○ The shikimate pathway</li> <li>○ The mevalonate pathway</li> </ul>	4 hr
4 -7	4. Steps in phytochemical screening <ul style="list-style-type: none"> <li>➤ Selection and collection of plant materials</li> <li>➤ Initial and bulk extraction methods</li> <li>➤ Preliminary phytochemical screening</li> <li>➤ Bioassay methods for phytochemicals <ul style="list-style-type: none"> <li>• <i>In vitro</i> evaluation (Anti-microbial evaluation methods, Anti-oxidant evaluation methods)</li> <li>• <i>In vivo</i> evaluation (Anti-malarial evaluation methods, Anti-diabetic evaluation methods)</li> </ul> </li> <li>➤ Isolation techniques</li> <li>➤ Structural elucidations</li> </ul>	12 hr
8-10	5. Extraction and Isolation of Plant Secondary Metabolites <ul style="list-style-type: none"> <li>5.1. General extraction and Isolation methods for alkaloidal extracts from crude plant material</li> <li>5.2. General extraction and Isolation methods to obtain saponin from plants</li> <li>5.3. General extraction and Isolation methods to obtain Flavonoids from plants</li> <li>5.4. General extraction and Isolation methods to obtain tannins from plants</li> <li>5.5. General extraction and Isolation methods to obtain volatile oils from plants</li> </ul>	8
11	6. Marine origin Natural Products	4 hr
12 - 14	7. Laboratory demonstration <ul style="list-style-type: none"> <li>➤ Extraction (simple maceration, steam distillation)</li> </ul>	9 hr

	<ul style="list-style-type: none"> <li>➤ Evaporation techniques (Oven, Rotary vapor)</li> <li>➤ Isolation techniques (Types of TLC, TLC jar, sample preparation and spotting, Column chromatography, Column packing, Silica gel, Alumina), HPLC</li> </ul>	
14 - 15	<ul style="list-style-type: none"> <li>➤ Visit to small medicinal plant garden (Identification of medicinal plants and their medicinal values)</li> <li>Visit to Traditional Medicine clinic</li> </ul>	6 hr
16	<p>Seminar presentation</p> <ol style="list-style-type: none"> <li>1. Nutraceuticals and their roles in health and disease prevention</li> <li>2. Cytotoxic and carcinogenic compounds of plant origin</li> <li>3. Some selected Ethiopian herbal medicine and their drug-herb interaction</li> </ol>	3 hr

**Course Name:** Pharmaceutical Manufacturing (Elective)

**Course code:** Phar4253

**Module Name:** Professional Elective Module

**Module Code:** 25

**Course ECTS:** 5

**Totally required hours for the course: 135hrs**

**Lecture hours:** 48

**Study hours:** 42

**Field visit:** 15

**Project work:** 20

**Presentation(s):** 10

**Year/Semester Course is offered:** IV/II

**Course prerequisite/s:** Pharmaceutical Technology Module

**Course Description:**

This elective course is designed to prepare graduate pharmacists towards the practical aspects of manufacturing of dosage forms with particular emphasis on formulation, processing and regulatory affairs. The course also introduces some advanced/novel drug delivery systems.

**Course Objectives:**

After completion of this course students will be able to:

- Select appropriate pharmaceutical excipients for a specific dosage form
- Apply principles and techniques of aseptic processing in sterile pharmaceutical manufacturing
- Prepare different sterile and non-sterile preparation at hospital settings
- Understand the regulatory affairs related with product manufacturing and marketing
- Describe some advanced/novel drug delivery systems

**Course mode of delivery:** Block

**Course learning and teaching methods:**

- Illustrated lectures and discussions, student research project, field trip, individual and group exercises and assignments presentation, guided reading

**Assessment techniques:**

- Group and assignments:10%

- Journal club: 10%
- Tests: 15%
- Quizzes: 15%
- Seminar presentation: 10%
- Final Exam: 40%

## **Teachers' and students' role**

### **Roles of Instructors**

#### **The instructor will be expected to:**

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments & presentations of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist in a field trip,
- Assist students with learning difficulties

### **Roles of Students**

#### **Students are expected to:**

- Engage in learning by doing (independent study, group works/exercises, etc.)
- Be active learners (participate effectively in group assignments, class activities/presentations, field study etc.);
- Attend classes regularly (Both theory, field study and presentations)

## References:

1. The Theory and Practice of Industrial Pharmacy, L. Lachman, H. A. Liberman and J. L. Kanig, 4th ed., Lea & Febiger, Philadelphia, 2015.
2. Handbook of Pharmaceutical Excipients: The American Pharmaceutical Association and the Pharmaceutical Society of Great Britain, Washington DC and London, 1986.
3. M. E. Aulton, Pharmaceutics: the science of dosage form design, 7th ed., Churchill Livingstone, Edinburgh.
4. Pharmaceutical Manufacturing Handbook: Production and Processes, S. C. Gad, John Wiley & Sons, Inc., Hoboken, New Jersey, 2008.
5. Pharmaceutical Manufacturing Handbook: Regulations and Quality, S. C. Gad, John Wiley & Sons, Inc., Hoboken, New Jersey, 2008.
6. Excipient Development for Pharmaceutical, Biotechnology, and Drug Delivery Systems, A. Katdare, and M. V. Chaubal, Informa Healthcare USA, Inc, New York, 2006.
7. WHO Guidelines: GMP

## Course Schedule

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments
1	4	<b>Pharmaceutical Excipients</b> <ul style="list-style-type: none"><li>○ Definition and goals (why excipients?)</li><li>○ Type of pharmaceutical excipients</li></ul> <b>Excipients for solid dosage forms</b> <ul style="list-style-type: none"><li>○ Desirable characteristics</li><li>○ Diluents, directly compression fillers, granulating agent (binder), disintegrant, lubricant/glidant/antiadherent, coating excipients (polymers, colorants, opaquants, polishing agents)</li></ul> <b>Excipients for liquid/semisolids dosage forms</b> <ul style="list-style-type: none"><li>○ Desirable characteristics</li></ul>

		<ul style="list-style-type: none"> <li>○ Solvents/vehicles, cosolvents, solubilizers, preservatives, antioxidants, chelating agents, suspending agents, wetting agents, surfactants, viscosity modifying agents, emulsifying agents, buffers, tonicity agents, sweeteners/ flavors, coloring agents, ointment base, emollients, gelling agents, suppository bases and others</li> <li>● Drug - Excipient Compatibility</li> </ul>
2	4	<p><b>Manufacturing of Sterile Pharmaceuticals</b></p> <ul style="list-style-type: none"> <li>● Introduction</li> <li>● Sterile pharmaceutical products: types and formulation aspects</li> <li>● Aseptic Processing <ul style="list-style-type: none"> <li>○ Facility design, GMP requirements and process flow, Clean room: design and qualification standards, HVAC systems, Principles of aseptic processing and media fill, environment and personnel monitoring</li> </ul> </li> <li>● Quiz</li> </ul>
3	4	<p><b>Manufacturing of Sterile Pharmaceuticals (Continued...)</b></p> <ul style="list-style-type: none"> <li>● Production Activities <ul style="list-style-type: none"> <li>○ Water treatment, Material and component entry, Cleaning and preparation, Compounding, Filling and Stoppering/Crimping/Sealing</li> </ul> </li> <li>● Terminal Sterilization/Depyrogenation <ul style="list-style-type: none"> <li>○ Techniques for sterilization (Thermal methods: steam sterilization, dry heat sterilization, Chemical sterilization: gas sterilization, other methods: radiation sterilization, sterilization by filtration)</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>○ Techniques for depyrogenation (Acid base hydrolysis, oxidation, alkylation, thermal and ionization radiation depyrogenation)</li> <li>● Quality Control Tests <ul style="list-style-type: none"> <li>○ Particle size and clarity test, pH and osmolality test, sterility test, pyrogen test</li> </ul> </li> </ul>
4	3	<ul style="list-style-type: none"> <li>● Hospital Manufacturing <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Water treatment</li> </ul> </li> </ul>
5		<ul style="list-style-type: none"> <li>● Test I</li> </ul>
6	3	<ul style="list-style-type: none"> <li>● Hospital Manufacturing (Continued...) <ul style="list-style-type: none"> <li>○ Sterile and non-sterile preparations (TPN, radiopharmaceuticals,</li> </ul> </li> <li>● Quiz</li> </ul>
7	4	<ul style="list-style-type: none"> <li>● Good Manufacturing Practices and Validation <ul style="list-style-type: none"> <li>○ Good Manufacturing Practices <ul style="list-style-type: none"> <li>▪ Basic principles</li> <li>▪ Quality management</li> <li>▪ Sanitation and hygiene, premises, equipment, material, personnel, product, QC, compliant handling and product recall, documentation</li> <li>▪ Heating Ventilation and Air Conditioning (HVAC) system</li> </ul> </li> </ul> </li> </ul>
8	4	<ul style="list-style-type: none"> <li>● Good Manufacturing Practices and Validation (Continued...) <ul style="list-style-type: none"> <li>○ Validation and Qualification <ul style="list-style-type: none"> <li>▪ Introduction, Regulatory basis (principle)</li> <li>▪ Validation and QA, Process validation (Prospective, concurrent and retrospective</li> </ul> </li> </ul> </li> </ul>



		validation), Cleaning Validation, Sterilization validation, Analytical method validation, Revalidation,
9	2	<ul style="list-style-type: none"> <li>• Good Manufacturing Practices and Validation (Continued...) <ul style="list-style-type: none"> <li>○ Validation and Qualification (Continued...) <ul style="list-style-type: none"> <li>▪ Facility and equipment qualification (DQ, IQ, OQ and PQ), Change control</li> </ul> </li> </ul> </li> </ul>
10		<ul style="list-style-type: none"> <li>• Test II</li> <li>• Assignment</li> </ul>
11	4	<ul style="list-style-type: none"> <li>• Regulatory Affairs <ul style="list-style-type: none"> <li>○ General Guidance and Principle</li> <li>○ Pharmaceutical plant inspection</li> <li>○ Inspection for premises licensing, Inspection for GMP certification, Inspection of API plants</li> </ul> </li> </ul>
12	4	<ul style="list-style-type: none"> <li>• Regulatory Affairs (Continued...) <ul style="list-style-type: none"> <li>○ Registration/Marketing authorization of medicines</li> <li>○ General</li> <li>○ Administrative and Product Information (Application form, agency agreement etc), Dossier Overall Summary (DOS), Quality (Drug substance and drug product), Non-Clinical Study Reports (Pharmacology, Pharmacokinetics and Toxicology), Clinical Study Reports (Reports of biopharmaceutic study, BA, Comparative BA and BE, Invitro-Invivo Correlation, human pharmacokinetic study, human pharmacodynamic study, report of efficacy and safety studies, study of controlled clinical study)</li> </ul> </li> </ul>
13	4	<ul style="list-style-type: none"> <li>• Regulatory Affairs (Continued...)</li> </ul>

		<ul style="list-style-type: none"> <li>○ Quality Control Testing</li> <li>○ Inspection and Post Marketing Surveillance</li> <li>○ Bioequivalence and Product Interchangeability</li> <li>○ Principles of interchangeability testing, Design of BE studies, Selection of comparators</li> <li>○ Basic statistical and analytical considerations, Regulatory requirements for bioequivalence and existing guidelines, Presentation of BE data in product dossier, BE study assessment - practical issues</li> </ul>
14	4	<ul style="list-style-type: none"> <li>● Advanced Pharmaceutical Dosage Forms <ul style="list-style-type: none"> <li>○ Microencapsulation</li> <li>○ Liposomes and micelles, nanoparticles, hydrogel based drug delivery, Introduction to novel drug delivery systems: overview, classifications and structure, physicochemical properties and applications</li> </ul> </li> </ul>
15		<ul style="list-style-type: none"> <li>● Test III</li> </ul>
18		<b>FINAL EXAM</b>

## **Course syllabus Pharmacogenetics**

**Module name:** Professional electives

**Module Number in which the course exists:** 25

**Course title:** Pharmacogenetics

**Course code:** Phar 4254

**Module name:** Elective module

**Module code:** Phar-M4252

**Course ECTS:** 5 ECTS (135 hrs)

- Lecture: 48 hours
- Practical: 20 hours
- Tutorial: 24 hours
- Home study: 30 hours
- Assignment and presentation: 16 hours
- Assessment : 7 hours

**Year/Semester Course is offered:** Year IV Semester II

**Contact hours/ week:** 135- 40= 95 hours/ 16 weeks= 6 hours

**Pre-requisite:** Pharmacology I and II

### **Course Description:**

Pharmacogenetics is aimed at advancing knowledge of the genetic basis for variable drug response. The ultimate goal of offering this course is to enable students to understand and identify clinically significant variations to predict the right choice and dose of medications for individuals--“personalizing medicine” drugs with narrow therapeutic index and a large proportion of patients do not respond. The course starts by introducing the concepts of Pharmacogenetics, the scope and its application. It also describes an introduction about the human genome, genetic variations and genetic code. In addition the course tries to emphasize on the principles of Pharmacogenetics in relation to individualizing therapy and the techniques used in Pharmacogenetic studies. Pharmacogenetics of pharmacokinetics and Pharmacodynamics will also be discussed. Finally as pharmacogenomic advances allow for individualized drug therapies based on genotypic information, future directions in personalized medicine will be discussed with examples on Pharmacogenetic of Cardiovascular, Psychiatry, Infectious, hematology and Oncology.

### **Course Objectives**

To understand genetic factors underlying efficacy/toxicity of drug therapy; to assess the value of phenotyping/genotyping in guiding drug therapy of individual patients

### **Learning Objectives:**

Upon completion of this course, the student will be able to:-

- Explain the basic principles of human genetics and Pharmacogenetics with its application
- Apply the principles of molecular and cellular biology to explain the genetic basis of variability in drug response.
- Describe the various biochemical/molecular biology methods used to determine genotype and polymorphic variability.
- Discuss how genetic variability in genes encoding drug metabolizing enzymes, drug transporting proteins, and drug receptors (targets) can contribute to variability in drug disposition and action, leading to changes in pharmacokinetics, pharmacodynamics and clinical outcome.
- Apply pharmacogenomic concepts to a particular drug therapy to solve relevant problems in pharmaceutical care.
- Critically evaluate the current and future literature in the area of pharmacogenomics.

### **Course EtCTS: 5 (135 hours)**

- Lecture: 48 hours
- Tutorial: 16 hours
- Home study: 20 hours
- Presentation : 8

### **Course mode of delivery: Block/Parallel**

### **Course learning and teaching methods**

Active learning methods (brain storming, discussion, etc), Lecture, group and individual presentation, assignment, and Practical visit to Emergency care unit to see treatment of poisoned patients.

### **Assessment techniques:**

Continuous assessment & summative assessment

- Quiz (10%)
- Tests (20 %)
- Assignments (10 %)

- Presentations on practical visit (10 %)
- Final Exam (40%)

## **Teachers and Students Role**

### **Role of Instructor**

The instructor will be expected to:

- Facilitate students' individual and group activities
- Organize students' hospital visit, laboratory work, workshop practices (if any) and project work presentation(s) and discussion sessions
- Assess students' performances (written and oral presentations)
- Provide timely feedback orally and in writing
- Make follow-up on developments made
- Plan and implement students' consultation program

### **Role of Students**

Students are expected to:

- Attend sessions
- Carry out individual and group tasks
- Active participant
- Reflect on feedbacks and take actions
- Carry out reading assignment

## **References**

### **Required reading (text)**

1. Pharmacogenomics. Applications to Patient Care. American College Clinical Pharmacy, Kansas City, MO. 2004.

### **Recommended Reading**

2. Strachan T, Read AP. Human Molecular Genetics. 3rd ed. New York, NY: Garland Science; 2004.

3. Pharmacogenetics and Individualized Therapy. Ed. Maitland-van der Zee & Ann Daly; (2011).

**Course Schedule:** contact time, contents/topics & reading/reference materials for each topic

Week	Contact hrs	Topic/sub-topic/chapter/Assessment/Assignments	Reading materials
1	3	<b>1. Introduction</b> <ul style="list-style-type: none"> <li>➤ Definitions of pharmacogenetics and pharmacogenomics</li> <li>➤ History of pharmacogenetics and pharmacogenomics</li> <li>➤ Scope and application in the biomedical field</li> </ul>	A, B
2	3	<ul style="list-style-type: none"> <li>○ Introduction to human genome, evolving concepts of genes/locus.</li> <li>○ Introduction to genetic variation (Mechanism/cause of genetic and epigenetic variations, types of variants, SNPs, coding and cis/trans regulatory variants, insertion/deletions, copy number variants)</li> </ul>	A, B
3	3	<ul style="list-style-type: none"> <li>➤ The genetic code (Information flow in biological system, Replication processes, Transcription, Translation, Regulation of gene expression)</li> </ul>	A, B, C
4	3	<b>2. Principles of Pharmacogenetics</b> <ul style="list-style-type: none"> <li>○ Genetic diversity</li> <li>✓ Overview on sources of variability in drug disposition and response</li> </ul>	A, B
5	3	<ul style="list-style-type: none"> <li>✓ Individualization and optimizing drug therapy for phenotypes and genotypes.</li> <li>✓</li> </ul>	A, B
6	3	<ul style="list-style-type: none"> <li>✓ Clinical Implementation of Pharmacogenetics (PGx) and Dosing Guidelines</li> </ul>	A, B, C
7	3	<b>3. Pharmacogenetic techniques</b> <ul style="list-style-type: none"> <li>➤ Genotyping (DNA sequencing, , Microarrays, Polymerase chain reaction (PCR),</li> </ul>	A, B, C
8	3	<ul style="list-style-type: none"> <li>➤ SNP Identification (RFLP techniques, Allele specific amplifications, Blotting techniques, Gene cloning</li> <li>➤ Phenotyping</li> </ul>	A, B, C
9	3	<b>4. Pharmacogenetics of drug pharmacokinetic profile</b> <ul style="list-style-type: none"> <li>➤ Pharmacogenetics of drug metabolism and activation</li> <li>➤ Overview of CYP450 enzyme families</li> </ul>	
10	3	<ul style="list-style-type: none"> <li>✓ Pharmacogenetics of phase I drug metabolism</li> </ul>	A, B, C
11	3	<ul style="list-style-type: none"> <li>➤ Pharmacogenetics of phase I drug metabolism Con...</li> </ul>	A, B,C

