University of Tripoli

Faculty of Medicine

Bachelor of Medicine and Surgery Degree Program
2022

SYLLABUS COMMITTEE

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19	Naima Sultan Dafer Vice President of Quality and Performance Evaluation Department Quality and Performance Evaluation Office	Member
20	Faten Abdulhamid BenRajab Professor Department of Padiatrics	Internal Evaluator

CONTENTS

INTRODUCTION

Optimization of patient care with high standards of knowledge, skills and attitudes dictates an ongoing need for curriculum development to keep up with the rapid changes in medical education and the complexity of patient care.

The Faculty of Medicine, University of Tripoli, is committed curriculum development to achieve its vision, mission and objectives.

The curriculum committee with, cooperation from all the departments, worked hard to develop the curriculum and it will continue to work to ensure the implementation of the new changes especially the horizontal and vertical integration and the exposure of the students to clinical practice at early stage of their training.

The curriculum committee is planning a comprehensive training programme for all lecturers and faculty staff in all aspects of modern medical education and assessment, to ensure that the intended learning outcomes of the new curriculum are achieved.

I extend my sincere thanks to every one who has contributed to the development of the curriculum and I expect more hard work and commitment to complete the cycle of communication development and to start a new one.

President of the Curriculum Committee

Professor: Nureddin Hasan Aribi

MBBCh, FRCS Edinburgh

Professor of Surgery

MBBCh PROGRAM

VISION

The Bachelor of Medicine and General Surgery program aspires to be a program characterized by high quality standards, accredited and internationally recognized in medical education, and research, based on modern scientific methods in teaching, learning and modern assessment methods.

MISSION

Building an educational system based on high quality educational programs that stimulate creativity and have the ability to prepare doctors who can compete and apply all professional ethics and care for social values with the aim of improving the health status of the community, by providing distinguished health care and services, and pledges to support scientific research in the service of developing medical services.

FRAMEWORK OF MBBCH PROGRAM

PROGRAM OBJECTIVES:

1. Describe the anatomical structure of the human body, embryonic development, the characteristics and functions of different body organs, the abnormalities and disorders associated with these organs, and the importance of molecular, biochemical and cellular mechanisms that maintain the body's internal milieu.
2. Describe the microscopic structure of the tissues and cells of the body, the most important histological changes associated with various diseases, the most important drugs used in the treatment of different diseases, and their clinical application.
3. Describe microorganisms and parasites that cause common diseases, and know the symptoms and treatment methods of these diseases**.**
4. Describe the fundamentals of forensic medicine science, toxicology, medical ethics, scientific research, and medical jurisprudence (Islamic law).
5. Acquire knowledge on the importance of primary health care and define the general principles of infection, prevention, and control at health care centers**.**
6. Describe the symptoms of common diseases, emergency situationsand their evaluation methods, diagnosis, available treatment options and their complications for the specialty of internal medicine, surgery, pediatrics, ophthalmology, obstetrics and gynecology.
7. Explain the principles and basic scientific medical methods in medical practice in all specializations, and acquire the ability for sustainable learning in all branches of medicine.

8. Recognize leadership skills and the importance of teamwork, and working effectively with other healthcare professionals.

ADMISSION CRITERIA

To be admitted to the faculty, students must have obtained a secondary school level certificate and pass the faculty evaluation exam. The faculty could give a personal interview, for those applicants who have the character and scientific qualities to be medical students, and practitioners.

PROGRAM INTENDED LEARNING OUTCOMES

A. KNOWLEDGE AND UNDERSTANDING

1. Describes the anatomical structure of the human body, the embryonic development, the characteristics, the function of different body organs, and the most important abnormalities and disorders associated with these organs, and the importance of molecular, biochemical and cellular mechanisms, that maintain the internal milieu of the body.
2. Describe the microscopic structure of tissues and cells of the body, and the histological changes associated with various diseases, and the most important drugs and their clinical applications in curing diseases.
3. Describe the microorganisms and parasites cause common diseases, and identify the symptoms, and methods of treatment.
4. The student will describe the fundamentals of forensic medicine science, toxicology, medical ethics, scientific research, and medical jurisprudence (Islamic law).
5. The student will recognize the importance of community primary health care, and defines the general principles of infection, prevention, and control in health care centers.
6. The student will describe the symptoms of common diseases, emergency situations, and their clinical evaluation, diagnosis method and treatment options and complications for the specialty of internal medicine, surgery, pediatrics, ophthalmology, obstetrics, and gynecology.
7. The student will explain the essential and basic scientific medical methods required in medical practice in all specialties, and acquires the ability for continuous learning in all branches of medicine.
8. Recognize leadership skills, the importance of teamwork, and working effectively with other healthcare professionals.

B. INTELLECTUAL SKILLS

1. Discuss the anatomical structure of the human body, embryonic development, the characteristics, functions of different body organs, and the most important abnormalities and disorders associated with these organs, and the importance of molecular, biochemical and cellular mechanisms, that maintain the internal milieu of the body.
2. Discuss the microscopic structure of tissues and cells of the body, and the histological changes associated with various diseases, and the most important drugs and their clinical application in curing diseases.
3. Discuss the microorganisms and parasites that cause common diseases, and identify the symptoms and methods of treatment.
4. Discuss the fundamentals of forensic medicine science, toxicology, medical ethics, scientific research, and medical jurisprudence (Islamic law).
5. Discuss the importance of community primary health care, and defines the general principles of infection, prevention and control in health care centers.
6. The student will describe the symptoms of common diseases, emergency situations, and their clinical evaluation, diagnosis methods, and treatment options and complications for the specialty of internal medicine, surgery, pediatrics, ophthalmology, obstetrics, and gynecology.
7. Discuss the essential and basicscientific medical methods, required in medical practice in all specialties, and acquires the ability for continuous learning in all branches of medicine.
8. Discuss leadership skills, and the importance of teamwork, and working effectively with other professionals in healthcare setting.