12	3	<ul style="list-style-type: none"> <li>➤ Pharmacogenetics of phase I drug metabolism Con...</li> <li>➤ Pharmacogenetics of Phase II drug metabolism</li> </ul>	A, B,C
13	3	<ul style="list-style-type: none"> <li>➤ Pharmacogenetics of drug transporters</li> </ul>	A, B,C
14	3	<b>6. Pharmacogenetics of drug response</b> <ul style="list-style-type: none"> <li>➤ Pharmacogenetics of drug targets</li> </ul>	A, B,C
15	3	<ul style="list-style-type: none"> <li>➤ Pharmacogenetics of Cellular signaling pathways</li> </ul>	A, B, C
16	3	Pharmacogenetics in Drug Discovery and Drug Development	A, B, C
17	3	<b>5. Future Directions in Personalized Medicine</b> <ul style="list-style-type: none"> <li>✓ Pharmacogenetics: Cardiovascular Diseases (PGx guided dosing of statins, PGx guided dosing of Warfarin and Warfarin Pharmacogenetics PGx guided dosing of clopidogrel.</li> </ul>	A, B, C
18	3	<ul style="list-style-type: none"> <li>✓ Pharmacogenetics: Central Nervous System and Psychiatry (PGx guided dosing of antidepressant and antipsychotic therapy. *PGx guided dosing in pain management.</li> <li>✓ Pediatric Pharmacogenomics (Variants affecting common drugs used in children and special considerations of genetics in this population (e.g ADHD, PPIs, codeine, asthma)</li> <li>✓ Genetic Counseling (Counseling on genetic findings, tools to assist in counseling, how to explain genetic and genetic variation to patients, disease risk vs pharmacogenomic variants )</li> </ul>	B, D
19	3	<ul style="list-style-type: none"> <li>✓ Pharmacogenetics: Transplantation (<b>Presentation</b>)</li> <li>✓ Pharmacogenetics: Oncology and Hematology (PGx guided dosing of anticancer agents) (<b>Presentation</b>)</li> </ul>	
20		<b>FINAL EXAM</b>	





**Module name:** Professional electives

**Module Number in which the course exists:** 25

**Course title:** Pharmaceutical Quality Control and Quality Assurance

**Course code:** Phar4255

**Course EtCTS:** 5

**EtCTS credits:** 5 (This course needs a total of  $5 \times 27 = 135$  working hours to spend in each teaching and learning as well as assessment activities). The distribution of these hours will be as follows

- Lectures =48 hours
- Assignment (group and individual) =10 hours
- Practical/laboratory sessions: 16hrs
- Home based study=31 hours
- Group discussion and presentation=10 hours
- Tutorial=10 hours

Pre-requisite if any: Pharmaceutical Analysis I & II

**Course description:**

The course deals with different quality aspects of pharmaceutical products starting from their production to consumption by the customers. The course mainly covers areas of GMP and different quality control measures taken after the drug is released to market.

**Course objectives:**

At the end of the course, the student will be able to:

- ✓ Describe the concepts and philosophies of TQM AND GMP
- ✓ Explain the different manufactures and controls taken on dosage forms
- ✓ Describe good laboratory practice and standard operating procedures
- ✓ Describe the major concepts of packaging and labeling of pharmaceuticals

**References:**

1. Quality Assurance Guide by Organisation of Pharmaceutical products of Ethiopia.
2. Good Laboratory Practice Regulations, 2nd Edition, Sandy Weinberg, Vo. 69, DeckerSeries
3. Quality Assurance of Pharmaceuticals – A compendium of guidelines and related materials – Vol. I – WHO Publications

4. A guide to Total Quality Management – Kaushik Maitra and Sedhan K.Ghosh.
5. How to practice GMPs – P. P. Sharma
6. ISO 9000 and Total Quality Management – Sadhank. G. Ghosh.
7. The International Pharmacopoeia Vol. 1,2,3,4 - 3rd Edition, General Methods of Analysis and Quality specification for Pharmaceutical Substances, Excipients and Dosage forms

**Schedule of chapters/topics/subtopics, allotted time and reference materials for each topic**

<b>Week</b>	<b>Chapters and topics/subtopics</b>	<b>Time allotted (hrs)</b>
1	<b>Chapter One:</b> Introduction to pharmaceutical regulation World, Africa, Ethiopia)	4
1	<b>Chapter Two:</b> Drug registration Process, Import and Export permit in Ethiopia Pharmaceutical establishments ; Brief over view about Setting and minimum quality requirments for a pharmacy, whole sale, import, small scale compounding and manufacturing, Pharmaceutical industry	4
2	<b>Chapter three:</b> Concepts and Philosophy of TQM, GMP (orange guide) and ISO-90004	4
3	<b>Chapter four:</b> Organization and personnel responsibilities, training, hygiene	4
	Chapter Five: Premises	4
	Location, Design, Plan Layout, Construction, Maintenance and Sanitations.	
3	Environmental control, Sterile areas, control of contamination	4

	<b>Chapter six: Equipments :</b>	
	Selection, purchase specifications, maintenance, sterilization of an area (TP & STP)	
4	Selection, purchase specifications, maintenance, sterilization of an area (TP & STP)	4
	<b>Chapter seven: Raw Materials :</b>	
	Purchase specifications, Maintenance of stores, Selection of vendors, Controls on Rawmaterials	
	<b>Chapter eight: Manufacture and controls on dosage forms</b>	
	Manufacturing Documents, Master Formula, Batch Formula	
5	Records, Standard operating procedure, Quality audits of manufacturing processes and facilities	4
	<b>Chapter Nine:</b>	
	Standard operating procedures for various operations like cleaning, filling, drying,compression, coating, disinfection, sterilisation, membrane filtration	
6	Standard operating procedures for various operations like cleaning, filling, drying,compression, coating, disinfection, sterilisation, membrane filtration	4
	<b>Chapter Ten: Packaging and labeling controls</b>	
	Line clearance, reconciliation of labels; cartons and other packaging material; types and tests assuring quality of glass.	
7	Types of plastics used, permeation, leaching, sorption, chemical reactions, biological tests, modification of plastics by drugs;	4
	Different types of closures and closure liners; film wrapper; Blisterpacks, Bubble packs, shrink handling; foil / plastic	

	pouches, bottle seals, tape seals, breakable seals and sealed tubes;	
8	Quality control of packaging material and filling equipment	4
	<b>Chapter Eleven: Quality control Laboratory :</b>	
	Responsibilities, Good Laboratory Practices, Routine controls, Instruments, Protocols, Non-clinical testing	
8	Controls on animal house, Application of Computers in Quality control laboratory.	4
	<b>Chapter Twelve:</b> Finished product release :	
	Quality review, Quality audits, Batch release document	
9-10	Quality review, Quality audits, Batch release document	4
	<b>Chapter Thirteen:</b> Warehousing :	
	Good warehousing practice, Materials, Managements.	
	<b>Chapter Fourteen:</b>	
	Waste disposal, Scrap disposal procedure and records.	4
11	Waste disposal, Scrap disposal procedure and records.	4
	<b>Chapter Fifteen:</b>	
	Regulatory aspects of Pharmaceuticals and Bulk drug Manufacturing Regulatory drug analysis	
12	<b>Chapter Sixteen:</b> WHO Certification, Globalisation of Drug Industry, Introduction to Export of Drugs and Import Policy	4
13	Chapter Seventeen: Harmonization process in pharmaceuticals and over view	4
14	Chapter Eighteen: <b>Good Documentation Practice</b>	<b>4</b>
15	<b>Pharmaceutical waste and its handling process, Regulatory requirements</b>	<b>4</b>



**Delivery mode/methodology:**

- ✓ Active learning methods (brain storming, group discussions, etc),
- ✓ Lecture,
- ✓ group and individual presentation,
- ✓ assignment
- ✓ Laboratory practice

**Assessment mechanisms:**

Continuous assessment & summative assessment

- Quiz (10%)
- Tests (10%)
- Assignments (15%)
- Presentation (10%)
- Lab reports and exam (20%)
- Final Exam (35%)

## **Drug Design and Synthesis (Phar4256) (Elective)**

### **Course Title: Drug Design and Synthesis**

**Prerequisite:** - Organic Chemistry, Medicinal Chemistry I and II

**Course description:** Drug design and synthesis is one of professional elective course of Pharmacy students that covers laboratory safety rules, drug discovery, drug development drug synthesis and drug designing methods, lead identification and modifications, stereochemistry, chemical reactions and different drug design techniques. In addition, this course will study about the process of drug delivery and phases in drug discovery and development. Moreover, this course covers the synthesis of different class of drugs and structure characterization using different spectroscopic techniques.

**Course Objective:** After completion of this course, students will be able to understand drug discovery, development, designing, drug targets and synthesis of various class of drugs that act on different systems and organs of the body.

### ***Teaching Methods:***

Total hours 114hrs

Lecture 48 hrs

Seminar 12 hrs

Reading assignment 54 hrs

### ***Assessment methods***

Assignments (20%)

Seminar (20%)

Written Examination (Tests 30%; Final Exam 30%)

## Course Content

- 1. Safety in Medicinal Chemistry Laboratory.....2hrs**
- 2. Introduction to Drug Discovery and Development.....8hrs**
  - 2.1. History of drug discovery
  - 2.2. Strategies in drug discovery, lead discovery, pharmacophore identification, lead development, Bioassays, screening of compounds
  - 2.3. Definition of terms (drug discovery, drug design, development and synthesis....)
  - 2.4. Pharmacokinetics and Pharmacodynamics of drug action
  - 2.5. Pre-clinical and Clinical Testing
  - 2.6. Stages in Drug Discovery and Development
- 3. Drug targets (Membrane Proteins, DNA, RNA, Enzymes) .....2hrs**
- 4. Lead Identification and Modification..... 2hrs**
  - 4.1. Lead Identification and High Throughput Screening
  - 4.2. Lead Identification and Modification Practical
- 5. Fundamentals of Rational Design..... 6hrs**
  - 5.1. Structure-Activity Relationships and Elements of Structure-Activity Relationship
  - 5.2. Quantitative Structure-Activity Relationships
- 6. Computer-Aided Drug Design (CADD)..... 8hrs**
  - 6.1. Molecular Modeling (MD)
  - 6.2. Ligand-Based Drug Design (LBDD)
  - 6.3. Structure Determination
  - 6.4. Structure-Based Drug Design (SBDD)
- 7. Drug Delivery..... 4hrs**
  - 7.1. Bioavailability
  - 7.2. Pro-drugs and Drug Delivery
- 8. Drug Synthesis Approaches.....4hrs**
  - 8.1. The Synthon approaches
  - 8.2. The Retro approach
  - 8.3. Synthesis of Some Common Drugs
- 9. Common Reactions in Medicinal Chemistry..... 8hrs**
  - 9.1. Amide Formation Reactions

- 9.2. S<sub>N</sub> Ar Reactions
- 9.3. E1 and E2 Reactions
- 9.4. Boc Protection/ Deprotection Reactions
- 9.5. Ester Hydrolysis Reactions
- 9.6. Suzuki–Miyaura Coupling Reactions
- 10. Stereochemistry..... 4hrs**

### Reference Books

1. **Kristian Strømgaard** Textbook of Drug Design and Discovery, Fifth Edition CRC Press; (2016)
2. Rama Rao Nadendla (2005). Principles of Organic Medicinal Chemistry. New Age International (p) Limited, Publishers
3. Donald J. Abraham (Ed.). Burgers’s medicinal Chemistry and Drug Discovery, 2003, 6<sup>th</sup> edn., voll-6, wiley-interscience (USA)
4. Gareth Thomas (2003). Fundamentals of Medicinal Chemistry. John Wiley & Sons Ltd, University of Portsmouth, UK
5. Thomas, L.Lemeke and David, A. Williams. Principle of Medicinal Chemistry, 2002, 5<sup>th</sup> edn. A Lea and Febiger book, Williams and Wilkins
6. Strategies for Organic Drug Synthesis and Design by Daniel Lednicer. Hardcover Wiley-Interscience; 1<sup>st</sup> edition (1998)
7. King, F.D. Medicinal Chemistry, Principles and Practice. The Royal Society of Chemistry, 1997.



## **Introduction to Warehouse management course syllabus**

**Module name:** Professional elective

**Module Number in which the course exists:** 25

**Course title:** Introduction to Ware house management

**Course code:** Phar 4257

**Course EtCTS:** 5(This course needs a total of  $5 \times 27 = 135$  working hours to spend in each teaching and learning as well as assessment activities). The distribution of these hours will be as follows

- Lecture: 48 hours
- Project work: 14 hours
- Presentations=10 hours
- Case studies/journal club=10 hours
- Tutorial: 8 hours
- Home study: 38 hours
- Assessment=7 hours

Pre-requisite if any: Pharmaceutical supply chain management

### **Course Description**

This course aims to introduce the students to the fundamental nature of inventory from a financial, physical, forecasting, and operational standpoint. The ultimate goal of this course is to present immediately usable information in the areas of forecasting, physical control and layout, and problem recognition and resolution. The course materials should enable students to:

- Understand that modern practice discourages holding large quantities of inventory.
- Grasp the significance of controlling actual, on-hand inventory as both a physical object (shelf count) and as an intangible object (record count and monetary worth).
  - Understand the fundamental differences between finished goods inventories in the retail/distribution sectors and raw materials and work-in-process inventories found in the manufacturing environment.
- Understand basic formulas to calculate inventory quantities.
- Employ basic problem-solving techniques toward issue resolution

### **COURSE OBJECTIVES**

This course aims to help the supply chain professional to understand and apply four (4) major and significant aspects of inventory management: - Optimize Inventory Levels - Build an Inventory Management Plan - Design & Manage Warehouse Operations - Increase Accuracy, Traceability & Reduce Parts Variety Participants should be able to understand the financial impacts of inventory and the risks in both over and under holding of inventory - the management of inventory, including lead time management, demand planning and interfacing with other functional groups directly and

indirectly involved in inventory planning and operations. They should also be able to understand the importance of effective Warehouse Management in minimizing the cost associated with the storing, moving and transporting goods into and out of the warehouse storage locations; the importance of reconciled physical count balances and system records and most importantly, the efficient, fast, precise and perfectly-timed issuances of the right quality & quantity of stocks to its intended users.

<b>Week</b>	<b>Contact hrs</b>	<b>Topic/sub-topic/chapter</b>
1	4	2.1. Introduction – Review of the “Fundamentals” 1.1 What is Inventory Management - Working Capital Cycle 1.2 Why is Inventory Management important 1.3 Why keep Inventory 1.4 How much Inventory to Keep 1.5 The Financial Implications of Holding Inventory - Inventory Carrying Cost - Effect on Financial 1.6 The Cost of not holding enough Inventory 1.7 The Role of the Inventory Manager 1.8 Exercises / Practical Application to Workplace
2	4	2.Setting the Stage for Effective Inventory Management 2.1 Introduction to Effective Inventory Management 2.2 Inventory Management& the Supply Chain Strategy 2.3 Demand Forecasting 2.4 Lead time Management 2.5 Exercises / Practical Application to Work / Questions & Answers 2.6 Understanding SAP Fundamentals & Terminology
3	4	3.Inventory Planning 3.1 Introduction to Inventory Planning 3.2 Service Level Policies - OTIF 3.3 Inventory Categorization Techniques - ABC Analysis - Fast & Slow Moving, Excess, Obsolete & Defective Stocks 3.4 Traceability and Variety Reduction 3.5 Inventory Coding Systems 3.6 The Inventory Management Plan 3.7 Group Discussion / Practical Application to Work
4	4	4 – Inventory Operations 4.1 Introduction to Inventory Operations 4.2 Monitoring Movements - Inventory Accuracy 4.3 Measuring and Valuation of Inventory 4.4 Receipt & Issuance of Inventory 4.5 Systems to Replenish Inventory 4.6 How Much to Order – EOQ, 4.7 When to Place an Order – ROP, JIT 4.8 Exercises / Practical Application to Work
5	4	5 – Warehouse Planning & Systems

	5.1 Introduction to Warehouse Planning & Systems 5.2 Warehouse Location & Acquisition Options 5.3 Warehouse Design 5.4 Warehouse Layout 5.5 Materials Handling & Equipment 5.6 Warehouse Operations 5.7 Record Keeping & Communication 5.8 Perpetual Systems/Continuous Review Systems 5.9 International Quality Standards 5.10 Physical Inventory & Cycle Counting 5.11 Exercises / Practical Application to Work
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**Mode of delivery:**

- Illustrated Lectures and case studies
- Active learning methods (brain storming, buzz group, discussion, etc)
- Individual and group exercises and assignments
- Presentations and participation in class discussion
- Case studies

**Mode of assessment:**

- Quizzes and tests: 30%
- Attendance : 5%
- Case studies:5%
- Assignments (group or individual):20%
- Written final exam: 40%

**LEARNING MATERIALS:**

Ackerman, K.B. *Practical Handbook of Warehousing*. New York, NY: Van Nostrand Reinhold, 1993.

Albright, B. "Recession Impacts Supply Chain Markets: WMS Growth Slows; Transportation and Events Software Picks Up Speed." *Frontline Solutions* 3, no. 6 (2002): 10–12.

Bolten, E.F. *Managing Time and Space in the Modern Warehouse*. New York, NY: American Management Association, 1997.

Forger, G. "Leading Trends in Manufacturing, Warehousing & Distribution." *Modern Materials Handling* 59, no. 13 (December 2004): 38.

Friedman, D. "How to Select the Best Warehouse Management System." *Material Handling Management* 60, no. 1 (January 2005): 28–29.

Harrington, L.H. "How to Solve the Warehousing Puzzle." *Logistics Today* 44, no. 9 (September 2003): 32–38.

Johnson, J.R. "Warehousing's Crystal Ball." *Warehousing Management* 9, no. 6 (July 2002): 24–28.

"An Overview of Warehousing in North America—Market Size, Major 3PLs, Benchmarking Prices and Practices." *North America Warehousing Market Report 2004*. Stoughton, WI: Armstrong & Associates, Inc., 2004.

Singer, T. "Trends in Warehousing and Distribution." *Industrial Maintenance & Plant Operation* 65, no. 11 (November 2004): 12–18.

## **Research in pharmacology Course syllabus**

**Module title:** Elective

**Course code:** Phar-M4258

**Credit:** 5 ECTS

**Pre-requisite (s):** Pharmacology I and II, Clinical toxicology

**Co-requisite (s):** none

### **Course Description:**

This course is designed to enable students recognize research methodology including various methods used for evaluation of drugs acting on central nervous system, autonomic nervous system, cardiovascular system, gastrointestinal tract, blood, endocrine system, kidney and liver, screening for wound healing, and anti-microbial screening techniques. It also enables students evaluate structural activity relationships, perform acute, sub-acute and chronic toxicity studies and blinded and planned screening of molecules. It allows students describe laboratory animal science, *in-vivo* and *in-vitro* pharmacological experiments and bioinformatics. In addition it allows students demonstrate ability to provide animal care and comply with ethical considerations in animal experimentations. After successful completion of the course, the learners will be able to describe the processes of drug development and conduct actual tests using animal models to answer a research question.

### **Learning outcomes**

- Up on successful completion of this module, students will be able to:
- Explain the process of new drug development
- Describe experimental models of drug action evaluation for different pharmacological effects
- Analyze the structure activity relationship of biologically active compounds
- Execute preclinical toxicity studies
- Recognize different models of *in-vivo* and *in-vitro* pharmacological experiments
- Provide appropriate care for experimental animals
- Comply with ethics of animal experimentation
- Conduct pharmacological experiments in various models

### Course contents

1. Guideline for the care and use of animals
2. Common laboratory animals
3. Standard techniques (bleeding & IV injection, ventilation rate, intragastric administration, procedures for rendering animal unconscious, and chemical euthanasia)
4. Standard drugs and chemicals (physiological salt solutions, drugs and vehicles)
5. Basic equipments (recording of BP, contraction of isolated tissues)
6. Study on isolated muscle preparation
7. Quantitative study of agonists and antagonists on isolated preparation
8. Identification and estimation of biologically active substances
9. Assays on anesthetized animal preparations
10. Common evaluation techniques
  - Methods to induce experimental hypertension
  - Analgesic agents
  - Anti-inflammatory agents
  - Agents acting on GIT (Anti-ulcer, anti-secretory, those affecting intestinal motility)
  - Antifertility agents
  - Antidiuretic agents
  - Antitussive activity

- Antidiabetic activity
- Neuropharmacological agents

### **Teaching strategy/Methods**

- Illustrated and interactive lecture
- Collaborative learning through brainstorming, question and answer, and group discussion
- Classroom student presentation and discussion
- Audiovisual simulation and animation
- Laboratory demonstrations and practice

### **Assessment strategy**

Continues assessment shall be carried out

- Formative assessment:
  - Quizzes, Drills and class room inquiry
  - Peer assessment: comments on assignment presentation
- Summative assessment:
  - Continuous assessment (20)
  - Practical examination [30%]
  - Final examination [50%]

## Module 26 Pharmaceutical Research I

<b>Module Name:</b>	Pharmaceutical Research I
<b>Module Category:</b>	Core
<b>Module Code:</b>	Phar-M4261
<b>Module Number:</b>	26
<b>Module Weight:</b>	3 ECTS

### Courses:

Course name	Course code	ECTS
Research methods	Phar 4261	3

### Module description:

This module is intended to equip pharmacy students with a basic working knowledge of pharmaceutical research methods. It also gives the trainee an acquaintance with research proposal writing, critical appraisal of scientific paper and application of common statistical packages. The module includes hands on research experience in the form of a directed studies course, which offers the student to perform research which culminates in the submission of substantial research work in the form of a senior essay/directed studies report paper.

### Module objective:

After successful completion of this Module the students will be able to:

1. Differentiate the major types of study designs
2. Identify the main issues in the design, conduct and presentation of a research
3. Explain the major elements that need to be examined when making a critical assessment of a research paper.
4. Demonstrate how to deal with each of these elements with reference to a published paper
5. Demonstrate a basic understanding of common statistical packages useful for data processing and analysis
6. Explain the major components of research in the pharmaceutical sciences
7. Prepare a research protocol and conduct pharmaceutical research

### Module competencies:

Upon a successful completion of this module, students will be able to conduct with minimal supervision by a senior pharmacist (researcher) research in the different areas of pharmacy practice and/or pharmaceutical sciences..

**Mode of delivery (Parallel/Block):** Block

### Module teaching/learning method:

Learning Activities

Students are expected to undertake among others the following major learning activities:

- Engage in learning by doing (independent study, group assignments, presentation, report writing, etc...)
- Participation and note takings during class lectures and debates and discussions;

- Reviewing the literature
- Data collection/conducting experiment (as appropriate), analyse results, report write-up and presentaiton

#### Teaching Methods

The course facilitator is expected to:

- Lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments, forming groups, encouraging students for peer learning
- Monitor student progress and provide feedback

#### **Module mode of assessment:**

- Quizzes
- Exam
- Assignments
- A directed studies report
- A directed studies presentation and defense



**Course Name:** Research Methods

**Course code:** Phar 4211

**Module Name:** Pharmaceutical Research

**Module Code:** Phar-M5211

**Course ECTS:** 3

**Totally required hours for the module:** 81

**Lecture hours:** 32

**Study hours:** 22

**Group work:** 4

**Project work:** 10

**Presentation(s):** 6

**Tutorial:** 4

**Assessment:** 3

**Year/Semester Course is offered:** Year IV Semester II

**Course prerequisite/s:** Epidemiology and biostatistics courses

**Course description:**

This module is intended to equip pharmacy students with a basic working knowledge and skills in the proper conduct of research in pharmacy practice and the pharmaceutical sciences. It also gives the trainee an acquaintance with research proposal writing, critical appraisal of scientific paper and application of common statistical packages.

**Course objective:**

After completion of this course students will be able to:

1. Differentiate the major types of study designs
2. Identify the main issues in the design, conduct and presentation of a research
3. Explain the major elements that need to be examined when making a critical assessment of a research paper.
4. Demonstrate how to deal with each of these elements with reference to a published paper
5. Demonstrate a basic understanding of common statistical packages useful for data processing and analysis
6. Explain the major components of research in the pharmaceutical sciences

**Course mode of delivery:** Block

**Course learning and teaching methods**

**Learning Activities**

Students are expected to undertake among others the following major learning activities:

- Engage in learning by doing (independent study, group assignments, presentation, report writing, etc...)
- Participation and note takings during class lectures and debates and discussions;

**Teaching Methods**

The course facilitator is expected to:

- Lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments, forming groups, encouraging students for peer learning

### Assessment techniques:

Formative / continuous and summative assessment

Assessment methods	Marks in %	Assessment time
Test 1	10	Week 2
Group work with presentation 1	5	Week 4
Test 2	10	Week 6
Assignment	10	Week 8
Test 3	10	Week 10
Group work with presentation 2	5	Week 12
Practice (proposal writing)	5	Week 13-15
Final	40	Week 16
Total	100%	

### Teachers' and students' role

#### Roles of Instructors

The instructor is expected to:

- Be a facilitator (introduce the subject; give guidance, moderate discussions, etc.)
- Read and comment assignments of students on time;
- Prepare his/her lessons and deliver lectures;
- Provide available and necessary reference materials;
- Encourage active participation of students in the teaching learning process;
- Assist students with learning difficulties;

#### Roles of Students

Students are expected to:

- Engage in learning by doing (independent study, project work; group work, etc.)
- Be active learners (participate effectively in group assignments, make presentations, prepare and present seminars, write reports, etc.);

### References:

#### Required readings (Text)

#### Recommended readings

- Degu G. and Tessema F. Biostatistics for health science students, Lecture Note series Universty of Gondar. 2005.
- Kebede Y, Weldemichael K, Lulu K. Lectre note of epidemiology for health sciences. 2003.
- Degu G, Yigzaw T. Research Methodology Lecture Notes for Health Sciences Students. University of Gondar. 2006.

- Training module on Health and Health Related Research proposal writing, module I. The Ethiopian Science and Technology Commission in Collaboration with RegionalState Health Bureaus, Nov. 2004.
- Training module on Health Research Methods, module II, ESTC in collaboration with RHBs & EPHA, November 2004.
- Training Module on Data Processing, Analysis and Interpretation for Health Research, module III, ESTC in collaboration I RHB & EPHA November 2004.
- Training module on Health Research Ethics , module IV , ESTC in coll. with RHBs and EPHA, November 2004
- Training Module on Communicating Research Findings: oral & written communication techniques. ESTC in coll. with EPHA and CDC - Ethiopia, Nov. 2004.

#### Course schedule\*

Week	Contact Hours	Topic/sub-topic/chapter/Assessments/Assignments	Reading Materials	Remark
1	4	2. Introduction to research methodology: definition, types and importance of research a. Study designs: i. Observational studies ii. Descriptive study design,		
2	4	iii. Analytic study design iv. Experimental study design o Randomized Clinical Trial (RCT) v. Community Intervention Trails (CITs)		
3	4	3. Sampling: definition, types & errors a. Sample size determination		
4	4	4. Types of data a. Methods of data collection b. Data processing, analysis and presentation		
5	4	5. Research proposal and report writing 6. Research in pharmaceutical sciences a. Experimental methodologies		
6	4	b. Experiments involving the use of in vitro systems c. Experiments involving the use of lab animal d. Experiments involving human beings		
7	4	e. Research Pharmacognosy f. Research in pharmaceutics g. Research in pharmacology		
8	4	h. Research in Pharmacotherapy 7. Data documentation		

## **Module 27 and 28: Pharmacy clerkship module I and II**

**Module name:** Pharmacy clerkship module

**Module category:** Core

**Module code:** Phar-M5271 and Phar-M5281

**Module Number:** 27 and 28

**Module weight in EtCTS:** = 22 and 20

**Prerequisite:** successful accomplishment of all core modules courses Year I – Year IV

**Courses:**

<b>Course name</b>	<b>Course code</b>	<b>ECTS</b>
Ambulatory care clerkship	Phar5271	<b>5 ECTS (3 wks)</b>
Drug information service clerkship	Phar5272	<b>3 ECTS (2 wks)</b>
Internal medicine clerkship	Phar5273	<b>7 ECTS (4 wks)</b>
Hospital pharmacy clerkship	Phar5274	<b>7 ECTS (4 wks)</b>
Pediatric clerkship	Phar5281	<b>7 ECTS (4 wks)</b>
Gynecology, obstetrics & family planning clerkship	Phar5282	<b>3 ECTS (2 wks)</b>
Pharmaceutical manufacturing clerkship	Phar5283	<b>5 ECTS (3 wks)</b>
Community pharmacy clerkship	Phar5284	<b>5 ECTS (3 wks)</b>

### **Module description:**

This year-based clerkship module provides students with a structured, supervised program of participation in the practice of clinical pharmacy. Students gain experience in problem solving and providing patient care services while applying the basic and applied pharmaceutical sciences learned in the didactic courses & practical laboratories. This module should also provide the means by which the students will extend their clinical knowledge and skills. It emphasizes problem solving in the everyday milieu of patient care with in a setting of integrated inter-disciplinary patient care.

### **Module objective:**

At the end of this module students will be able to:

- Processing prescriptions/medication orders
- Identifying and resolving drug related problems through patient information retrieval and assessment

- Development of patient specific Pharmacotherapy care plans
- Monitor drug therapy
- Communicate with patients and other health care providers
- Provide patient education and training
- Demonstrate drug and literature information retrieval, evaluation, application, and related verbal and written communication skills
- Develop a practical and functional understanding of pharmacy services/systems in different practice settings, to include related patient safety and management responsibilities
- Describe the traditional and innovative roles of pharmacy practitioners in a variety of practice settings
- Apply and further evolve knowledge and skills in practice environments.
- Formulate career direction and strategy, in conjunction with the efforts of the student's academic advisor and preceptors.

**Module competency:**

- Provide Pharmaceutical Care and ensure the optimal use of medicines by the patient;
- Provide pharmacist-initiated care to patients and ensure the optimal use of medicines;
- Provide training and information on health care and medicines;
- Promote community health and provide related information and advice; and
- Conduct research to ensure the optimal use of medicines.
- Be able to work with members of the health team.
- Maintain pharmacy ethical code of conduct
- Demonstrate respect and compassion to patients, to their relatives and other professions

**Mode of delivery:** Year based/Parallel

**Mode of Assessment:**

Daily activity at rotation site

Clinical pharmacy related presentation: patient case presentation, seminar

Portfolio preparation & submission

Journal club presentation

Internal and external oral exam

Written exam

## **Module learning teaching methods**

Case presentation/morning session, patient chart review, ward rounds, journal club & seminar, and project work, bedside teaching

### **Clerkship Title: Ambulatory Care Pharmacy Clerkship**

**Clerkship Code: Phar5271**

**Clerkship ECTS: 5 (3 weeks)**

**Pre-requisites: accomplishment of all didactic courses Year I – Year IV**

**Co-requisites: None**

### **Clerkship Description:**

Offered in a variety of ambulatory care settings to include outpatient specialist clinics including HIV/AIDS clinic, TB clinic, chronic illness clinic (e.g. cardiac, Hypertension, Diabetic and epilepsy clinic) and Chest Clinic, this experience emphasizes primary care using a case management approach with an out-patient population, to include: patient data collection, organization, and assessment; development of care plans that correspond to desired therapeutic objectives; patient monitoring, to include physical and laboratory assessment; communication with patients (and care givers) to acquire patient data, assess target outcomes and provide education and communication with prescribers, and other health care providers to optimize outcomes. Provision of preventive health education and screening services is expected in most settings.

### **Clerkship Objectives:**

The student's learning goal for this clerkship is to develop the essential skills necessary to provide patient- specific care to patients in the ambulatory care

- Evaluate pathophysiology, clinical presentation, treatment goals, drug therapy, monitoring parameters, outcome measures, prognosis, and long-term management of common medical conditions in the ambulatory care setting.
- Identify drug-related problems; formulate and implement patient-specific, evidence-based patient care plans, and follow up to determine patient progress.
- Succinctly and clearly present oral and written outlines of patient work-ups.
- Synthesize succinct, evidence-based answers to drug information questions posed by patients or health care colleagues.
- Evaluate patient understanding of provided information about medical conditions, drug therapy, outcome goals, potential side effects (and what to do if side effects occur), and other medication-related information.

- Demonstrate professional conduct and demeanor that is ethical and responsible displaying integrity, compassion, empathy, and respect.

**Mode of delivery:**

Case presentation/morning session, patient chart review, attending ambulatory care team, journal club presentation/project work and seminar

**Mode of assessment:**

i.	Case presentation	15%
ii.	Seminar with pretest	15%
iii.	Activities in OPD	20%
iv.	Portfolio	10%
v.	Internal oral exam	20%
vi.	Written exam	20%

**Task List for Ambulatory Care Pharmacy Practice Rotations**

A list of specific tasks has been established for each of the core rotations to serve as a guide to the minimum requirements necessary to demonstrate competency. Reasonable effort should be made to accomplish these tasks when possible.

- For all assigned patients, review the patient’s medical record and when possible conduct an interview. Evaluate current medication regimens and monitoring history. Be prepared to make therapeutic & monitoring recommendations. Be prepared to recommend & assess all new medication prescriptions.
- On selected patients, complete a detailed medication history. Assess achievement of treatment outcomes, ADRs, compliance etc. Make recommendations regarding drug therapy assessment and justify any proposed changes or interventions to preceptor or primary care provider.
- Assess and optimize doses for all applicable medications regarding renal function, pharmacokinetic evaluation of serum concentrations (if available) and other quantitative monitoring parameters (e.g. INR, blood glucose, etc): make dose or drug selection recommendations based on assessments.

- Prepare and present patients to preceptor (Pharmacotherapy Rounds): List patient problems, drug therapy, monitoring parameters, therapeutic end-points, dosage, potential ADRs and interactions. Discuss appropriateness of current and alternate medication therapies.
- Drug information: provide concise, up to date and evidence based drug information responses. Submit at least 4 written drug information responses given in the portfolio
- Submit 2 adverse drug events and 6 drug therapy problems/interventions identified during the rotation
- Submit 2 Pharmaceutical care services given during the rotation using 2-page SOAP format

**Clerkship Title: Drug Information Service Clerkship**

**Clerkship Code: Phar5272**

**Clerkship EtCTS: 3 (2 weeks)**

**Pre-requisites: accomplishment of all didactic courses Year I – Year IV**

**Co-requisites: none**

**Clerkship Description:**

- The Drug information service clerkship will be offered at Drug Information Centre and this experience emphasizes the use of drug literatures in the promotion of safe, effective and rational drug therapy. This clerkship provides students to develop the skills for retrieving, evaluating and communicating drug information to health care professionals and the patient.

**Clerkship Objectives:** At the end of the rotation in the Drug Information Centre students should be able to:

- Develop the capability to comfortably and confidently provide drug information to individuals and groups
- Demonstrate the ability to research drug information independently using multiple sources in a timely manner
- Develop a logical, step-wise approach to searching the drug information resources
- Develop critical decision-making skills relative to the selection, retrieval, and evaluation of appropriate literature resources

**Mode of delivery:** Journal Club/ Case presentation/morning session, patient education, attending drug information center, project work and seminar

**Mode of assessment:**

- Daily activities at drug information center 20%



- Portfolio preparation and submission (50%)
  - Newsletter 10%
  - Query request and response 20%
  - Poison information 10%
  - Monograph preparation 10%
- Presentation – literature appraisal (journal club) 10%
- Written Examination 20%

**Activities to be performed by students during the rotation**

- Receive drug information queries and fill each question on the Drug Information Centre (DIC) request form
- Provide concise, applicable, comprehensive, and timely responses to requests for drug information from patients, health care providers, and the public
  - Perform literature searches on Medline, International Pharmaceutical Abstracts, PubMed, Micromedex and related Databases
  - Identify potential evidence based solutions/answers to queries from literature;
  - Obtain Approval from the preceptor before communicating the requested information
  - Communicate the information professionally
  - Clearly express and justify their recommendation(s) in both written and oral forms
- Accurately document the drug information request
- There shall be a case presentation and discussion session twice per week in the afternoon.