C. PRACTICAL AND CLINICAL SKILLS

1. Use the anatomical structure of the human body, embryonic development, thecharacteristics, functions of different body organs, and the most important abnormalities and disorders associated with these organs and the importance of molecular, biochemical and cellular mechanisms that maintain the internal milieu of the body.
2. Use the microscopic structure of tissues and cells of the body, and the histological changes associated with various diseases, and the most important drugs and their clinical application in curing diseases.
3. Apply microbiology and parasitology that cause common diseases, to identify symptoms and methods of treatment.
4. Apply the fundamentals of forensic medicine science, toxicology, medical ethics, scientific research, and medical jurisprudence (Islamic law).

5. Apply the principles of community primary health care, and defines the general principles of infection, prevention and control in health care centers.
6. The student will use his knowledge about symptoms of common diseases, and emergency situations and apply clinical evaluation and diagnosis methods, also treatment options and complications for the specialty of internal medicine, surgery, pediatrics, ophthalmology, obstetrics, and gynecology.
7. Apply the essential and basic scientific medical methods required in medical practice in all specialties, and acquires the ability for continuous learning in all branches of medicine.
8. Use leadership skills, and understand the importance of teamwork, and working effectively with other professionals in healthcare setting.

D. GENERIC AND TRANSFERABLE SKILLS

1. The ability to communicate effectively with patients and their families in accordance with ethical recommendations, and give proper consultation.
2. The ability to accept constructive criticism from colleagues, respectsother healthcare professionals, and accepts medical advice.
3. The ability to work and exchange experience with other health care professionals in managing patients, regardless of degree or profession.
4. The ability to work effectively in a multidisciplinary team, showing respect and collaboration with team members.
5. The ability to present information in written and oral forms in a clear and organizedmanner.
6. The ability to use information technology and communication skills to gain access to biomedical information and to keep pace with advances in knowledge and practice.
7. Able to apply the principles of continuous learning.
8. Able to manage time effectively.

STUDY

For the students who have passed the evaluation exam, the study plan is divided into three stages: **Seven** semesters, **Five** clinical phases and an internship year (Complementary training). The Bachelor's degree of medicine and surgery require (**192**) study units.

For the students who joined the faculty after finishing the medical science preparation year, the same study plans apply to them but are excluded from studying the courses of that year.

CURRICULUM MAP

STAGE 1: BASIC MEDICAL SCIENCES
(FIRST SEMESTER)

	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Intr. Of Biochemistry	BC120	2	2	0	0	Admission Exam
Intr. Of Physiology	PS120	2	2	0	0	Admission Exam
Intr. of Histology	HS120	2	2	1	0	Admission Exam
Intr. of Anatomy	AN120	2	2	0	0	Admission Exam
Medical Physics	MP130	3	3	0	0	Admission Exam
English Language I	EL121	2	2	0	0	Admission Exam
Arabic Language	AL120	2	2	0	0	Admission Exam
Total		**15**	**15**	**1**	**0**	

(SECOND SEMESTER)

	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Biochemistry I	BC141	4	3	2	1	BC120
Physiology I	PS141	4	3	2	1	PS120
Histology I	HS141	4	3	2	1	HS120
Anatomy I	AN131	3	2	2	1	AN120
EnglishLanguage II	EL122	2	2	0	0	EL121
Total		**17**	**13**	**8**	**4**	

(THIRD SEMESTER)

	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Biochemistry II	BC142	4	3	2	1	BC141
Physiology II	PS142	4	3	2	1	PS141
Histology II	HS142	4	3	2	1	HS141
Anatomy II	AN132	3	2	2	1	AN120
EnglishLanguage III	EL123	2	2	0	0	EL122
Total		**17**	**13**	**8**	**4**	

(FOURTH SEMESTER)

	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Biochemistry III	BC243	4	3	2	1	BC141
Physiology III	PS243	4	3	2	1	PS141
Anatomy III	AN233	3	2	2	1	AN131,AN132
Microbiology & Immunology	MB241	4	3	2	1	BC142,PS142,HS141
TOTAL		**15**	**11**	**8**	**4**	

(FIFTH SEMESTER)

	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Anatomy IV	AN234	3	3	2	1	AN131,AN132
Parasitology	PA240	4	3	2	1	BC142,PS142,HS142,AN233
PharmacologyI	PH241	4	3	2	1	BC142,PS142,HS142,AN132
Pathology I	PT241	4	3	2	1	BC142,PS142,HS142,AN233
Clinical SkillsI	CS211	1	0	2	1	Determined by achieved number of units
TOTAL		**16**	**11**	**10**	**5**	

(SIXTH SEMESTER)

	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Microbiology & Immunology II	MB342	4	3	2	1	MB241,BC243,PS243
PharmacologyII	PH342	4	3	2	1	PH241, PS243
Pathology II	PT342	4	3	2	1	PT241, AN234
Information Technology	IT320	2	1	2	1	Determined by achieved number of units
Clinical SkillsII	CS312	1	0	2	1	CS211
TOTAL		**15**	**11**	**10**	**5**	

(SEVENTH SEMESTER)

	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
CommunityMedicine I	CM341	4	3	2	1	PA240, MB342, IT320
PharmacologyIII	PH343	4	3	2	1	PH241, PS243
Pathology III	PT343	4	3	2	1	PT241,AN234
Behavior Science	BS320	2	2	0	0	Determined by achieved number of units
Clinical SkillsIII	CS313	1	0	2	1	CS312
TOTAL		**15**	**11**	**8**	**4**	
Total of stage one		**110**	**85**	**53**	**26**	

STAGE 2: THE CLINICAL STAGE

After passing all the required courses of the first stage (the basic medical science stage), the student enters the second stage. This stage is divided into five clinical semestersm, where the student is allowed to register in any available clinical semester. The clinical semesters are alternating, and students are not permitted to register for two different clinical semesters, or any two courses of them at the same time.

FIRST CLINICAL SEMESTER:

	Code	Unit	Lecture (hrs)	Bedside teaching (hrs)	Lab (hrs)	Tutorial (hrs)	Weeks	Prerequisites
Ophthalmology	OP440	4	2	5	1	2	12	All Basic NonClinicalCourses
Forensic& Toxicology	FT440	4	6	1	2	2		
Community Medicine	CM442	4	6	2	1	1		
Total		**12**	**15**	**7**	**3**	**6**	**12**	

SECOND CLINICAL SEMESTER:

	Code	Unit	Lectures (hrs)	Bedside teaching(hrs)	Lab(hr)	Tutorials (hrs)	Weeks	Prerequisites
Obstetrics and Gynecology	OG480	**8**	**6**	**6**	**1**	**6**	**12**	All Basic Non Clinical Courses

THIRD CLINICAL SEMESTER:

	Code	Unit	Lectures (hrs)	Bedside teaching (hrs)	Lab (hr)	Tutorials (hrs)	Weeks	Prerequisites
Pediatrics	PD480	**8**	**3**	**10**	**1**	**8**	**12**	All BasicNon Clinical Courses

FOURTH CLINICAL SEMESTER:

	Code	Unit	Lectures (hrs)	Bedside teaching (hrs)	Lab (hrs)	Tutorials (hrs)	Weeks	Prerequisites
Medicine	MD512	**12**	**5**	**15**	**1**	**5**	**18**	All Basic Non Clinical Courses

FIFTH CLINICAL SEMESTER:

	Code	Unit	Lectures (hrs)	Bedside teaching (hr)	Lab (hrs)	Tutorials (hrs)	Weeks	Prerequisites
Surgery	SG512	**12**	**5**	**20**	**3**	**5**	**18**	All Basic Non Clinical Courses

SUPPORTIVE COURSES:

	Code	Unit	Lectures (hrs)	Bedside teaching (hrs)	Lab (hrs)	Tutorials(hrs)	Weeks	Prerequisites
Radiology	RD440	**4**	**4**	**3**	**0**	**3**	**6**	All Basic Non Clinical Courses
Total of the clinical stage		**56**	**39**	**61**	**7**	**34**		
Total		**166**	**123**	**61**	**60**	**59**		

STAGE 3: THE TRAINING STAGE (INTERNSHIP STAGE)

After successfully passing all the courses, the student will begin the training course (internship). The bachelor's degree in medicine and surgery is only awarded after completion of the training period, as stated below.

Department	Surgery	Medicine	Pediatric	Obstetrics &Gynecology	Community	Emergency	Psychiatry &Elective
Duration	12wks	12wks	8wks	8wks	4wks	4wks	4wks
Unit	**6**	**6**	**4**	**4**	**2**	**2**	**2**
Total	**26 units**						

Bachelor's degree in Medicine and Surgery:

To qualify for the award of the Bachelor's degree in Medicine and Surgery, a candidate must complete **192** credit points of the study program. The degree is awarded only after successful completion of the internship stage.

(Editing or adding courses are permitted based on the recommendations of the curriculum committee and the consent of the relevant departments, and the Faculty board approval).

SYLLABUS DETAILS

STAGE 1: BASIC MEDICAL SCIENCES

1-FIRST SEMESTER

Subject Title	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Introduction of Biochemistry	BC120	2	2	0	0	Admission Exam
Introduction of Physiology	PS120	2	2	0	0	Admission Exam
Introduction of Histology	HS120	2	2	1	0	Admission Exam
Introduction of Anatomy	AN120	2	2	0	0	Admission Exam
Medical Physics	MP130	3	3	0	0	Admission Exam
English Language I	EL121	2	2	0	0	Admission Exam
Arabic Language	AL120	2	2	0	0	Admission Exam
Total		**15**	**15**	**1**	**0**	

INTRODUCTION OF BIOMOLECULE (BC120)

BASIC INFORMATION:

Title	**Introduction of Biochemistry**
Code	BC120
Units	2 units - 2 hours /week
Duration	14
Prerequisites:	Admission exam

OBJECTIVES OF THE COURSE:

By the end of the course, the studand will be able to:

1. Distinguish between different chemical bonds, functional groups, aliphatic and aromatic hydrocarbons.
2. Understand the interaction of biomolecules with water.
3. Understand the physiological buffers and the imbalances of blood pH (alkalosis and acidosis).
4. Describe the structure and physical properties of the building blocks of protein, carbohydrate, nucleotides and nucleic acids.
5. Identify the terminology of nucleoside and nucleotide.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Describe the fundamentals of biochemistry such as functional groups, aliphatic and aromatic hydrocarbon, and different types of biochemical bonds, and the biological elements of the human body.
2. Describe the acid – base equilibrium: dissociation of a weak acids, pH and pKa, titration of weak acids, Henderson-Hasselbach equation.
3. Describe how carbohydrates is digested and absorbed and its clinical correlations.
4. Describe how protein is digested and absorbed and its clinical correlations.
5. Define the structure of amino acids, sugars, purines and pyrimidines, nucleosides and nucleotides, nucleotides derivatives, nucleotide triphosphate, polynucleotides, the structure, and function of DNA and RNA.