The students will present a journal club on selected article in the area of drug information.

The student is expected to submit handouts for the journal club and a portfolio for filled drug information response provided during the clerkship.

**Clerkship Title: Internal Medicine Clerkship Rotation Syllabus****Clerkship Code: Phar5273****Clerkship EtCTS: 7 (4 weeks)****Pre-requisites: accomplishment of all didactic courses Year I – Year IV****Co-requisites: None****Clerkship Description:**

- Taking place on adult internal medicine services located in acute care sites including medical intensive care and adult emergency units, this experience emphasizes primary patient care using a case-management approach, to include: patient data collection, organization, and assessment; development of plans that respond to desired therapeutic plans; patient monitoring to include physical and laboratory assessment; communication with patients (and care givers) to acquire patient data, assess target outcomes, and provide education; communication with prescribers, and other health care providers, to seek clarification and provide observations and recommendations consistent with the care plan; and provision of drug information to health care professionals in the hospital.

**Clerkship Objectives**

Upon successful completion of the experiential in Internal Medicine inpatient care, the student will be able to:

- Demonstrate an understanding of the pharmacotherapy of the most common acute and chronic disease states encountered in the institutional setting
- Discuss disease management including pathophysiology and drug therapy as it relates to patient specific characteristics and disease states
- Review the mechanism of action, indications, contraindications, adverse effects, and drug-interactions for each of the patient's medications
- Identify laboratory tests necessary to diagnose and monitor various disease states, describing the usefulness and limitations of each test
- Describe how certain disease states affect laboratory values and how they alter the interpretation of these laboratory values
- Assess findings to determine real and potential pharmacotherapeutic problems, rank them in order of acuity; describes probable causes/effects, and gathers additional information to define/clarify the problems

- Demonstrate ability to perform discharge/follow-up medication teaching and/or instruct patients in medication education classes

#### Retrieve and interpret patient chart information

- Obtain a complete medical and surgical history (including family history)
- Obtain allergy status of the patient including drug, food, other (E.g. dye, latex) and types of reactions
- Obtain a complete medication history including prescribed medications, over the-counters, and complementary medications (herbals, supplements, etc.). Include dose, route of administration, and frequency of use. Document in the appropriate manner
- Obtain information regarding whether or not the patient administers his/her own medication(s) or if a caregiver shares this responsibility, and if compliance aids are utilized, needed or appropriate; document and report noncompliance issues to preceptor
- Obtain information regarding behavioral issues such as tobacco, alcohol, and illicit drug use, diet, and exercise
- Obtain information regarding the patient's use of services outside of the primary care setting, including mental health, chiropractic, acupuncture, etc.
- Obtain information regarding the patient's financial situation (e.g. prescription costs, insurance, eligibility for indigent care)
- Obtain most recent information from medical record including laboratory data, vital signs, physician's orders, and consult notes
- Identify drug-related problems from patient chart and document evidence of the problem
- Recognize the need for pharmacist intervention

#### Design a Pharmaceutical Care Plan

- Retrieve and interpret patient chart information
- Construct and maintain patient problem list
- Assess each problem on patient's problem list appropriately (i.e. need for therapy, current therapy, potential therapy)
- Apply the knowledge in pathophysiology and drug therapy to patient care situations

- Formulate recommendation plan for each problem on patient's problem list (i.e. recommended pharmacological and non-pharmacological therapy, drugs to be avoided, further tests, follow-up)
- Provide rational drug therapy recommendations based on information obtained from the patient interview, physical assessment/examination, laboratory data, medical record, etc.
- Design medication regimens that are convenient, affordable, and will produce optimal patient outcomes (e.g. side effect profile, dosage form, etc.)
- Perform prospective drug regimen reviews to evaluate contraindications and drug-drug and food-drug interactions utilizing knowledge of medicinal chemistry, biochemistry, pharmacokinetics, herbal/nutritional supplements/over-the-counter medicines
- Evaluate the primary literature and national treatment guidelines and its utility in meeting patient needs (including case reports, if appropriate) to make a reasonable decision based on available information
- Identify goals of therapy, including effects on quality of life (QOL)
- List and obtain monitoring parameters (i.e. toxic, therapeutic)
- Write clear and concise consultation notes or progress notes (e.g. SOAP notes)
- Communicate to patient, physician, and preceptor therapeutic plan both verbally and written as needed
- Complete and update the patient medication record and other pharmacy notes/documentation systems as needed
- Modify recommendations as needed

#### Provide drug information

- Describe the pharmacist's role in providing health care information within the Internal medicine setting
- Obtain necessary background information to accurately answer drug information questions
- Identify and utilize, both efficiently and effectively, appropriate drug information sources (including local Poison Information Center)
- Effectively retrieve and evaluate medical information for patients and health care providers
- Effectively evaluate, interpret, and summarize pharmaceutical and medical primary literature; recognize uses and limitations of different information resources

- Retrieve the standards of care/disease management protocols for various disease states (e.g. AHCPR, APhA, Chest, NHLBI, NCEP, JNCIV, FMHACCA etc.)
- Demonstrate effective communication skills, written and verbal, to preceptors, patients, physicians, and other health professionals
- Provide health care professionals with accurate, concise, and timely drug or drug therapy information
- Document and reference all drug information responses
- Identify, define, and report adverse drug reactions; reports to FMHCCA, and when appropriate, the P&T Committee and Board of Pharmacy
- Prepare a drug monograph for P & T Committee meeting
- Prepare a well-researched article for the institutional newsletter
- Prepare an in-service to the RPh/RN/MD staff.
- Prepare a drug utilization review/medication guideline/protocol

Describe intradepartmental and interdepartmental dynamics to the facility

- Participate interdisciplinary continuing education activities with other health care practitioners (e.g. grand rounds, clinical conferences, in-service lectures)
- Attend and participate in journal club using an article published in the primary literature when opportunities exist
- Visit other departments in the internal medicine setting involved in diagnosis and treatment (e.g. E.R., critical care units, radiology, laboratory, anesthesiology, O.R., respiratory therapy, etc.) and describe the basic responsibilities of the department, its drug use policies and process, and its relationship with pharmacy
- Describe the pharmacist role in various Internal medicine committees (e.g. P&T, infection control, nursing, and pharmacy). The student should be scheduled to attend a committee meeting when possible and participate in providing background information for the committee to review
- Describe the various means the pharmacy department seeks reimbursement for its distributive and cognitive services. The student should discuss the procedures to follow in the institution in justifying reimbursement for pharmaceutical care

Demonstrate professional attitude and conduct

- Exhibit neatness and professionalism in appearance and work
- Accept constructive criticism, demonstrate receptiveness to feedback
- Demonstrate dependability, punctuality, courteousness, and tactfulness when dealing with patients and members of the health care team
- Maintain professional and ethical standards- compliance with laws and regulations, good professional judgment, reliability, and credibility when dealing with colleagues, patients, and other health care professionals
- Display self-directed (independent) learning, conduct self-assessment, develop a personal learning plan, and pursue knowledge independently
- Demonstrate competency in organizing and planning, establish management skills, set meaningful and attainable goals and be consistently well prepared
- Maintain confidentiality
- Display a patient and empathetic attitude towards patients including appropriate body language showing genuine interest in the well-being of the patient
- Respond to assignments in a timely manner and is consistently on time and ready for work upon arrival, with no unexcused absences

### **Task List for internal medicine inpatient care Rotations**

A list of specific tasks has been established for each of the required rotations to serve as a guide to the minimum requirements necessary to demonstrate competency. Provided below are samples of a few of the tasks defined for each specific core experiential rotation. Reasonable effort should be made to accomplish these tasks when possible.)

- **Actively participate in rounds on a daily basis.** Attend conferences required of the medical team (e.g. Grand Rounds, Teaching Rounds, Case Conference, etc.).
- Discuss at least 2 therapeutic guidelines relevant to the acute care site's patient population.
- Assess all potential ADEs. Complete adverse drug events and medication error report as per national or school designed ADEs/medication error reporting form and guidelines.
- Develop/Document written Drug Information responses from preceptor, patients, caregivers or prescribers (4).
- Interface with pharmacy staff regarding unusual medication orders, patient issues, non-formulary needs, etc.

- Present patients to preceptor (and others) (Pharmacotherapy Rounds): List patient problems, drug therapy, monitoring parameters, therapeutic end-points, dosage, potential ADRs and interactions. Discuss appropriateness of current or alternate medication/doses and nutritional therapies.
- Assess and monitor applicable doses and medication therapy outcomes (including potential ADEs) in relation to renal function, pharmacokinetic analysis of serum concentrations and other lab or quantitative or clinical monitoring parameters, if available.
- Perform medication dosage form conversion on medications that are typically converted from intravenous to oral dosing whenever possible or prior to patient discharge. It also involves review of situations during which conversion is appropriate, benefits of such conversion, and appropriate conversion guidelines.
- Perform renal / hepatic dosing optimization for medications commonly used in the inpatient care depending on pertinent laboratory values
- Conduct at least 8 patient interview to obtain drug histories (refer to activities schedules for due dates)
- Write a 2 page (maximum) SOAP note. Three per 4 week rotation
- Submit 4 adverse drug events and 8 medication errors identified during the 4 week rotation. Submit timely projects and student portfolios assigned by the preceptor

**The following description further explains the core activities to be performed.**

**The student shall attend Conferences, Morning Report, Grand Rounds, and medical Resident's Conference. The student may attend other conference as determined by the preceptor.**

**Patient Care:**

1. Rounds: The student is expected to actively participate in rounds on a daily basis. Team members should feel free to ask the student questions and ask them to research drug-related issues within a reasonable time period. Any responses to drug information requests or recommendations should be made at this time unless it was more prudent to provide the information/recommendation earlier in the day. The student should document clinical interventions/drug information requests on the appropriate form.

2. **Patient Monitoring:** The student should be monitoring the drug therapy of all patients on their team at all times. A complete database on each patient should be kept. Students should obtain necessary patient data in the morning so patients can be reviewed with a preceptor in the afternoon.
3. **Drug Information Requests:** During the morning the student should work on any requests for drug information that they have received from the team. Responses should be reviewed with the preceptor during the afternoon meeting or earlier if information is needed by the team prior to that time.

### **Oral and Written Communication**

1. **Case Presentations:** Each day the student will informally present the patients currently assigned to their team.
2. **Written Drug Information:** If requested by the preceptor, the student will write a newsletter article or drug class summary. The preceptor will provide the student with a list of potential topics. The student may then choose the topic they would prefer to work on.
3. **Journal Club:** The student will review a recently published study that pertains to pediatric patients. The study will be presented at journal club. Attendees will include other pharmacy students, pharmacy faculty, and pharmacy staff members if available. The article should be approved by the preceptor. Please see the journal club information sheet for more details on choice of article and format for presentation format.

### **Mode of delivery:**

Case presentation/morning session, patient chart review, attending medical wards, bed side teaching, journal club presentation, project work and seminar

### **Mode of assessment:**

i.	Case presentation	15%
ii.	Seminar with pretest	15%
iii.	Ward activities	20%
iv.	Portfolio	10%
v.	Internal oral exam	20%



vi. Written exam

20%

**Clerkship Title: Hospital Pharmacy Clerkship**

**Clerkship Code: Phar5274**

**Clerkship EtCTS: 7 (4 weeks)**

**Pre-requisites: accomplishment of all didactic courses Year I – Year IV**

**Co-requisites: none**

**Clerkship Description:**

- Taking place in hospital-based pharmacy services, this experience emphasizes administrative and pharmacy service functions, to include: drug distribution and dispensing; D.U.E. [if any undergoing]; A.D.R. and Medication error reporting, formulary review and amendment [if any,]; cost containment outcome assessment; quality care assurance; inventory control; and maintenance of mandated hospital pharmacy records.
- The student Pharmacists are expected to provide hospital pharmacy Clerkship with integration to clinical pharmacy services in the above delivery sites.

**Rotation task list/activities for Hospital Pharmacy Rotations**

**One week will be dedicated for hospital pharmacy related supply chain management activities**

A list of specific tasks has been established for each of the required clerkships to serve as a guide to the minimum requirements necessary to demonstrate competency. Provided below are samples of a few of the tasks defined for each specific core clerkships [drug distribution system, dispensing...]. Reasonable effort should be made to accomplish these tasks when possible).

The student will spend two weeks in a hospital pharmacy department. The student will experience pharmacy operations and services relating to systems for medication distribution, medication use and drug control, management of the department, scope of clinical services provided by the department, and department relationships within the institution and health systems

- As frequently as possible, if any of the following present at time of attachment otherwise we expect the preceptor to brief each of the students on the following issues, attend clinical/operational meetings: Pharmacy and Therapeutics Committee (PTC), PTC subcommittees, Patient Safety, Pharmacy Staff, Nursing/Pharmacy and others as identified by preceptor.
- As frequently as possible, attend educational meetings: staff in-services, Grand Rounds, and others as identified by preceptor.
- Participate in basic administrative activities needed to maintain a hospital pharmacy department

- Involve in purchasing, inventory control, and basic fiscal procedures
- Participate in drug security, storage, and control procedures and quality assurance works
- Describe the policies and procedures for maintaining quality assurance using JCAHO and ASHP standards [ these are international benchmarks for hospital pharmacy services]
- Participate in the intradepartmental and interdepartmental continuous quality improvement process and importance of project teams, if any
- Read about the role of technology and alternative distribution systems as they relate to expanded clinical services
- Assess and evaluate the financial impact of drug therapy
- Evaluate drug therapy costs, including costs of drugs as well as monitoring costs
- Evaluate financial consideration of alternative therapies
- Design the various means the pharmacy department seeks reimbursement for its distributive and cognitive services. The student should discuss the impact of pharmaceutical care programs on the health of patients and how they impact the cost of care
- Students should be given reading assignment on the following issues – effective utilization of automation / informatics - an assigned activity that provides insight into the benefits & challenges of automation / informatics (e.g. CPOE, decision support, distribution, compounding, drug information retrieval, etc.
- Participate in the drug dispensing process related to providing meds for new orders and ongoing supply (unit dose etc.) in order to understand system flow and verification that meds dispensed are correctly prepared.
- Under the supervision of a pharmacist, process a broad variety of new medication orders. Processes to include: medication order assessment, order entry or order verification, evaluation and application of computer alerts, resolution of problems and over-sight of medication dispensing. Closely observe and simulate those processes from printed profile and demonstrate an understanding of workflow.
- [students should be given reading assignment on these areas since we don't have currently such system]- how to prepare a number and variety of sterile parenteral products sufficient to demonstrate acceptable competency. Syringe, small and large volume, etc. Participate in TPN and chemotherapy processing and preparation if feasible. Discuss both patient and environmental safety issues.

- Develop/discuss/document resolution of 5 patient profile reviews or new medication order problems.
- Prepare at least **20** medication orders for the patient by evaluating the medication order and selecting the proper product.
- Identify drug-related problems (minimum of 5) and document in the work book or portfolio.
- Package and dispense multiple dosage forms including IV admixtures as assigned by the preceptor.
- Communicate therapeutic recommendations to other health care professionals.
- Perform at least **15** pharmaceutical calculations related to the medication order, including pediatric orders.
- Develop concise, applicable, comprehensive, and timely responses to requests for drug information from other health care providers in the hospital setting.
- Participate in the health system's formulary process/drug monograph, if any
- Perform prospective and retrospective financial and clinical outcomes analyses to support formulary recommendations and therapeutic guideline development
- Understand the relationship between medication distribution and clinical pharmacy services, and identify barriers between the two components.

**Mode of delivery:** Case presentation/morning session, Patient Chart review, attending hospital Pharmacy, bed side teaching, Journal Club presentation, project work and seminar

**Mode of assessment:**

- |  |     |
|--|-----|
| • Attendance and on-site activities at hospital pharmacy by preceptors       | 15% |
| • Portfolio  | 20% |
| • Hospital pharmacy related presentation – journal club presentation/seminar | 15% |
| • Internal oral exam   | 25% |
| • Written Examination  | 25% |

**Clerkship Title: Pediatrics Clerkship Rotation Syllabus**

**Clerkship Code: Phar5281**

**Clerkship ECTS: 7 (4 weeks)**

**Pre-requisites:** accomplishment of all didactic and Laboratory based courses Year I – Year IV

**Co-requisites: None**

**Clerkship Description:**

- **The purpose of Pediatrics clerkship is to train student to provide pharmaceutical care to pediatric patients**

**Specific Goals**

- To provide the student with an understanding of pediatric patient care in the clinical setting.
- To develop a knowledge base of common pediatric disease states and their therapy.
- To learn to apply therapeutic and pharmacokinetic principles to the pediatric patient.
- To develop an appreciation of the pharmacist's role in monitoring drug therapy in the pediatric patients.
- To be able to evaluate the appropriateness of drug therapy in pediatric illnesses.
- To be able to interact with the pediatric care system as a participant.
- To develop an understanding of drug dosage and formulation problems unique to pediatric drug therapy.

**Clerkship Objectives:**

**After completing this rotation, the student will be able to:**

**Provide Direct Patient Care**

1. Collect and organize all patient-specific information needed to detect and resolve drug related problems and to make appropriate drug therapy decisions in pediatric patients
  - Identify the types of information needed to detect and resolve problems
  - Discuss signs and symptoms, epidemiology, risk factors, pathogenesis, pathophysiology, natural history of disease, clinical course, etiology, and treatment of common diseases in pediatric patients
  - Discuss the mechanism of action, pharmacokinetics, pharmacodynamics, usual regimen (dose, schedule, form, route, and method of administration), indications,

contraindications, interactions, adverse reactions, relative efficacies, and pharmacoeconomics of drugs used in pediatric patients

- Identify the differences that may occur in the pharmacokinetics and pharmacodynamics of drugs due to the developmental stage of a pediatric patient
2. Determine the presence of any of the following problems or concerns related to a patient's current drug therapy
    - a. Drugs used with no medical indication
    - b. Medical conditions for which there is no drug prescribed
    - c. Drugs prescribed inappropriately for a particular medical condition
    - d. Anything inappropriate with the current regimen (dose, schedule, route of administration, method of administration)
    - e. Presence of therapeutic duplication
    - f. Drugs to which a patient is allergic
    - g. Presence or potential for adverse drug reactions
    - h. Presence of clinically significant drug-drug, drug-disease, drug-nutrient, or drug laboratory test interactions
  3. Design pharmacotherapeutic regimens
    - Using an organized collection of patient-specific information develop a problem list
    - Specify pharmacotherapeutic goals for a patient that integrate patient-specific, disease-specific and drug-specific information and economic, ethical, and QOL considerations
    - Design a regimen, including modifications to existing therapy, which meet pharmacotherapeutic goals established for a patient
  4. Design monitoring plans for drug therapy regimens
    - Determine parameters to monitor that will measure achievement of pharmacotherapeutic goals for a regimen
    - Define a desirable value range for each selected parameter taking into account patient-specific information
  5. Recommend regimens and corresponding monitoring plans to a prescriber in a way that is systematic and logical and secures consensus from the prescriber.
  6. Modify a plan as necessary based upon evaluation of monitoring data
  7. Document all pharmaceutical care activities appropriately

## 8. Participate effectively in patient care rounds

- Formulate appropriate responses to drug information requests and drug policy questions occurring during patient care rounds
- Demonstrate a commitment to maintaining a database to support participation in patient care rounds

## 9. Provide Information Services

Provide concise, applicable, and timely responses to requests for information from members of the health care team.

- Appropriately elicit all background information necessary to respond to a request for drug information
- Identify the most appropriate sources of information on the use of drugs in pediatric patients
- Formulate a systematic, efficient, and thorough procedure for retrieving drug information.
- Efficiently utilize both manual and computerized sources of drug information
- Evaluate the quality of literature gathered
- Effectively communicate responses to the requestor and/or team

## 10. Prepare written information on drug therapy

- Write a newsletter article on a topic that is timely and is of interest to the intended audience.
  - Prepare a drug class review in a table format.
1. Prepare and orally disseminate information related to drug therapy in pediatric patients.
    - Effectively present cases informally and formally to preceptors and other students.
    - Effectively present an article as part of journal club.

### **Clerkship Task lists/ Responsibilities**

The responsibilities of the student during this rotation shall include the following:

- Attend daily patient work rounds in addition to attending rounds and other educational pediatric conferences as may be scheduled.
- Provide drug information when appropriate to other members of the health care team.
- Monitor patients' drug therapy for therapeutic effect, adverse drug reactions, and drug interactions.
- Provide patient counseling and education concerning drug therapy during hospitalization and at discharge, where possible.

- Participate in formal and informal consultations, including detailed literature searches.
- Provide in-service education for health professionals, when appropriate.
- Attend conferences that pertain to drug therapy and patient care.
- Participate in emergency situations, when possible, including the preparation of emergency drugs and provision of drug information.
- Obtaining complete and accurate medication records for each patient.
- Presenting patient-related information completely, succinctly, and accurately during rounds with preceptor as well as other health care professionals when queried.
- Evaluate the literature on a specific topic pertaining to a patient's therapy. Completing and presenting one literature searches relating to a pediatric drug therapy.
- Submit 2 written pharmaceutical care service given with a maximum of 2 pages using SOAP format
- Submit 4 written drug information responses that the student gave during the rotation
- Submit 4 adverse drug events and 8 drug therapy problems/interventions encountered during the rotation that comprises portfolio requirements in pediatric rotations

### **Core Activities**

**The following activities are described in detail as a guide for more focused student activity in pediatrics ward.**

#### **Patient Care:**

- **Rounds:** The student is expected to actively participate in rounds on a daily basis. Team members should feel free to ask the student questions and ask them to research drug-related issues within a reasonable time period. Any responses to drug information requests or recommendations should be made at this time unless it was more prudent to provide the information/recommendation earlier in the day. The student should document clinical interventions/drug information requests on the appropriate form.

**Patient Monitoring:** The student should be monitoring the drug therapy of all patients on their team at all times. A complete database on each patient should be kept. Students should obtain necessary patient data in the morning so patients can be reviewed with a preceptor in the afternoon.

**Drug Information Requests:** During the morning the student should work on any requests for drug information that they have received from the team. Responses should be reviewed with the



preceptor during the afternoon meeting or earlier if information is needed by the team prior to that time.

#### Oral and Written Communication

**Case Presentations:** Each day the student will informally present the patients currently assigned to their team.

**Written Drug Information:** If requested by the preceptor, the student will write a newsletter article or drug class summary. The preceptor will provide the student with a list of potential topics. The student may then choose the topic they would prefer to work on.

**Journal Club:** The student will review a recently published study that pertains to pediatric patients. The study will be presented at journal club. Attendees will include other pharmacy students, pharmacy faculty, and pharmacy staff members if available. The article should be approved by the preceptor. Please see the journal club information sheet for more details on choice of article and format for presentation format.

**Seminar presentation:** The student will present selected topics preferably most common pediatrics cases encountered in the attachment site individually or in a group. With more focus on current management updates of the cases and local or national guidelines about that specific seminar topics.

**Pharmacy only round:** All students have to present highlight case presentation of each patients allocated and respond to specific pharmaceutical care concerns of the patient

#### Student Readings

During the rotation the student is expected to complete the readings to be suggested by preceptors. Articles on the following diseases states are required: Developmental Pharmacology, Asthma, Meningitis, Pneumonia, Antimicrobial Therapy for Infants and Children, GERD, Seizure disorders , Bone and soft tissue infections, Rheumatic heart disease, Fluid and electrolytes (diarrhea, dehydration, calculating fluid requirements), Cystic fibrosis , UTI, Diabetes, Nutritional disorders and neonatal respiratory distress syndromes.

**Mode of delivery:** Case presentation/morning session, Patient Chart review, attending pediatrics care team, bed side teaching, Journal Club presentation, project work and seminar

#### Mode of assessment:

- |    |                   |     |
|----|-------------------|-----|
| i. | Case presentation | 15% |
|----|-------------------|-----|

ii.	Seminar with pretest	15%
iii.	Ward activities	20%
iv.	Portfolio	10%
v.	Internal oral exam	20%
vi.	Written exam	20%

**Clerkship Title: Gynecology/Obstetric Clerkship Syllabus**

**Clerkship Code: Phar5282**

**Clerkship EtCTS: 3 (2 weeks)**

**Pre-requisites: accomplishment of all didactic courses Year I – Year IV**

**Co-requisites: None**

**Clerkship Description:**

- This rotation will be conducted in Gynecology and Obstetrics wards under department of gynecology and obstetrics. The student should collaborate with other health care providers for the pharmaceutical care needs of the patients.

**Clerkship Goals**

- To prepare the students with the necessary knowledge and problem-solving skills in an obstetrics/gynecology environment for provision of pharmaceutical care.
- To be responsible for providing accurate and timely drug information to gynecologic and obstetric patients and other health care professionals

**Clerkship Objectives:** At the completion of this rotation, the student should be able to:

- Identify and discuss different pharmacologic agents that may be harmful to the fetus or mother in different trimesters of pregnancy and also during breast feeding.
- Discuss pharmacotherapeutic modalities in reproductive system, gynecological and obstetrics pharmacotherapy.
- Consistently obtain complete and accurate drug histories including previous adverse reactions to medications.
- Present well-organized and accurate patient case histories including subsequent problem-plan management.

- Effectively and appropriately communicate with both patients and other health care professionals.
- Participate in the drug decision-making process with health care professionals, and patients
- Describe the clinical presentation and treatment for all encountered medical illnesses during pregnancy and also includes menstrual disorders, hormonal replacement therapy and contraception.
- Design a management therapeutic plan for different compelling diseases associated with pregnancy like ectopic pregnancy, misscarriag /bleeding, premenstrual syndrome, menopause, drugs used during labor and caesarian births.
- Discuss the problem-solving process to determine the risk vs. benefit of using drug therapy during pregnancy and lactation.
- Describe the standard medical care of a pregnant woman.
- Describe commonly encountered bacterial and fungal gynecologic diseases like gonorrhea, syphilis and their treatment, monitoring, and follow up.
- Design a pharmaceutical care plan for patients with pregnancy or other gynecological abnormalities.
- List drugs according to their pregnancy categories and discuss their toxic and beneficial potential.

### **Clerkship Task Lists**

The following **task list/ responsibilities** will include but are not limited to the following:

2. Punctual attendance at daily morning rounds with the assigned surgery team.
3. Punctual attendance at clinical pharmacy conferences.
4. Completely, accurately, and promptly responding to questions from health care professionals.
5. Initiating interactions with other health care professionals.
6. Filling out drug reaction forms for any undesired or unintended effect of a medication.
7. Completing and presenting two literature searches relating to a surgery topic.
8. Obtaining complete and accurate medication records for each patient.
9. Presenting patient-related information completely, succinctly, and accurately during rounds with preceptor as well as other health care professionals when queried.

10. Deciding which medications to use and how to use them with reference to pharmacokinetics and pharmacodynamics.
11. Completely and accurately evaluating the medications of all assigned patients on the surgery service.

**Mode of delivery:** Case presentation/morning session, Patient Chart review, attending surgical wards care team, bed side teaching, Journal Club presentation, project work and seminar

**Mode of assessment:**

i.	Case presentation	15%
ii.	Seminar with pretest	15%
iii.	Ward activities	20%
iv.	Portfolio	10%
v.	Internal oral exam	20%
vi.	Written exam	20%

**Clerkship Title: Pharmaceutical Manufacturing Clerkship Syllabus**

**Clerkship Code: Phar5283**

**Clerkship ECTS: 5 (3 weeks)**

**Pre-requisites: accomplishment of all didactic courses Year I – Year IV**

**Co-requisites: None**

**Clerkship Description:**

This clerkship will be conducted in a selected pharmaceutical manufacturing industry. Students will get an opportunity to appreciate and be part of the day to day activities in a pharmaceutical industry.

**Clerkship Objectives:**

On completion of this course it is expected that students will be able to understand, Handle the scheduled activities in a Pharmaceutical firm. Manage the production of large batches of pharmaceutical formulations.

**Clerkship Activities:**

- 1. Improved Tablet Production:** Tablet production process, unit granulation and pelletization operation improvements, equipments, continuous and batch mixing, rapid mixing granulators, rota granulators, spheronizers and marumerisers, and other specialized Problems encountered.
- 2. Coating Technology:** fluidized bed coating, encountered. granulation and drying equipments. Process, equipments, particle coating, application techniques. Problems
- 3. Parenteral Production:** Area planning & environmental control, wall and floor treatment, fixtures and machineries, change rooms, personnel flow, utilities & utilities equipment location, engineering and maintenance. Lyophilization & Spray drying Technology: Principles, process, freeze-drying and spray drying equipments.
- 4. Capsule Production:** Production process, improved capsule manufacturing and filling machines for hard and soft gelatin capsules. Layout and problems encountered. Production processes,
- 5. Disperse Systems Production:** applications of mixers, mills, disperse equipments including fine solids dispersion, problems encountered.
- 6. Packaging Technology:** Types of packaging materials, machinery, labeling, package printing for different dosage forms.

**7. Air Handling Systems:** Study of AHUs, humidity & temperature control, air filtration systems, dust collectors.

**8. Water Treatment Process:** Techniques and maintenance RO, DM, ultra-filtration, WFI.

**Safety:** Hazards fire, mechanical, electrical, Industrial chemical and pharmaceutical, Monitoring & prevention systems, industrial effluent testing & treatment. Control of environmental pollution.

**Mode of delivery:** Laboratory report, Journal Club presentation, project work and seminar

**Mode of assessment:**

- Attendance and daily rotation activities at pharmaceutical industry.....40%
  - Laboratory report.....20%
  - Pharmaceutical industry Related Presentation-Journal Club
    - Presentation, seminar.....10%
  - External exam .....20%
- Written examination .....10%

**Clerkship Title: Community Pharmacy Clerkship**

**Clerkship Code: Phar5284**

**Clerkship EtCTS: 5 (3 weeks)**

**Pre-requisites: accomplishment of all didactic courses Year I – Year IV**

**Co-requisites: none**

**Clerkship Description:**

- Taking place in community pharmacy services, this experience emphasizes a wide range of exposures, to include: prescription dispensing and OTC selection; patient communication and education; communication with prescribers and other health care providers; and pertinent management activities.
- This community pharmacy practice clerkship provides students with experience in providing Medication Therapy Management to patients in an outpatient pharmacy setting. The student's learning goal for this experience is to develop the essential skills necessary to provide patient-specific care in the community pharmacy setting.

**Clerkship Goals:**

- Provide medication therapy management; review profile and perform medication history to create a personal medication record; and design medication action plan for a patient.
- Communicate and collaborate verbally and in writing with patients, caregivers, health care providers, and others to improve patient care.
- Assess patients and recommend over-the-counter medication, non-drug therapy, medical goods, and complementary therapies beneficial for patient care.
- Triage patients to appropriate health care providers and social service agencies.
- Provide public health and wellness services and educational materials tailored to the needs of patients and caregivers in the community practice setting.
- Demonstrate professional conduct and demeanor that is ethical and responsible displaying integrity, compassion, empathy, and respect.

**Clerkship Objectives**

Upon successful completion of the experiential in community pharmacy, the student will be able to:

- **Process a prescription order**
  - Receive and evaluate the original prescription or refill
  - Review for accuracy, completeness, validity, and appropriateness
  - Differentiate between the prescription drop-off interview and the dispensing/exit interview
  - Prepare prescription for dispensing

- Evaluate and monitor prescription refills
- Determine therapeutic indications
- Help select correct medication and appropriate dosage forms
- Discuss the appropriateness of dosage, frequency, and route of administration with patients and other health care providers
- **Retrieve and interpret patient specific data**
  - Retrieve information from the prescription and/or patient, if possible patient medical record
  - Construct and maintain accurate patient profiles
  - Construct and maintain patient problem lists
  - Interpret patient data in regards to specific disease states and patient complaints.

#### **Identify patient specific drug related problems**

- Identify drug related problems through drug regimen reviews, clinical assessment of a patient, reviewing the patient profile and through patient consultations.
- Utilize available technology and patient interviewing techniques to:
  - identify drug-drug/drug-disease/drug-nutritional and drug-allergy interactions
    - Identify appropriate drug therapy
    - Assess patient compliance
    - Assess patient understanding of their disease states and current medications
- **Demonstrate knowledge of country pharmacy laws and regulations**
  - Utilize professional and ethical judgment in the interpretation of laws and regulations of EFDA
  - Assure the medication order conforms to the federal regulations/EFDA regulations, including Laws/policies regarding controlled substances and generic/therapeutic substitution
  - **Demonstrate knowledge of management skills needed to maintain a pharmacy department**
  - Utilize various methods of purchasing and demonstrate knowledge as to the advantages and disadvantages of each method
  - List technologies that can be used in pharmacy operations
  - Utilize interpersonal skills in working with health care providers and pharmacy staff



- Determine methods to improve a pharmacy operating
- Apply licensing, regulatory, and accreditation standards which are necessary for the operation of a hospital pharmacy
  
- **Assess and evaluate the financial impact of drug therapy**
  - Evaluate drug therapy costs, including costs of drugs as well as monitoring costs
  - Evaluate financial consideration of alternative therapies
  
- **Provide patient counseling and disease state education**
  - ✓ Effectively conduct a patient interview
  - ✓ Review medication information with the patient to insure appropriate use and compliance of drug therapy
  - ✓ Utilize patient education materials to assist patients in understanding their roles in effective medication use
  - ✓ Counsel patients with respect to assessment of adverse effects of their medications and how to care for these effects
  - ✓ Counsel patients with respect to non-prescription medications
  - ✓ Counsel patients with respect to common community-related disease states
  - ✓ Counsel and train patients on the appropriate use of disease state monitoring tools (blood-pressure cuffs, blood glucose monitors, peak-flow monitors, etc.)
  - ✓ Document patient interventions and patient care appropriately
  
- **Conduct patient evaluations**
  - Recognize the need for pharmacist interventions
  - Refer patients to appropriate medical personnel when necessary
  
- **Provide drug information**
  - Effectively retrieve and evaluate medical information for patients and health care providers
  - Describe the pharmacist's role in providing health care information within the community
  - Demonstrate effective communication skills, written and verbal, to preceptors, patients, physicians, and other health professionals

- Obtain necessary background information to accurately answer drug information questions.
- Effectively evaluate, interpret, and summarize pharmaceutical and medical literature
- Identify and utilize, both efficiently and effectively, appropriate drug information sources
- **Demonstrate professional attitude and conduct**
  - Exhibit neatness and professionalism in appearance and work
  - Accept constructive criticism, demonstrate receptiveness to feedback
  - Demonstrate dependability, punctuality, courteousness, and tactfulness when dealing with patients and members of the health care team
  - Maintain professional and ethical standards- compliance with laws and regulations, good professional judgment, reliability, and credibility when dealing with colleagues, patients, and other health care professionals
  - Display self-directed (independent) learning, conduct self-assessment, develop a personal learning plan, and pursue knowledge independently
  - Demonstrate competency in organizing and planning, establish management skills, set meaningful and attainable goals and be consistently well prepared
  - Maintain confidentiality
  - Display a patient and empathetic attitude towards patients including appropriately body language showing genuine interest in the well-being of the patient
  - Respond to assignments in a timely manner and is consistently on time and ready for work upon arrival, with no unexcused absences.