B. INTELLECTUAL SKILLS

1. Discuss the fundamentals of biochemistry such as functional groups, aliphatic and aromatic hydrocarbon, and different types of biochemical bonds, and the biological elements of the human body.
2. Discuss the acid–base equilibrium: dissociation of a weak acids, pH and pKa, titration of weak acids, Henderson-Hasselbach equation.
3. Discuss how carbohydrates is digested and absorbed and its clinical correlations.
4. Discuss how protein is digested and absorbed and its clinical correlations.
5. Able to draw the structure of amino acids, sugars, purines and pyrimidines, nucleosides and nucleotides, nucleotides derivatives, nucleotide triphosphate, polynucleotides, the structure, and function of DNA and RNA.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Use the fundamentals of biochemistry such as functional groups, aliphatic and aromatic hydrocarbon, and different types of biochemical bonds.
2. Apply the acid – base equilibrium: dissociation of weak acids, pH and pKa, titration of weak acids, Henderson-Hasselbach equation.
3. Use carbohydrates digestion and absorption and its clinical correlations.
4. Demonstrate how protein is digested and absorbed, and theirclinical correlations.

5. Draw the structure of amino acids, sugars, purines and pyrimidines, nucleosides, and nucleotides, nucleotides derivatives, nucleotide triphosphate, polynucleotides, the structure, and function of DNA and RNA.

D. GENERAL AND TRANSFERABLE SKILLS

1. Manage time effectively.
2. Respect colleques.
3. Understand scientific terms and distinguish between them.
4. Self learning ability**.**

COURSE CONTENT:

I- INTRODUCTION

- Biomolecules, Chemical bonds, Organic chemistry, Functional groups, Aliphatic and aromatic hydrocarbones.

II- WATER AND ACID – BASE EQUILIBRIA

- Water as a solvent, water is nucleophilic, interaction of biomolecules with water, forces stabilizing biomolecules, polar and non-polar, hydrophobic and hydrophilic molecules.
- Dissociation of water: ion product of water.
- Acid – Base equilibrium: dissociation of a weak acids, pH and pKa, titration of weak acids, Henderson-Hasselbach equation.
- Buffers: Regulation of blood pH, physiological buffers.
- Role of liver, Kidney and lung in regulation of blood pH, imbalances of blood pH (alkalosis and acidosis).

III- CHEMISTRY OF AMINO ACIDS AND PROTEINS

- Function of proteins.
- Amino acids: Structure, optical activity, amphoteric properties, chemical, nutritional and metabolic classification of amino acids.
- Peptides and polypeptides: formation of peptide bond and polypeptide chain, conformation of proteins (primary, secondary tertiary and quaternary structures), separation methods of proteins.
- Digestion and absorption of proteins and clinical correlations.

IV- CHEMISTRY OF CARBOHYDRATES AND PHYSIOLOGIC IMPORTANCE

- Biomedical importance.
- Carbohydrate functions, nomenclature, classification and structures, glycosidic linkages, cyclization and isomerization of monosaccharides, derivatives of monosaccharides (sugar phosphate, deoxysugars, sugar alcohol, sugar acid and ascorbic acid). Reducing and non reducing disaccharides.
- Polysaccharides: homopolysaccharides and heteropolysaccharides.
- Glycoconjugate: Proteoglycans, Glycoproteins and Peptidoglycans. Digestion and absorption of carbohydrates and clinical correlations.

V- NUCLEOTIDES AND NUCLEIC ACIDS

- Structures and functions of purines and pyrimidines, nucleosides and nucleotides, nucleotides derivatives, nucleotide triphosphate and group transfer potentials, polynucleotides. Nucleic acids are polymer of nucleotides, DNA and RNA structure, function, types, and properties.

TEACHING AND LEARNING METHODS:

- Lectures

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm 20%
- Final 80%

LIST OF REFERENCES:

1. Lecture notes of teaching staff.
2. Robert K. Murray. Harper's Biochemistry, 31st edition.
3. Denise R. Ferrier. Lippincott's illustrated reviews, 6th edition.

INTRODUCTION OFPHYSIOLOGY (PS120)

BASIC INFORMATION:

Title	**Introduction of Physiology**
Code	PS120
Units	2 units - 2 hours/week
Duration	14 week
Prerequisites:	Admission exam

OBJECTIVES OF THE COURSE:

By the end of the course, the studend will be able to:

1. Understand the cell morphology and functional organization of the human body, and the control of internal environment.
2. Understand the physiology of sympathetic, parasympathetic, autonomic nervous system, structure and function of nerve cells and deferent types of nerve fibers.
3. Understand the Membrane Potentials and Action Potentials.
4. Understand the structural differences and similarities among skeletal muscle, smooth muscle, and cardiac muscle, and the role of neural and hormonal control in muscles.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Describe the cell morphology and functional organization of the human body, and the control of enternal environment.
2. Describe the physiology of thesympathetic, parasympathetic, and autonomic nervous system.
3. Describe the structure and function of nerve cells, and different types of nerve fibers.
4. Identify the Membrane Potentials and Action Potentials.
5. Describe the structural differences and similarities among skeletal muscle, smooth muscle, cardiac muscle, and the role of neural and hormonal control in muscles.