**Mode of delivery:**

Prescription review, evaluation of community pharmacy establishments, journal club presentation, project work and seminar

**Mode of assessment:**

- |   |     |
|---|-----|
| ● Attendance and on-site activities at community pharmacy                     | 15% |
| ● Portfolio   | 20% |
| ● Community pharmacy related presentation – journal club presentation/seminar | 15% |
| ● Internal oral exam  | 25% |

- Written Examination

25%

### **Task List for Community Rotations**

A list of specific tasks has been established for each of the required rotations to serve as a guide to the minimum requirements necessary to demonstrate competency. Provided below are samples of a few of the tasks defined for each specific core experiential rotation. Reasonable effort should be made to accomplish these tasks when possible.)

- Process Prescriptions (> 60) of various types.
- Evaluate patient medication profiles. Discuss and document the resolution of 6 patient-profile (Clinical) of Drug related problems.
- Provide a minimum of two written patient assessments and pharmaceutical care plans (MTM services) of assigned patients.
- Develop/Discuss/Document resolution of 8 patient- specific financial problems in purchasing medications for chronic diseases
- Discuss the handling of the following scenarios with preceptor: suspected RX forged, discovery of an error, prescriber consensus challenges, notifying a patient that a medication error has occurred, and dealing with difficult patient / MD.
- Counsel patients on the use of medications (> 20 pts) including: insulin, statins, opiates (acute/chronic), inhalers, warfarin, pediatric dose measuring/administration, or others selected by preceptor. The student should report calculations done in the rotation. Students will be required to complete and document three counseling sessions and associated follow-up/interventions.

**Module 29: Professional elective clerkship****Module name: Professional elective clerkship****Module category:** Elective**Module code:** Phar-M5292**Module Number: 29****Module weight in ECTS:** = 5**Prerequisite: successful accomplishment of all core modules courses Year I – Year IV**  
**Courses:**

<b>Clerkship name</b>	<b>Clerkship code</b>	<b>ECTS</b>
Psychiatry clerkship	Phar5291	<b>5 ECTS (3 wks)</b>
Surgery clerkship	Phar5292	<b>5 ECTS (3 wks)</b>
Oncology & Hematology clerkship	Phar5293	<b>5 ECTS (3 wks)</b>
Ophthalmology & ENT clerkship	Phar5294	<b>5 ECTS (3 wks)</b>
Emergency Medicine Clerkship	Phar5295	<b>5 ECTS (3 wks)</b>
Dermatology clerkship	Phar5296	<b>5 ECTS (3 wks)</b>
Pharmaceutical quality control	Phar5297	<b>5 ECTS (3 wks)</b>
Pharmaceutical regulatory affairs	Phar5298	<b>5 ECTS (3 wks)</b>
Pharmaceutical whole sale & promotion	Phar5299	<b>5 ECTS (3 wks)</b>

**Module description:** This Module contained courses which students are to choose one among them. This will help the students delineate their future carrier, i.e., it is designed in such a way as to suit for the interest and competence of students who are interested to pursue their future career in one of the following courses: pharmaceutical industry, Pharmaceuticals quality control, Pharmaceutical regulatory, Pharmaceutical whole sale & promotion, Nuclear pharmacy, oncology & hematology clerkship, Ophthalmology & ENT clerkship, Dermatology clerkship, and emergency medicine.

**Module objective:** course specific

**Module competency:** the students should develop this competencies based on their choice of course

- Organize and control the manufacturing, compounding and packaging of pharmaceutical products
- Provide pharmacist-initiated care to patients and ensure the optimal use of medicines

**Mode of delivery: Parallel**

**Mode of Assessment:** The assessment criteria are based on continuous assessment of class activities, individual and group assignment, attachments and report writing, test and final exams.

**Module learning teaching methods**

Case presentation/morning session, patient chart review; ward rounds, journal club & seminar, project work, bedside teaching, visit to industries, whole sale, & regulatory bodies.

**Clerkship Title: Psychiatry Clerkship Syllabus**

**Clerkship Code: Phar5291**

**Clerkship EtCTS: 5 (3 weeks)**

**Pre-requisites: accomplishment of all didactic courses Year I – Year IV**

**Co-requisites: None**

**Clerkship Description:**

- The rotation will be conducted in Psychiatry Wards and/or Clinics under the department of Psychiatry. The students should team up with the psychiatry team for the patient care activities in the psychiatry unit attached.

**Clerkship Goals**

1. To be familiarized with Pharmaceutical care services for Psychiatric patients.
2. To provide appropriate and timely drug related information to Psychiatry team and other health care professionals working in the department.
3. To gain a general understanding of the Psychotropic medications used in different types of acute and chronic Psychiatric disorders such as antipsychotics, mood stabilizers, antidepressants, drugs for sleep disorders, anxiolytics and substance related disorders.

**Clerkship Objectives:** At the completion of this rotation, the students should be able to:

- Demonstrate an understanding of the pharmacotherapy of the most common acute and chronic Psychiatric disorders
- Provide Pharmaceutical care service for patients with psychiatric disorders
- Retrieve and interpret patient chart information
- Perform psychiatric patient interview
- Obtain a complete medication history including prescribed medications, over the-counters, complementary medications (herbals, supplements, etc.), previous adverse reactions and drug allergies. Include dose, route of administration, and frequency of use. Document in the appropriate manner
- Obtain information regarding behavioral issues such as tobacco, alcohol, and illicit drug use, diet, and exercise

- Provide rational drug therapy recommendations based on information obtained from the patient interview, physical assessment/examination, laboratory data, medical record, etc.
- Design medication regimens that are convenient, affordable, and will produce optimal patient outcomes (e.g. side effect profile, dosage form, etc.)
- Follow up and evaluation of drug regimen to evaluate outcome, contraindications, drug-drug and food-drug interactions utilizing knowledge of medicinal chemistry, biochemistry, pharmacokinetics, herbal/nutritional supplements/over-the-counter medicines
- Evaluate the primary literature and national treatment guidelines and its utility in meeting patient needs (including case reports, if appropriate) to make a reasonable decision based on available information
- Identify goals of therapy, including effects on quality of life (QOL)
- Present well-organized and accurate patient case histories with subsequent therapeutic plan.
- Understand the pathophysiology and the psychopharmacology of different psychiatric disorders with special emphasis on psychotropic medications, substance related disorders and non-pharmacologic therapies including: electroconvulsive therapy and psychotherapies.
- Communicate effectively with patients, health care professionals and other stakeholders
- Establish and maintain collaborative working relationship with psychiatric patients, health care professionals and other stakeholders.
- Apply the clinical therapeutic management principles of psychiatric disorders in light of specific patient factors, national and international guidelines.
- Demonstrate the ability to identify specific drug-related problems for psychiatric patients with acute and/or chronic illness.
- Discuss the therapeutic plans of the patients encountered on the psychiatric ward and OPD
- Identify monitoring parameters for monitoring patients' treatment outcomes.
- Conduct monitoring of psychiatric patient's drug therapy.
- Write a complete and formal drug information response
- Work with other health care professionals to ensure the safe and cost-effective drug therapy.
- Provide patient education regarding the optimal use, expected outcomes, and adverse effects of psychotropic drugs.

- Demonstrate ability to perform discharge/follow-up medication teaching and/or instruct patients in medication education classes
- Provide adherence support for Psychiatric patients on Psychotropic medications.
- Contribute in prevention and management of substance related disorders.
- Provide compassionate, respectful and caring service.
- Adherence to ethical principles and legal practice

### **Clerkship Task Lists**

The following **task list/ responsibilities** will be included but are not limited to the following:

1. Attend daily ward rounds, morning sessions and other educational conferences as scheduled.
2. Conduct Admission medication history taking, medication reconciliations and discharge medication use counselling
3. Provide patient counseling and education concerning drug therapy during hospitalization
4. Provide drug information when appropriate to other members of the Psychiatry team.
5. Monitor patients' drug therapy outcomes, and drug interactions.
6. Participate in formal and informal consultations, including detailed literature searches.
7. Participate in psychiatry emergency situations, when possible, including the preparation of emergency drugs and provision of drug information.
8. Obtaining complete and accurate medication records for each patient.
9. Presenting patient-related information completely during rounds with preceptor as well as other health care professionals when queried.
10. Evaluate the literature on a specific topic pertaining to a patient's therapy. Completing and presenting one literature searches relating to drug therapy on psychiatry.
11. Submit 2 written pharmaceutical care service given using SOAP format, 4 written drug information responses that the student gave during the rotation, and drug therapy problems/interventions encountered during the rotation that comprises portfolio requirements in psychiatry rotations
12. Punctuality for all activities.



**Mode of delivery:** Case presentation/morning session, patient chart review, attending psychiatric wards care team round, bed side teaching, journal club presentation, project work and seminar

**Mode of assessment:**

i.	Case presentation	15%
ii.	Seminar with pretest	15%
iii.	Ward activities	20%
iv.	Portfolio	10%
v.	Internal oral exam	20%
vi.	Written exam	20%

**Clerkship Title: Surgery Clerkship Syllabus**

**Clerkship Code: Phar5292**

**Clerkship ECTS: 5 (3 weeks)**

**Pre-requisites: accomplishment of all didactic courses Year I – Year IV**

**Co-requisites: None**

**Clerkship Description:**

- This rotation will be conducted in surgical wards under department of surgery. The student should collaborate with other health care providers for the pharmaceutical care needs of the patients.

**Clerkship Goals**

4. To become familiar with the provision of clinical pharmacy services to surgery patients.
5. To be responsible for providing accurate and timely drug information to surgical team and other health care professionals related to a surgery service.
6. To gain a general understanding of the medications involved with a surgery service with emphasis on antibiotic therapy, nutritional support, and pain management.

**Clerkship Objectives:** At the completion of this rotation, the student should be able to:

- Consistently obtain complete and accurate drug histories including previous adverse reactions to medications.
- Present well-organized and accurate patient case histories including subsequent problem-plan management.
- Effectively and appropriately communicate with both patients and other health care professionals.
- Punctually and thoroughly complete and present the results of a literature search related to a disease, medication, or surgery performed on a surgery service.
- Spend the necessary amount of time in the patient care area to complete all service responsibilities related to his/her patients.
- Initiate interactions with other health care professionals.
- Understand the pathophysiology and pharmacology of the medications used on a surgery service with special emphasis on antibiotics and pain management.

- Understand the fundamental principles of acid-base balance, and fluid and electrolyte therapy.
- Have a general understanding of the role of parenteral and enteral nutrition in the surgery patient.
- Recognize and monitor adverse effects of medications and make a rational decision for their prevention and/or treatment.
- Understand the controversies involved with deciding which drug is the most effective and least toxic drug in specific clinical situations.
- Calculate a measured creatinine clearance given the appropriate data.
- Discuss the effects of renal and/or liver disease on the appropriate dosing of medications.
- Quickly and accurately calculate doses for medications used on the surgery service with emphasis on antibiotics and pain relievers.
- Realize that medication-related questions from health care professionals should only be answered when all of the relevant facts are known and that accuracy is of highest priority.
- Promptly and accurately search and answer questions from health care professionals when the answer is not initially known.
- Realize the importance of patient confidentiality.
- Know how to decide the order of priority for monitoring patient medications when on a busy surgery service.

### **Clerkship Task Lists**

The following **task list/ responsibilities** will include but are not limited to the following:

12. Punctual attendance at daily morning rounds with the assigned surgery team.
13. Punctual attendance at clinical pharmacy conferences.
14. Completely, accurately, and promptly responding to questions from health care professionals.
15. Initiating interactions with other health care professionals.
16. Filling out drug reaction forms for any undesired or unintended effect of a medication.
17. Completing and presenting two literature searches relating to a surgery topic.
18. Obtaining complete and accurate medication records for each patient.
19. Presenting patient-related information completely, succinctly, and accurately during rounds with preceptor as well as other health care professionals when queried.

20. Deciding which medications to use and how to use them with reference to pharmacokinetics and pharmacodynamics.
21. Completely and accurately evaluating the medications of all assigned patients on the surgery service.

**Mode of delivery:** Case presentation/morning session, Patient Chart review, attending surgical wards care team, bed side teaching, Journal Club presentation, project work and seminar

**Mode of assessment:**

i.	Case presentation	15%
ii.	Seminar with pretest	15%
iii.	Ward activities	20%
iv.	Portfolio	10%
v.	Internal oral exam	20%
vi.	Written exam	20%

**Clerkship Title:** Oncology and Hematology Clerkship Syllabus

**Clerkship Code:** Phar5293

**Clerkship ECTS:** 5 (3 weeks)

**Pre-requisites:** accomplishment of all didactic and Laboratory based courses Year I – Year IV

**Co-requisites:** None

**Clerkship Description:**

- This clerkship program will be conducted at oncology center of a hospital to integrate pharmaceutical care and Clinical Pharmacy concepts and oncology patient care through patient care activities, case discussions, and others. The student is expected to provide pharmaceutical care to oncology patients.

**Clerkship Objectives:** At the completion of this clerkship, the student should be able to:

### **1. Neoplastic Diseases**

- Describe the general course of the disease including the clinical findings, diagnosis, complications of disease, and prognosis.
- Describe the histopathologic classification and staging of the malignancy.
- Define the goals and rational treatment programs including surgical, radiological, pharmacological, and immunological.
- Identify the agent or combination of agents of choice including rationale, dose, schedule, and potential toxicities.

### **2. Chemotherapeutic Agents**

- Discuss the pharmacology including mechanism of action, adverse reactions, dose ranges, and pharmacokinetics of the common cancer chemotherapeutic agents, hormonal and immunotherapeutic agents, and monitor their use in patients with cancer.
- Recommend dosage adjustments based on renal function tests, liver function tests, and hematologic or other indices.
- Discuss cancer chemotherapy with respect to cell kinetics.

- Discuss the rationale for induction, consolidation, maintenance, and adjuvant chemotherapy.
- Describe the agents implicated, time course, reversibility, symptoms, and predisposing factors for chemotherapy-induced adverse reactions including pulmonary disease, nephrotoxicity, cardiac toxicity, neurotoxicity, hepatotoxicity, radiation recall, gastrointestinal toxicity, hematologic complications, metabolic toxicity, and secondary malignancy.

### **3. Radiation Therapy and Surgery**

- Discuss the role of diagnostic, palliative, and curative radiation therapy and surgery in cancer management.
- Understand the monitoring and management of the complications associated with radiation therapy and surgery.

### **4. Nausea and Vomiting, Pain control**

- Recommend appropriate therapy with consideration of the proper drug, dose, and regimen.
- Know the relative onset, duration, and severity of nausea and vomiting with different chemotherapeutic agents.
- Describe nondrug methods for antiemetic control.

### **5. Transfusion Therapy**

- Discuss the use of blood products in cancer therapy including red blood cells, white blood cells, and platelets.
- Suggest premedication regimens to help reduce hypersensitivity reactions to blood products.
- Know the complications associated with the use of transfusion products.

### **6. Infectious Disease**

- Describe the types of bacterial and nonbacterial infections seen in patients with cancer.
- Recommend and monitor appropriate antibiotic therapy in patients with cancer with respect to patient specific factors.

### **7. Chemotherapy Extravasations**

- List drugs that are vesicants.
- Comprehend the management of extravasations.

### **Clerkship Activities:**

- Round with the multidisciplinary team and demonstrate appropriate interpersonal, leadership and collaboration skills. In addition, the student will provide pharmacotherapeutic recommendations
- Evaluate drug therapy regimens for appropriateness of drug, dose, and dosage regimen, route/method of administration, compliance, therapeutic duplications, therapeutic outcomes, cost, adverse drug reactions, and interactions.
- Design effective therapeutic regimens when therapy is initiated to best address patient specific goals and outcomes. Regimens should be guided by evidence based medicine.
- Design monitoring plans to achieve appropriate efficacy outcomes and avoid unwarranted adverse events/side effects with commonly used antineoplastic agents.
- Meet daily with preceptor to review patient care issues to ensure items have been addressed.
- Provide timely responses to drug information requests from the team, nursing, pharmacists, preceptor, and other health care providers.
- Counsel patients/caregivers when newly diagnosed or changes are made to routine home medications.
- Participate in preparing cytotoxic medications
- Document clinical activities and interventions and report ADEs and Medication error

**Mode of delivery:** Case presentation/morning session, Patient Chart review, attending surgical wards care team, bed side teaching, Journal Club presentation, project work and seminar

**Mode of assessment**

i.	Case presentation	15%
ii.	Seminar with pretest	15%
iii.	Ward activities	20%
iv.	Portfolio	10%
v.	Internal oral exam	20%
vi.	Written exam	20%

**Clerkship Title:** Ophthalmology and ENT Clerkship syllabus

**Clerkship Code:** Phar5294

**Clerkship EtCTS: 5 (3 weeks)**

**Pre-requisites:** accomplishment of all didactic and Laboratory based courses Year I – Year IV

**Co-requisites:** None

**Clerkship Description:**

- The primary purpose of this clerkship is to develop an understanding of pharmacotherapy for the patients followed by Ophthalmology and ENT ward. The main focus will be providing pharmaceutical care for patients with glaucoma and infectious disease of the eye, ear, nose and throat

**Clerkship Objectives:** At the completion of this rotation, the student should be able to:

- Authoritatively discuss the pathophysiology and pharmacotherapy disease states seen.
- Demonstrate the ability to identify specific drug-related problems for patients with acute and/or chronic illness.
- Authoritatively discuss the therapeutic plans of the patients encountered on the wards
- Identify optimal variables for monitoring patients including the identification of adverse drug reactions.
- Conduct monitoring of patient's drug therapy.
- Write a complete and formal drug information response
- Provide patient education regarding the optimal use, expected outcomes, and adverse effects of drug therapy regimens.
- Work with other health care professionals to ensure the safe, correct, and cost-efficient administration of medications.

**Clerkship Activities:** The responsibilities of the students during this rotation shall include the following:

- Round with the multidisciplinary team and demonstrate appropriate interpersonal, leadership and collaboration skills for admitted patients at the ward.
- Closely follow patients from a medical team in the ward as assigned by the preceptor.
- Closely review all the drug therapy of each patient being followed (for both outpatient and inpatient) including pharmacology, toxicology, pharmacokinetics, drug interactions, and monitoring parameters. From these data, a therapeutic plan will be developed.



- Provide timely responses to drug information requests from the team, nursing, pharmacists, preceptor, and other health care providers.
- Counsel patients/caregivers when newly diagnosed or changes are made to routine home medications up on discharge. Emphasize on counseling administration technique and handling of glaucoma medication/eye drops, at least complete 5 patient counseling sessions on administration and adherence to glaucoma medications.
- Complete at least 2 drug related problems identified and the care plan
- Document all patient care activities in manner outlined by the preceptor.
- Prepare and give a formal presentation.

**Mode of delivery:** Case presentation/morning session, Patient Chart review, attending surgical wards care team, bed side teaching, Journal Club presentation, project work and seminar

**Mode of assessment**

i.	Case presentation	15%
ii.	Seminar with pretest	15%
iii.	Ward activities	20%
iv.	Portfolio	10%
v.	Internal oral exam	20%
vi.	Written exam	20%

**Clerkship Title: Emergency Medicine Clerkship****Clerkship code: Phar5295****Clerkship EtCTS: 5 (3 weeks)****Clerkship Description**

The purposes of this attachment is to promote understanding of the ways in which pharmacists contribute to care in the Emergency medicine and to suggest future directions for the role of pharmacists in providing that care.

- working with emergency physicians, emergency nurses, and other healthcare professionals to develop and monitor medication-use systems that promote safe and effective medication use in the Emergency medicine, especially for high-risk Emergency medicine patients and procedures;
- Collaborating with emergency physicians, emergency nurses, and other healthcare professionals to promote medication use in the Emergency medicine that is evidence-based and aligned with national quality indicators;
- Participating in the selection, implementation, and monitoring of technology utilized in the medication-use process;
- Providing direct patient care as part of the interdisciplinary emergency care team;
- Participating in or leading emergency preparedness efforts and quality improvement initiatives;

Educating patients, caregivers, and healthcare professionals about safe and effective medication use

**Clerkship Objectives**

At the completion of this rotation:

**Patient care:** Hospital-Based Emergency Care together with the Emergency medicine care team the student should be able to ensure appropriate fulfillment of patient medication needs thereby to reduce or eliminate medication errors, and to evaluate for cost-effective medication therapy for the patient and hospital. As part of the interdisciplinary Emergency medicine care team, pharmacists can provide care to critically ill patients by:

- participating in resuscitation efforts;
- providing consultative services that foster appropriate evidence-based medication selection;
- providing consultation on patient-specific medication dosage and dosage adjustments;

- providing drug information consultation to emergency physicians, emergency nurses, and other clinicians;
- monitoring for patient allergies and drug interactions;
- monitoring patient therapeutic responses (including laboratory values);
- continuously assessing for and managing adverse drug reactions; and
- Gathering or reviewing medication histories and reconciling patients' medications.

In addition to the above, students can provide care to ambulatory patients in the Emergency medicine by:

- modifying medication regimens based on collaborative practice agreements for management of certain patient populations who return to ED;
- offering vaccination screening, referral, and administration;
- providing patient and caregiver education, including discharge counseling and follow-up; and
- Providing information on obtaining medications through patient assistance programs, care funds, and samples.

### **Emergency preparedness planning.**

Students expected to acquire basic knowledge to assertively exercise their responsibilities in preparing for and responding to disasters because treatment of disaster victims almost always involves the use of pharmacologic agents and ensuring the efficacy and safety of the medication-use process is a natural role for pharmacists.

**Quality improvement initiatives.** Students are expected to acquire basic knowledge about:

- guiding the development of evidence-based treatment protocols, algorithms, and/or clinical pathways that are congruent with nationally accepted practice guidelines and quality indicators;
- assisting in the development, implementation, and assessment of various technologies used throughout the ED medication-use process;
- conducting failure mode and effects analysis and root cause analysis on error-prone aspects of the medication-use process;
- participating in ED-based and hospital-wide committees (e.g., P&T, infection control, disaster) that impact medication use in the ED;
- Assisting in surveillance and reporting of adverse drug reactions.

**Education.** The will able to provide education and information to healthcare professionals, patients, and the public they come in contact with in the health systems' emergency service areas.

**Mode of Delivery**

- Ward round
- Bed side teaching
- Morning case presentation
- Journal club

**Mode of assessment**

i.	Case presentation	15%
ii.	Seminar with pretest	15%
iii.	Ward activities	20%
iv.	Portfolio	10%
v.	Internal oral exam	20%
vi.	Written exam	20%

**Clerkship Title: Dermatology Clerkship Syllabus**

**Clerkship Code: Phar5296**

**Clerkship ECTS: 5 (3 weeks)**

**Pre-requisites: accomplishment of all didactic and Laboratory based courses Year I – Year IV**

**Co-requisites: None**

**Clerkship Description:**

- The primary goal of this rotation is to give the student an understanding of the recognition, diagnosis, and treatment of common dermatologic disorders and monitoring the safe and effective use of medications. Patients seen are out patients at dermatology clinic. The students shall have authoritative understanding of the different dermatologic preparation and their administration technique.

**Clerkship Activities**

- Conduct patient interview to organize and collect pertinent patient data including past medical history, past and current medication therapy
- List common drugs that are responsible for drug – induced skin reaction during the rotation
- Identify common drug – induced dermatological conditions
- Design and implement therapeutic plan for the conditions identified
- Design a monitoring plan for the care plan
- Write at least one detailed report of drug- induced skin reaction
- Provide timely responses to drug information requests from the team, nursing, pharmacists, preceptor, and other health care providers.
- Counsel patients/caregivers when newly diagnosed or changes are made to routine home medications up on discharge

**Mode of delivery:** Case presentation/morning session, Patient Chart review, attending surgical wards care team, bed side teaching, Journal Club presentation, project work and seminar

**Mode of assessment:**

i.	Case presentation	15%
ii.	Seminar with pretest	15%
iii.	Ward activities	20%
iv.	Portfolio	10%
v.	Internal oral exam	20%
vi.	Written exam	20%

**Clerkship content:**

**A. ward activities**

1. Attend and actively participate in ward rounds and attending rounds according to the schedule of the service.
2. Each student will make a verbal presentation in fifteen minutes or less of any patient for which s/he is responsible. Each patient presentation should include the following elements;
  - a. Patient's name, age, sex
  - b. Reason for admission and chief complaint
  - c. History of present illness
  - d. Significant medical history
  - e. Present medication history
  - f. Summary of review of systems and physical examination
  - g. Admission of laboratory values
  - h. Pharmaceutical considerations
    - An evaluation of current therapy
    - Proposed alternative therapies
    - Monitoring parameters for therapeutic response and toxicity
    - Any pharmacokinetic parameters applicable endpoints of therapy
3. Interview and obtain medication histories from all patients assigned by the pharmacy preceptor.
4. Monitor drug therapy of all assigned patients.

5. Students will apply the information obtained through the interviewing and monitoring process to:

A. evaluate current drug therapy

B. anticipates and identifies drug therapy problems

C. meets the objectives outlined in this syllabus

6. Provide patient specific drug information (verbally and/or in writing) to nurses, physicians, peers and pharmacy preceptors.

7. Counsel all assigned patients about their drugs.

**B. Non-ward activities**

Students will prepare and make at least one in-service presentation (s) to the clinicians on their unit on a drug or pharmacy related topic. All students will attend and participate in morning meeting and journal club presentation. Presenters are assigned by pharmacy preceptors in turn.

**Clerkship Title:** Pharmaceutical quality control

**Clerkship Code:** Phar5297

**Clerkship ECTS:** 5 (3 weeks)

**Pre-requisites:** accomplishment of all didactic and Laboratory based courses Year I – Year IV

**Co-requisites:** None

**Clerkship Description:**

- This clerkship program will be conducted at the quality control units of big pharmaceutical industries and/or the quality control laboratory of the national regulatory authority.

**Clerkship Objectives:** At the completion of this clerkship, the student should be able to:

- Conduct basic quality control procedures for common pharmaceutical products in Ethiopia
- Identify the quality issues unique to the Ethiopian context
- Clerkship Activities
  1. Registration of drugs and medical devices
  2. Sampling and sample preparation for analysis
  3. Identification and assay of raw materials, bulk and finished products by classical methods of analysis
    - 3.1. Titration
    - 3.2. Gravimetry
  4. Identification and assay of raw materials, bulk and finished products by modern instrumental methods
    - 4.1. UV/Visible spectrophotometry
    - 4.2. IR spectroscopy
    - 4.3. HPLC
    - 4.4. GC
    - 4.5. Potentiometry
  5. Structural elucidation of unknown drug entities by IR spectroscopy, NMR spectroscopy and mass spectrometry
  6. Microbiological quality control of raw materials, bulk and finished products
    - 6.1. Microbial limit tests
    - 6.2. Preservative efficacy testing
    - 6.3. Microbiological assay of antibiotics
    - 6.4. Sterility testing
    - 6.5. Pyrogen testing
  7. Validation and audits of analytical procedures
    - 7.1. Validation
    - 7.2. Calibration
    - 7.3. System suitability tests
  8. Validation and audits of analytical results



9. Documentation and release of results

10. Preparing and use of standard operating procedures

**Mode of delivery:** Case presentation/morning session, Patient Chart review, attending surgical wards care team, bed side teaching, Journal Club presentation, project work and seminar

**Mode of assessment:**

- Attendance and daily rotation activities.....40%
- Report submission and Presentation .....30
- External exam .....20%
- Written Examination .....10%

**Clerkship Title:** Pharmaceutical regulatory affairs

**Clerkship Code:** Phar 5298

**Clerkship ECTS:** 5 (3 weeks)

**Pre-requisites:** accomplishment of all didactic and Laboratory based courses Year I – Year IV

**Co-requisites:** None

**Clerkship Description:**

- This clerkship program will be conducted at regional (zonal/wereda/city admin) and/or the national regulatory authority, pharmaceuticals manufacturing firms and pharmaceuticals whole sales organizations

**Clerkship Objectives:** At the completion of this clerkship, the student should be able to:

- Conduct basic inspection of pharmaceutical retail outlets
- Participate in dossier evaluation
- Participate in product registration
- Participate in the registration and licensing of professionals.
- Regulate pharmaceutical products and pharmacy practice to the context of standardized protocol and national policy to ensure:
  - Safe, effective and quality pharmaceutical product and service.

**Clerkship Activities:**

1. To evaluate different functions of national and regional drug regulatory authorities
2. Evaluation of dossiers
  - 2.1.Evaluation of dossier of INDA
  - 2.2.Evaluation of dossier of NDA
  - 2.3.Evaluation of dossier of ANDA
3. Registration of pharmaceuticals and medical devises
  - 3.1.Orphan drug registration
  - 3.2.Fast track registration
  - 3.3.Evaluation of post registration change report
  - 3.4.Regulation of poor quality(Falsified and substandard quality) drugs
4. Participation in regulation of cosmetics and food products
5. Assessment of Quality management system (QMS) documents.

6. Assessment Quality risk management(QRM) documents
7. Preparation of SOP for calibration and validation of equipment's
  - 6.1. Preparation of SOP for calibration and validation of HPLC
  - 6.2. Preparation of SOP for calibration and validation of UV-Visible spectroscopy
  - 6.3. Preparation of SOP for calibration and validation of GC
  - 6.4. Preparation of SOP for calibration and validation fluorescence spectroscopy
  - 6.5. Preparation of SOP for calibration and validation infrared spectroscopy
6. Evaluation of good manufacturing practice documents
7. Evaluation Quality control documents
8. Evaluation of quality assurance documents
9. Evaluation of pharmacovigilance documents
  - 9.1. Review of drug discovery and development documents
  - 9.2. Ethics in clinical trial
  - 9.3. Informed consent
10. Evaluation of documents of good laboratory practice
11. Evaluation of documents related to:
  - 11.1. Retention of samples and records
  - 11.2. Batch release documents
  - 11.3. Distribution documents
  - 11.4. Certificate of analysis
  - 11.5. Cleaning validation
    - 11.5.1. Manufacturing firm and environment cleaning validation
12. Evaluation of marketing authorization documents
13. Participation in registration and licensing of professionals
14. Auditing and Evaluation of pharmaceuticals manufacturing firms
15. Auditing and evaluations of pharmaceutical whole sales
16. Evaluation of pharmaceuticals import and/or exporting organizations

**Mode of delivery:** Seminar presentation, Laboratory practices, Attending national and/regional drug regulatory authorities and laboratory based teaching.

**Mode of assessment:**

1. Presentation (20%)

2. Quizzes (5%)
3. Exam (50 %)
4. Practical exam (25%).

### References

8. **WHO.** Quality assurance of pharmaceuticals A compendium of guidelines and related materials. 2<sup>nd</sup> edition. 2006. Geneva, Switzerland.
9. **ICH Q10.** Quality management System. 2007.
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13. Good Laboratory Practice Regulations, 2nd Edition, Sandy Weinberg, Vo. 69, DeckerSeries
14. Quality Assurance of Pharmaceuticals – A compendium of guidelines and related materials – Vol. I – WHO Publications
15. A guide to Total Quality Management – Kaushik Maitra and Sedhan K.Ghosh.
16. ISO 9000 and Total Quality Management – Sadhank. G. Ghosh.
17. The International Pharmacopoeia Vol. 1,2,3,4 - 3rd Edition, General Methods of Analysis and Quality specification for Pharmaceutical Substances, Excipients and Dosage forms

**Clerkship Title: Pharmaceutical wholesale & promotion**

**Clerkship Code: Phar5299**

**Clerkship ECTS: 5 (3 weeks)**

**Pre-requisites: accomplishment of all didactic and Laboratory based courses**

**Year I – Year IV**

**Co-requisites: None**

**Clerkship Description:**

- This clerkship program will be conducted at local pharmaceutical import/wholesale and marketing institutions.

**Clerkship Objectives:** At the completion of this clerkship, the student should be able to:

- Participate in the import and wholesale of pharmaceutical products in the private sector
- Participate in promotion and marketing of pharmaceutical products
- Accurately perform the pharmaceutical marketing and gaining an appreciation of working with other functions in a pharmaceutical company for brand success.
- Demonstrate the process of bringing pharmaceutical products to the market.
- Apply basic marketing principles to the process of bringing pharmaceutical products to the market.

**Content:**

- This is a practical course focusing on pharmaceutical whole sale and promotion
- Students will have the opportunity to gain hands-on practical experience pharmaceutical promotion. Students will be required to prepare and perform different forms on pharmaceutical whole sale and promote pharmaceutical products
- Students will also focus on practical skills related to marketing to physicians and patients.

## **Domains:**

- A domain is a major responsibility or duty. You can think of a domain as a major heading in an outline format. You will see the domains displayed as black bars on the outline. Five domains are included in the content outline and are noted below.
- Products in the Pharmaceutical Whole Sale: Trends and Monitoring
- Pharmaceutical Marketing and the Industry Environment
- Pharmaceuticals and Pricing
- Promotional Marketing Activities and Practices
- Media and Pharmaceutical Marketing

### **Domain 1: Products in the Pharmaceutical Whole Sale: Trends and Monitoring**

#### **Explain trends and monitoring in pharmaceutical whole sale.**

Knowledge of Product specifications such as quantity, availability, expiration, manufacturer, contaminants, ingredients, and cost.

Knowledge of monitoring in pharmaceutical whole sale

### **Domain 2: Pharmaceutical Marketing and the Industry Environment**

#### **Review principles and process of pharmaceutical marketing and industry environment**

Knowledge of:

Principles and process of pharmaceutical marketing

The pharmaceutical industry supply chain

#### **Domain 3: Pharmaceuticals and Pricing Knowledge of:**

Price determination of pharmaceutical products

### **Domain 4: Promotional Marketing Activities and Practices**

#### **Discuss marketing to physicians**

**Knowledge of:**

Sales force, including call plan development

Journal ads

Medical education

Speaking and consulting fees

**Explain marketing to patients**

**Knowledge of:**

Positioning and messaging

Legal and regulatory considerations and principals

Acquisition

Retention

Public relations

**Domain 5: Media and Pharmaceutical Marketing Define media and pharmaceutical marketing Knowledge of:**

Media and pharmaceutical marketing

**Mode of assessment:**

Attendance and daily rotation activities at whole sale and promotion center....	40%
Portfolio preparation and submission.....	20%
Pharmaceutical whole sale and promotion Related Presentation – formal case presentation, Journal Club Presentation, seminar.....	10%
External exam .....	20%
Written Examination .....	10%

## Module 30: Pharmaceutical Research II

**Module Name:** Pharmaceutical Research I I

**Module Category:** Core

**Module Code:** Phar-M4301

**Module Number:** 30

**Module Weight:** 5 ECTS

### Courses:

Course name	Course code	ECTS
<b>Directed study</b>	Phar 5301	<b>5</b>

### Module description:

This module is intended to equip pharmacy students with a basic working knowledge of pharmaceutical research methods. It also gives the trainee an acquaintance with research proposal writing, critical appraisal of scientific paper and application of common statistical packages. The module includes hands on research experience in the form of a directed studies course, which offers the student to perform research which culminates in the submission of substantial research work in the form of a senior essay/directed studies report paper.

### Module objective:

After successful completion of this Module the students will be able to:

1. Differentiate the major types of study designs
2. Identify the main issues in the design, conduct and presentation of a research
3. Explain the major elements that need to be examined when making a critical assessment of a research paper.
4. Demonstrate how to deal with each of these elements with reference to a published paper
5. Demonstrate a basic understanding of common statistical packages useful for data processing and analysis
6. Explain the major components of research in the pharmaceutical sciences
7. Prepare a research protocol and conduct pharmaceutical research

### Module competencies:

Upon a successful completion of this module, students will be able to conduct with minimal supervision by a senior pharmacist (researcher) research in the different areas of pharmacy practice and/or pharmaceutical sciences..