B. INTELLECTUAL SKILLS

1. Discuss the cell morphology and functional organization of the human body, and the control of the internal environment.
2. Discuss the physiology of the sympathetic, parasympathetic and autonomic nervous system.
3. Discuss the structure and function of nerve cells, and different types of nerve fibers.
4. Discuss the Membrane Potentials and Action Potentials.
5. Discuss the structural differences and similarities among skeletal muscle, smooth muscle, cardiac muscle, and the role of neural, and hormonal control in muscles.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Demonstrate the ability to identify the cell morphology and functional organization of the human body, and the control of the internal environment.
2. Demonstrate the ability to identify the physiology of sympathetic, parasympathetic and autonomic nervous system.
3. Demonstrate the ability to identify the structure and function of nerve cells and different types of nerve fibers.
4. Demonstrate the ability to identify the Membrane Potentials and Action Potentials
5. Demonstrate the ability to identify the structural differences and similarities among skeletal muscle, smooth muscle, cardiac muscle and, the role of neural and hormonal control in muscles.

D. GENERIC AND TRANSFERABLE SKILLS

1. Work effectively in teams.
2. Manage time effectively.
3. Lifelong learning.
4. Respect collogues.

COURSE CONTENT:

I- INTRODUCTION

- Functional morphology of cell membrane and transport of substances across the cell membrane. Body fluid: Its composition and compartments - Forces

responsible for movement of substances between compartments. Homeostasis and internal environment - Control mechanism - PH and buffers - Osmolality and osmotic pressure of body fluid - Units of measurement of solute concentration.

II- AUTONOMIC NERVOUS SYSTEM

- Subdivisions of autonomic nervous system: Sympathetic and Para-sympathetic systems afferent autonomic fibers - Autonomic ganglia. Chemical transmission and autonomic functions - Cholinergic fibers - Cholinergic receptors (muscarinic and nicotinic) - Cholinesterase and anticholinestrase. Acetylcholine antagonists (atropine and curare) - Epinephrine and norepinephrine Alpha and Beta receptors. Higher control of autonomic nervous system: Sympathetic integration with adrenal medulla - Hypothalamic control.

III- PHYSIOLOGY OF NERVE AND MUSCLE

- Structure and function of nerve cell. – Resting membrane potential Na+ - K + electrogenic pump. Types of nerve fibers and their functions – Properties of mixed nerves – Velocity of conduction in nerve fibers- Chronaxie – Rheobase.
- Action potential and its propagation. Spike potential. Structure and functions of different types of muscle tissues. Differences between skeletal, smooth and cardiac muscles. Neuromuscular transmission – End plate potential – Drugs affecting neuromuscular junction- Myasthenia gravis.
- Isotonic and isometric contractions – Muscular fatigue – Tetanus – Twitch and clonus - Muscular atrophy and hypertrophy. Source of energy for muscle contraction and role of calcium. Function of smooth muscle – Types of smooth muscle – Contractile process and neuromuscular junction in smooth muscle.

TEACHING AND LEARNING METHODS:

- Lectures

ASSESSMENT METHODS:

Total: 100 marks
Midterm 30%
Final exam 70%

LIST OF REFERENCES:

1. Department: Lecture Notes in Medical Physiology
2. Guyton & Hall, Textbook of Medical Physiology
3. William F. Ganong, Review of Medical physiology

INTRODUCTION OFHISTOLOGY (HS120)

BASIC INFORMATION:

Title	**Introduction of Histology**
Code	HS120
Units	2 units – 3 hours / week
Duration	14
Prerequisites:	Admission exam

OBJECTIVES OF THE COURSE:

By the end pf the course, the student will be able to:

1. Understand the essential information on histological Microtechniques.
2. Understand the basic structure, the function of the cell, the basic molecular aspects of certain cellular and tissue components (Membrane, Cytoskeleton, Matrix).
3. Identify different types of basic tissues (epithelium, connective tissue, muscle, and nervous tissues).
4. Describe special types of connective tissue.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Identify different types of microscopes and tissue processing technique.
2. Describe the basic structure of the cell, and cell division.
3. Describe the histological structure of epithelial tissue.
4. Describe the structure and component of connective tissue.

B. INTELLECTUAL SKILLS

1. Compare different types of microscopes and tissue processing technique.
2. Recognize the basic histological structure of cell and cell division.
3. Discuss the histological structure of the epithelium tissue.
4. Discuss the histological structure and the component of connective tissue.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Recognize the tissue processing, and using microscopes to identify cells and tissues.
2. Demonstrate the cell structure and different organelles.
3. Identify the histological structure of the epithelium tissue.
4. Identify the histological structure of the connective tissue.

D. GENERAL AND TRANSFERABLE SKILLS

1. Possess the ability to use a computer, to search for information related to the course.
2. Use critical thinking and problem-solving skills when addressing information, concepts and theories related to the course.
3. Self- learning ability.
4. Manage time effectively.

COURSE CONTENT:

I. MICROTECHNIQUES OF HISTOLOGY

- **Preparation of Tissues for Study**
  - Fixation.
  - Embedding & Sectioning.
  - Staining.
- **Light Microscopy**
  - Bright-Field Microscopy.
  - Fluorescence Microscopy.
  - Phase-Contrast Microscopy.
  - Confocal Microscopy.
  - Polarizing Microscopy.
- **Electron Microscopy**
  - Transmission Electron Microscopy.
  - Scanning Electron Microscopy.
- **Cell & Tissue Culture**
- **Enzyme Histochemistry.**
- **Visualizing Specific Molecules.**
  - Immunohistochemistry.
  - Hybridization Techniques.

II. THE CELL STRUCTURE

- **The plasma membrane**
  - Transmembrane Proteins & Membrane Transport.
  - Transport by Vesicles: Endocytosis & Exocytosis.
  - Signal Reception & Transduction.
- **Cytoplasmic organelles**
  - Ribosomes.
  - Endoplasmic Reticulum.
  - Golgi apparatus.
  - Secretory Granules.
  - Lysosomes.
  - Proteasomes.
  - Mitochondria.
  - Peroxisomes.
  - The Cytoskeleton.
  - Microtubules.
  - Microfilaments.
  - Intermediate Filaments.

III. THE NUCLEUS AND CELL DIVISION

- **Components ofthe Nucleus**.
  - Nuclear Envelope.
  - Chromatin.
  - Nucleolus.
- **The Cell Cycle.**
- **Mitosis.**
- **Meiosis.**
- **Apoptosis**.

IV. EPITHELIUM TISSUE

- **Characteristic Features of Epithelial Cells.**
  - Basement Membranes.
  - Intercellular Adhesion & Other Junctions.
- **Specializations of theApical cell Surface.**
  - Microvilli.
  - Stereocilia.
  - Cilia.

- **Types of Epithelia.**
  - Covering or Lining Epithelia.
  - Secretory Epithelia & Glands.
- **Transport across Epithelia.**
- **Renewal of Epithelial Cells.**

V. CONNECTIVE TISSUE

- **Cells of Connective Tissue.**
  - Fibroblasts.
  - Adipocytes.
  - Macrophages &theMononuclear Phagocyte System.
  - Mast Cells.
  - Plasma Cells.
  - Leukocytes.
- **Fibers**
  - Collagen.
  - Reticular Fibers.
  - Elastic Fibers.
- **Ground Substance.**
- **Types of Connective Tissue.**
  - Connective Tissue Proper.
  - Reticular Tissue.
  - Mucoid Tissue.

TEACHING AND LEARNING METHODS:

- Direct lectures.
- Lab lectures.
- Electronic materials.

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm 20%
- lab 20%
- Final 60%

LIST OF REFERENCES:

1. A.L. Mescher, 2013, Junqueira's Basic Histology Text and Atlas 13th Ed. McGraw Hill, New York.
2. Eroshenko, 2010,Di Fiore atlas of histology, Eleventh Edition., Lippincott, Williams & Wilkins.

GENERAL ANATOMY (AN120)

BASIC INFORMATION

Title	**General Anatomy**
Code	AN120
Units	2 units - 2 hours/week
Duration	14 weeks
Prerequisites:	Admision exam

OBJECTIVES OF THE COURSE:

By the end of the course the student will be able to:-

1. Use essential terminology required to describe the fundamental structure of the human body.
2. Describe the relationship between different structures in the human body.
3. Describe the anatomical components of the human body including skin, cartilages, ligaments, and blood vessels.

INTENDED LEARNING OUTCOMES:

A. KOWLEDGE AND UNDERSTANDING

1. Identify essential terminology required to describe the fundamental structure of the human body.
2. Describe the relationship and the orientation of different structures in the human body.
3. Describe the anatomical components of the human body including skin, cartilages, ligaments, and blood vessels.

B. INTELLECTUAL SKILLS

1. Discus essential terminology required to describe the fundamental structure of the human body.
2. Analyze the relationship and the orientation of different structures in the human body.

3. Discus the anatomical components of the human body including skin, cartilages, ligaments, and blood vessels.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Use essential terminology required to describe the fundamental structure of the human body.
2. Use the relationship and the orientation of different structures in the human body.
3. Use the anatomical components of the human body including skin, cartilages, ligaments, and blood vessels.

C. GENERAL AND TRANSFERABLE SKILLS

1. Self- learning ability.
2. Ability to work as a team and respect colleague's opinions.
3. Possess the ability to use a computer to search for information related to the course.

COURSE CONTENT:

- Definition of anatomy, history of anatomy, importance of anatomy, methods used to study anatomy.
- Body plans.
- Basic anatomical Terms related to positions**.**
- Basic anatomical terms related to movements**.**
- Skin.
- Fascia and muscles.
- Bone.
- Cartilage.
- Joints.
- Ligaments, bursa, Mucous membranes, serous membranes.
- Blood vessels, lymphatic, nervous tissue.

TEACHING AND LEARNING METHODS:

- Lectures

ASSESSMENT METHODS:

- Total: 100 marks
- Written midterm, 30%
- Final written exam, 70%

LIST OF REFERENCES:

1. Course Notes: Lecture Notes by staff members.
2. Clinical anatomy for medical student's.Richard S. Snell.
3. Atlas of Human Anatomy.