**Mode of delivery (Parallel/Block):** Block

### Module teaching/learning method:

Learning Activities



Students are expected to undertake among others the following major learning activities:

- Engage in learning by doing (independent study, group assignments, presentation, report writing, etc...)
- Participation and note takings during class lectures and debates and discussions;
- Reviewing the literature
- Data collection/conducting experiment (as appropriate), analyse results, report write-up and presentaiton

Teaching Methods

The course facilitator is expected to:

- Lecture for introducing concepts and topics, and give references, facilitate discussions, ask questions, give and correct assessments, forming groups, encouraging students for peer learning
- Monitor student progress and provide feedback

**Module mode of assessment:**

- Quizzes
- Exam
- Assignments
- A directed studies report
- A directed studies presentation and defense

## Course syllabus

<b>Course Name:</b>	Directed study
<b>Course code:</b>	Phar5301
<b>Module Name:</b>	Pharmaceutical research II
<b>Module Code:</b>	<b>Phar-M 5301</b>
<b>Course ECTS:</b>	5

**Totally required hours for the module: 135**

**Project work:** 133

**Presentation(s):** 2

**Year/Semester Course is offered:** Year V Semesters I and II

**Course prerequisite/s:** Research methods

### Course description:

The module includes hands on and supervised research experience enabling the student to perform research, conduct experiments, collect data interpret the results, report in the form of formal scientific writing and present the findings to an audience of fellow students and instructors.

### Course objective:

After completion of this course students will be able to:

- Prepare a research protocol and conduct research in the area of pharmaceutical sciences and or pharmacy practice

**Course mode of delivery:** Parallel

### Course learning and teaching methods

- Mentoring and continuous monitoring of student progress

### Assessment techniques:

- Continuous evaluation by the advisor
- Evaluation of the written report by the advisor
- Evaluation of the written report by the examiner
- Evaluation of the presentation by the examiner

### Teachers' and students' role

#### Roles of Instructors

The instructor will be expected to:

- Allocation adequate consultation hours for the student
- Guide the student in the identification of plausible research topic

- Monitor the progress of the student
- Take remedial actions to ensure timely completion of the project

### **Roles of Students**

Students are expected to:

- Maintain regular contact with advisor
- Critically appraise available literature and identify research gaps in consultation with the advisor
- Develop appropriate data collection procedures and/or research protocol in consultation with the advisor
- Collect data interpret the results
- Act in compliance with all ethical and legal standards

### **References:**

- To be determined in consultation with assigned advisor

### **Course schedule**

- To be defined in consultation with the advisor. Students and advisors are encouraged to identify important milestones in the conduct of the research and accordingly monitor progress.

### Module 31 Team Training Program

**Module Name: Team training program**

**Module Category: Core**

**Module Code: Com-HM5311**

**Module Number: 31**

**Module Weight: 7 ECTS**

**Courses:**

S/N	Course name	Course code	ECTS
1	Team training program	ComH5311	7

### Module Description

#### Module Objective

To produce competent health professional who went through an integrated series of learning experiences which will enable them to understand the health problems of a rural community and be able to solve them through evidence based innovative approaches.

The general objectives of the Rural Community Health Teaching Programme are:

1. To introduce students to the health problems and health service delivery system of the rural community as well as expose them to clinical service and research activities
2. To prepare health science students to perform effectively as competent health professionals who can effectively plan and deliver health services that responds to the priority needs of the community in a primary health care approach.

The specific objectives of the Rural Community Health Teaching Programme are,

1. To familiarize health science students to the context of the rural settings and the socio-demographic and health situation of people living in a rural area
2. To enable students conduct "community diagnosis" by defining socio-economic, political and environmental aspects of a given community (determinants of socio-economic status) and draw an action plan which would enable students to suggest appropriate intervention measures
3. To enable students obtain data pertaining to the socio-demographic and health status of a rural population that are useful to inform health service planning and implementation.
4. Organize intervention utilizing the concept components and strategies of community participation and multi-sectoral approach
5. To ensure health science students are capable of conducting mini research -collecting, analysing and writing up reports using data generated through quantitative and qualitative methods.
6. Familiarize students with public health importance of specific health problems such as malnutrition, communicable diseases ... etc.
7. Learn tools how to identify and prioritize health problems, draw action plan and implement interventions and evaluate the program

8. To equip students with basic knowledge to evaluate the effectiveness and efficiency of community intervention.
9. Provide health education and health services in the health centres and surrounding communities. Develop the communication skill through interactive learning among team members, resident supervisors, supervisors and community
10. Understand and develop team spirit and create a solid foundation for their future work in a team with laboratory and pharmacy units.

Enrich sense of belongingness and develop positive attitude of graduates to work in a community where there is poor infrastructure

### **Module Competency**

At the completion of the program students are expected to:

- Acquire basic knowledge and skills of understanding and solving individual (clinical) and community health problems, as well as adopt positive and helping attitudes in patient care/handling, attitude on research, attitude on the importance of evidence for decision, plagiarism, etc.
- Moreover, students improve their oral and writing communication skills while interacting among themselves and with various community members including health and women development workers, community opinion leaders, faith leaders, school officials, students, local government officials, civil society organizations and many others. They shall also be involved in the discussion of community affairs and perhaps engaged in advocating basic health rights. Students shall also improve their writing communication skill through the preparation of study reports and communication aids, as well as presentation of findings in dissemination, learning and advocacy workshops
- Students will also improve skills in team building and team working as they will be assigned in groups throughout the programs. Through the process they will learn how individual behaves within a group, how to appreciate differences and consider as strength, handle conflict, etc.
- They will also be exposed to solve problems through adopting self-management of certain resources and opportunities such as serve their own food, timing for shared resources including toilet and washing facilities etc., how to best conform to local community tradition and lifestyle.

### **Module Mode of Delivery**

As the program is competency and outcomes-based program it follows an innovative curriculum approach adopting problem solving and adult learning principles. In general the teaching learning process followed a principle of adult learning involved highly interactive discussions, case studies, group learning, problem based study in order to produce a medical/paramedical graduates who are problem solver inventively. The three domains of learning, namely, Knowledge, skill and attitude, will be given due attention in equal focus.

The following will be considered in the selection of the teaching and learning methods:

- **Student focused-** all learning methods should emphasize individual activities that students shall perform
- **Collaborative- learners should consider** collaboration and cooperation to enrich the delivery of teaching contents focused to specific learning outcome
- **Diversity** – learning teaching methods should be different depending on learning outcome

Each class room as well as field teaching activities should reflect the main curriculum of the different disciplines. Moreover, the teaching activities should help students to be imaginative, creative and innovative. Therefore, courses shall be properly designed and shall have alignment of the three components/elements (course objective, content and teaching methods) of the learning and teaching at course/unit/chapter levels.

The major teaching and learning methods and activities suggested to be used in the implementation of the curriculum are described below when and where.

- 1) Interactive lecture: class room teaching will be involved throughout the six week of the program, including the orientation week. This activity will help students improve their thinking, reasoning and discussion skills. The content of the lecture depends on the objectives of the teaching outcome. Lecture sections should involve brainstorming, dialogue, argument, case study, and encouraging individual reading.
- 2) actual conduct of community diagnosis that including field data collection using standard instrument, data processing and analysis, priority setting, drawing of intervention action plan;
- 3) mini research that includes
  - Problem identification, topic selection and development of proposal,
  - development of data collection instruments,
  - actual data collection (can be primary or secondary),
  - data analysis, interpretation and recommendation of possible solutions for intervention
  - report writing;
  - Documentation and presentations of the research output

- 4) Class room seminars and case reports (clinical)
- 5) Whole group session: this is to amalgamate and reflect on individual or group activities
- 6) Health facility and community clinical services

### Module Assessment

- Student attitude
- Student presentation
- Supervisors checklist and progressive assessment
- Log-book
- Report writing
- Written/oral exam

### Broad schedule

#### WEEK I& II

DAY	RESPONSIBLE	SPH & FAMILY MEDICINE	SPH, SoP& FAMILY MEDICINE
	WEEK BRAND	ORIENTATION & CommDx	INTERVENTION PLAN & Comm. Child health
	TIME	WEEK I	WEEK II
MONDAY	AM (8AM-12AM)	Orientation, lecture-Census & MCH	Health Center SURVEY**** Community opinion FOR PRIORITY SETTING
	PM(2PM-4PM)	lecture-Nutrition survey	Data entry & analysis
	EVENING(4:30-6:00)	lecture-School survey	
TUSEDAY	AM (8AM-12AM)	lecture-EH survey	Hospital assessment
	PM(2PM-4PM)	lecture-Health F. survey	Data entry & analysis
	EVENING(4:30-6:00)	lecture-priority setting	
WEDNSDAY	AM (8AM-12AM)	Census & MCH SURVEY*	Data management & analysis
	PM(2PM-4PM)	Data entry	PRIORITY SETTING
	EVENING(4:30-6:00)	Seminarby Family health	PRELEMINARY REPORT
THURSDAY	AM (8AM-12AM)	Anthropometry/nutrition, U5 Morbidity SURVEY & Comm. child health care	INTERVENTION PLAN
	PM(2PM-4PM)	Data entry	
	EVENING(4:30-6:00)	lecture-Research proposal	Seminar on Proposal writing
FRIDAY	AM (8AM-12AM)	Env. Health SURVEY**	Individual Research proposal writing (RA)
	PM(2PM-4PM)	School SURVEY****	
	EVENING(4:30-6:00)	Data entry & management	
SATURDAY	AM (8AM-12AM)	Data analysis practical training	FINALIZE Draft research proposal QUIZ
Deliverable by STUDENTS			Final Draft research Proposal

#### WEEK III

DAY	RESPONSIBLE	SPH; , SoP, PEDIATRICS & DERMATOLOGIST							
	WEEK BRAND	PEDIATRICS & DERMATOLOGY & INTERVENTION							
	TIME	WEEK III							
		A	B	C	D	E	F	G	H

MONDAY	AM (8AM-12AM)	HC	SH	RA	RA	HC	SH	RA	RA
	PM(2PM-4PM)	HC	SH	RA	RA	HC	SH	RA	RA
	EVENING(4:30-6:00)	SEMINAR-Ped							
TUESDAY	AM (8AM-12AM)	RA	HC	EH	RA	RA	HC	EH	RA
	PM(2PM-4PM)	RA	HC	EH	RA	RA	HC	EH	RA
	EVENING(4:30-6:00)	SEMINAR-Derma							
WEDNSDAY	AM (8AM-12AM)	HP service		Community service		HP service		Community service	
	PM(2PM-4PM)	RA							
	EVENING(4:30-6:00)	SEMINAR-Ped							
THURSDAY	AM (8AM-12AM)	RA	RA	HC	SH	RA	RA	HC	SH
	PM(2PM-4PM)	RA	RA	HC	SH	RA	RA	HC	SH
	EVENING(4:30-6:00)	SEMINAR-Derma							
FRIDAY	AM (8AM-12AM)	EH	RA	RA	HC	EH	RA	RA	HC
	PM(2PM-4PM)	EH	RA	RA	HC	EH	RA	RA	HC
	EVENING(4:30-6:00)	SEMINAR-Ped							
SATURDAY	AM (8AM-12AM)	FOLLOWUP ON INTERVENTION							
		QUIZ							
Deliverable by STUDENTS		Start Data collection							

#### WEEK IV

DAY	RESPONSIBLE	SHP, SoP, INTERNIST & OPHTHALMOLOGIST							
	WEEK BRAND	INT. MEDICINE & OPHTHALMOLOGY & INTERVENTION							
	TIME	WEEK IV							
		A	B	C	D	E	F	G	H
MONDAY	AM (8AM-12AM)	RA	HC	SH	RA	RA	HC	SH	RA
	PM(2PM-4PM)	RA	HC	SH	RA	RA	HC	SH	RA
	EVENING(4:30-6:00)	SEMINAR-Med							
TUESDAY	AM (8AM-12AM)	RA	RA	HC	EH	RA	RA	HC	EH
	PM(2PM-4PM)	RA	RA	HC	EH	RA	RA	HC	EH
	EVENING(4:30-6:00)	SEMINAR-Ophtha							
WEDNSDAY	AM (8AM-12AM)	Community service		HP service		Community service		HP service	
	PM(2PM-4PM)	RA							
	EVENING(4:30-6:00)	SEMINAR- Med							
THURSDAY	AM (8AM-12AM)	SH	RA	RA	HC	SH	RA	RA	HC
	PM(2PM-4PM)	SH	RA	RA	HC	SH	RA	RA	HC
	EVENING(4:30-6:00)	SEMINAR-Ophtha							
FRIDAY	AM (8AM-12AM)	HC	EH	RA	RA	HC	EH	RA	RA
	PM(2PM-4PM)	HC	EH	RA	RA	HC	EH	RA	RA
	EVENING(4:30-6:00)	SEMINAR- Med							
SATURDAY	AM (8AM-12AM)	FOLLOWUP ON INTERVENTION							
		QUIZ							
Deliverable by STUDENTS		Data analysis							

#### WEEK V

DAY	RESPONSIBLE	SPH, SoP, OBSTATRICIAN & DERMATOLOGIST							
	WEEK BRAND	GYN-OBS & DERMATOLOGY & INTERVENTION							
	TIME	WEEK V							
		A	B	C	D	E	F	G	H
MONDAY	AM (8AM-12AM)	RA	RA	SH	HC	RA	RA	SH	HC
	PM(2PM-4PM)	RA	RA	SH	HC	RA	RA	SH	HC
	EVENING(4:30-6:00)	SEMINAR-GYN							
TUESDAY	AM (8AM-12AM)	EH	RA	HC	RA	EH	RA	HC	RA
	PM(2PM-4PM)	EH	RA	HC	RA	EH	RA	HC	RA
	EVENING(4:30-6:00)	SEMINAR-GYN							



<b>WEDNSDAY</b>	AM (8AM-12AM)	<b>Community service</b>	<b>HP service</b>	<b>Community service</b>	<b>HP service</b>				
	PM(2PM-4PM)	<b>RA</b>							
	EVENING(4:30-6:00)	<b>SEMINAR-Pharma</b>							
<b>THURSDAY</b>	AM (8AM-12AM)	<b>HC</b>	<b>SH</b>	<b>RA</b>	<b>RA</b>	<b>HC</b>	<b>SH</b>	<b>RA</b>	<b>RA</b>
	PM(2PM-4PM)	<b>HC</b>	<b>SH</b>	<b>RA</b>	<b>RA</b>	<b>HC</b>	<b>SH</b>	<b>RA</b>	<b>RA</b>
	EVENING(4:30-6:00)	<b>SEMINAR-Derma</b>							
<b>FRIDAY</b>	AM (8AM-12AM)	<b>RA</b>	<b>HC</b>	<b>RA</b>	<b>EH</b>	<b>RA</b>	<b>HC</b>	<b>RA</b>	<b>EH</b>
	PM(2PM-4PM)	<b>RA</b>	<b>HC</b>	<b>RA</b>	<b>EH</b>	<b>RA</b>	<b>HC</b>	<b>RA</b>	<b>EH</b>
	EVENING(4:30-6:00)	<b>SEMINAR-GYN</b>							
<b>SATURDAY</b>	AM (8AM-12AM)	<b>FOLLOWUP ON INTERVENTION</b>							
		<b>QUIZ</b>							
<b>Deliverable by STUDENTS</b>		<b>Start write up</b>							

### WEEK VI

<b>DAY</b>	<b>RESPONSIBLE</b>	<b>SPH, SoP, &amp; SURGEON</b>							
	<b>WEEK BRAND</b>	<b>SURGERY &amp; INTERVENTION EVALUATION</b>							
	<b>TIME</b>	<b>WEEK VI</b>							
		<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>
<b>MONDAY</b>	AM (8AM-12AM)	<b>HC</b>	<b>HC</b>	<b>EH</b>	<b>SH</b>	<b>HC</b>	<b>HC</b>	<b>EH</b>	<b>SH</b>
	PM(2PM-4PM)								
	EVENING(4:30-6:00)	<b>SEMINAR-Sugery</b>							
<b>TUSEDAY</b>	AM (8AM-12AM)	<b>EH</b>	<b>SH</b>	<b>HC</b>	<b>HC</b>	<b>EH</b>	<b>SH</b>	<b>HC</b>	<b>HC</b>
	PM(2PM-4PM)	<b>RA</b>							
	EVENING(4:30-6:00)	<b>SEMINAR-Surgery</b>							
<b>WEDNSDAY</b>	AM (8AM-12AM)	<b>REPORT PREPARATION</b>							
	PM(2PM-4PM)	<b>REPORT PREPARATION</b>							
	EVENING(4:30-6:00)	<b>SEMINAR-Surgery</b>							
<b>THURSDAY</b>	AM (8AM-12AM)	<b>REPORT FINALIZATION</b>							
	PM(2PM-4PM)	<b>REPORT FINALIZATION</b>							
	EVENING(4:30-6:00)	<b>SEMINAR-Surgery</b>							
<b>FRIDAY</b>	AM (8AM-12AM)	<b>REPORT PRESENTATION</b>							
	PM(2PM-4PM)	<b>REPORT PRESENTATION</b>							
	EVENING(4:30-6:00)	<b>REPORT PRESENTATION</b>							
<b>SATURDAY</b>	AM (8AM-12AM)	<b>BACK TO CAMPUS</b>							
<b>Deliverable by STUDENTS</b>		<b>Start write up</b>							

Module 32 Comprehensive Exit Exam

Module Name: Comprehensive Exit Exam

Module Category: Core

Module Code: Phar-M5321

Module Number: 32

Module Weight: Non-credited

Courses:

S/N	Course name	Course code	ECTS
1	Comprehensive Exit Exam	Phar5321	NA

**Module Description**

This module is a non-credited module that evaluates whether students have acquired the necessary knowledge, attitude and skills in their stay in the program. Questions will be prepared by all units in the school/department and will assess the major competency areas in the profession of pharmacy.

**Module Objective:**

- To assess the students' competence to practice, as an entry level pharmacist, in the different pharmacy practice settings

**Module Competency: NA****Module Mode of Delivery: NA****Module mode of Assessment:**

- Written comprehensive exam
- Evaluated as Pass or Fail