MEDICAL PHYSICS (MP130)

BASIC INFORMATION:

Title	**Medical Physics**
Code	MP130
Units	3 units - 3hours/week
Duration	14
Prerequisites:	Admision exam

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Understane the general concepts of medical physics, and its role in medicine.
2. Develop problem-solving and critical-thinking skills in medical physics.
3. Integrate and apply various physics concepts to real-life medical physics problems.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Describe the concepts and propertiesof matter in medical physics.
2. Recognize the theories and general principles of heat, and the mechanism of regulation of body temperature.
3. Describe the basics of sound waves, and the medical applications of ultrasonic.
4. Describe the principles of light waves, mirrors, and lenses, and defects associated with vision.
5. Describe the Ionizing radiation and the biological effects of radiation.

B. INTELLECTUAL SKILLS

1. Discuss the concepts and property of matter in medical physics.
2. Explain the theories and general principles of heat, and the mechanism of regulation of body temperature.
3. Discuss the basics of sound waves, and the medical applications of ultrasonic.

4. Discuss the principles of light waves, mirrors and Lenses, and defects associated with vision.
5. Discuss the Ionizing radiation, and the biological effects of radiation.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Demonstrate the ability to identify concepts, and propertiesof matter in medical physics.
2. Demonstrate the ability to theories and general principles of heat, and the mechanism of regulation of body temperature.
3. Apply the basics of sound waves, and the medical applications of ultrasonic.
4. Demonstrate the ability to identify principles of light waves, mirrors and Lenses, and defects associated with vision.
5. Apply the Ionizing radiation, and the biological effects of radiation.

D. GENERAL AND TRANSFERABLE SKILLS

1. Gain the ability to self and continuous learning.
2. Effectively use mathematical and physical models, systems, and tools
3. Practice scientific thinking and problem-solving skills.
4. Work within the framework of ethics and scientific traditions.

COURSE CONTENT:

I. Properties of Matter

- **Pressure:**
  i. Fluid Pressure, Pressure Units and Instruments.
  ii. Blood Pressure.
- **Static Fluids:**
  i. Pascal's Principle, Archimedes Principle.
  ii. Surface Tension and Capillarity.

- **Fluid Dynamics:**
  i. Ideal fluid, Continuity Equation, and Bernoulli's Equation.
  ii. Poiseuille's Law, Circularity System.

II. Heat

- Temperature: Scales and Thermometers.

- Heat and Energy: Quantity of Heat, Change of Phase, and Thermal Equilibrium.
- Transfer of Heat: Conduction, Convection, and Thermal Radiation.
- Regulation of Body Temperature.

III. Sound Waves

-Classifications of Waves.

-Mechanical Waves:

i. Wave Motion and Characteristics of Waves.
ii. Wave Interference and Standing Waves.

- Acoustic Phenomena:
  i. Sound Intensity and Sound Intensity Level.
  ii. Ear and Hearing.
- Ultrasound: Properties of Ultrasound and Acoustic Impedance.
- Medical Application: Doppler Effect.

IV. Light Waves

-Electromagnetic Waves:

i. Light Reflection and Refraction.
ii. Internal Reflection and Fiber Optics.

-Mirrors and Lenses.

-Eye and Vision Defects.

V. Modern Physics and Nuclear Medicine

- Atomic Structure and Electromagnetic Radiation.
- Atomic Nucleus and Nuclear Binding Energy.
- X-rays:
  i. Production and Properties.
  ii. Imaging and Biological Effects of X-rays.

-Radioactivity:

i. Nuclear Radiation.
ii. Radioactive Decay.
iii. Radiation Doses.
iv. Biological Effects and Application of Radiation.

TEACHING AND LEARNING METHODS:

- Lectures.

ASSESSMENT METHODS:

- Total: 100 marks
- Written midterm, 30%
- Final written exam, 70%

LIST OF REFERENCES:

1. R. Serway, “Principle of Physics”.
2. Martin Hollins, “Medical Physics”.
3. Nave and Nave, “Physics of the Health Sciences”.
4. Herman Cember and Thomas E. Johnson, “Introduction to Health Physics”.

English I (EL121)

BASIC INFORMATION:

Title	**English I**
Code	EL121
Units	2 units - 2 hours/week
Duration	14
Prerequisites:	Admision exam

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Understand the medical language needed in their medical career.
2. Master the professional language needed to communicate with their future patients and other medical workers as well.

INTENDED LEARNING OUTCOMES:

A-KNOWLEDGE AND UNDERSTANDING

1. Identify hospital departments, hospital staff, and types of equipment.
2. Describe different parts of the human body including the circulatory system, the respiratory system and the digestive system.
3. Describe the adverb frequency.
4. Describe first aid steps and steps to maintain hygiene.
5. Identify medical terminologies and basic medical abbreviations.
6. Describe measurements and the methods of administering medication.

B-INTELLECTUAL SKILLS

1. Distinguish between different hospital departments, and staff related to specific medical conditions.
2. Differentiate between different systems and parts of the body.
3. Discuss adverb frequency.
4. Discuss first aid steps and how to maintain hygiene.
5. Identify medical terminologies and basic medical abbreviations.
6. Discuss measurements and the methods of administering medication.

C- PRACTICAL AND PROFESSIONAL SKILLS

1. Differentiate between different hospital departments, and staff related to specific medical conditions.
2. Identify different systems and parts of the body.
3. Identify adverb frequency.
4. Demonstrate first aid steps and how to maintain hygiene.
5. Identify medical terminologies and basic medical abbreviations.
6. Identify measurements and the methods of administering medication**.**

D-GENERAL AND TRANSFERABLE SKILLS

1. Work effectively in a group or team to achieve goals.
2. Augment their awareness of correct usage of English grammar in writing, and speaking.
3. Speak and write clearly and dynamically in a variety of situations.
4. To be able to convey technical terminology, and to communicate with others as well.
5. Manage time effectively.

COURSE CONTENT:

Tutorial	Lab	Lecture	Hours	Title	Week
-	-	**2**	**2**	Hospital Department	**.1**
-	-	**2**	**2**	Hospital Staff	**.2**
-	-	**2**	**2**	Hospital Equipment	**.3**
-	-	**2**	**2**	Parts of the Body 1-2	**.4**
-	-	**2**	**2**	Parts of the Body 3	**.5**
-	-	**2**	**2**	Respiratory system	**.6**
-	-	**2**	**2**	Circulatory System	**.7**
-	-	**2**	**2**	Digestive System	**.8**
-	-	**2**	**2**	Describing Frequency	**.9**
-	-	**2**	**2**	First Aid	**.10**
-	-	**2**	**2**	Maintaining Hygiene	**.11**
-	-	**2**	**2**	Common Abbreviations	**.12**
-	-	**2**	**2**	Measurements	**.13**
-	-	**2**	**2**	Administering Medication	**.14**
28				**Total**	

TEACHING AND LEARNING METHODS:

- Lectures
- Homework and networking

ASSESSMENT METHODS:

Assessment Method	Time	Allocated marks
Mid term	Sixth week	25%
Homework/Report	After midterm	5%
Final Exam	At the end of the term	70%

LIST OF REFERENCES:

1. Career Paths. Evans, Virginia, et al. Express Publishing.
2. Grammar in Use.Hewings, Martin. Cambridge University Press.
3. WWW.BBC Learning English.com

ARABIC LANGUAGE (AL120)

BASIC INFORMATION:

Title	**Arabic language**
Code	AL120
Units	2 units – 2 hours/week
Duration	14
Prerequisites:	Admision exam

أهـداف المقرر:

1. لربط الطالب باللغةالعربية الفصحى،وتراثها،ونتاجهاالفكري،والعلمي.
2. رفع كفاءةالطالب في اللغةالعربيةمن حيث التخاطب والكتابة.
3. اكتساب الطالب المهارة في توظيف اللغةالعربيةفي المعارف المختلفة وتذوقه للنواحي الجمالية في النصوص الأدبية.
4. تزويدالطالب بالمهارات اللغويةالمتقدمة لتعينه على فهم مايتلقاه من علوم ومعارف،وتمكنهم من التعبيرالسليم.
5. تقويم اللسان والقلم من الأخطاءالشائعة في الكتابة والخطابة،وذلك بتدريبهم على الإملاء الموافق للقواعد والأصول. الفنية،والارتقاءبملكاتهم في نطق الحروف من مخارجها.
6. ترسيخ المصطلح العلمي ومبادئ الترجمةالعلمية.

مخرجات التعلم المستهدفة:

1. المعرفة والفهم
2. التعرف على عناصرالاتصال اللغوي .
3. معرفةالقواعد الإملائية وعلامات الترقيم.
4. معرفةالقواعدالنحوية والصرفية.
5. التعريف بأبرز المصنفات اللغوية والأدبية .
6. معرفةأصول وطرق الكتابة.
7. معرفةمبادئ الترجمة.
8. التعرف على المعاجم اللغوية.

ب . المهارات الذهنية:

1. القدرة على كتابة التقارير والنصوص - .
2. القراءة المعاصرة للنصوص اللغوية والأدبية.
3. يفسر دلالة الألفاظ في النص ، ويعبر عن الموقف الواحد بأساليب مختلفة شفهيا ، وكتابيا.

4. يوازن بين سمات اللغة المنطوقة واللغة المكتوبة.
5. القدرة على ترجمة النصوص إلى العربية.
6. تطبيق المفاهيم البلاغية، لإبراز سماتها .
7. البحث في المعاجم.

ج. المهارات العملية والمهنية:

1. إتقان الكتابةوالتعبير باستخدام اللغةاستخداماً صحيحاً .
2. قراءةالنصوص الأدبيةوكتابتهاوفق المعاييرالنحوية والصرفية.
3. تحصيل المعارف والمعلومات والقدرة على استخلاص النتائج .
4. كتابةالتقاريروالمقالات وإلقاءالخطب والمحاضرات وحلقات النقاش.
5. التعبيرالشفوي وفن الإلقاءفي الميدان المهني والمناسبات العامة.
6. توظيف أدوات البحث العلمي في كتابةالأبحاث العلمية.
7. استخدام المعاجم اللغوية .

د-المهارات العامة والمنقولة:

1. غرس القيم والمثل والمبادئ والالتزام بأخلاقيات المهنة.
2. أن يكون الطالب قادراعلى الاتصال والتواصل التحريري والشفوي .
3. تنميةالرغبةفي القراءةوالقدرةعلى تذوق المقروء ونقده بأساليبه وأفكاره.

محتوى المقرر:

الموضوع العلمي	عدد الساعات	محاضرة	معمل	تمارين
المهارات اللغوية				
عناصر اللغة العربية وخصائصها .	2	1	-	-
الكلام وما يتألف منه .	2	1	-	-
البناء والإعراب .	2	1	-	-
الجملة (تعريفها، أقسامها ، تركيبها).	2	1	-	-
التوابع .	2	1	-	-
بعض الأساليب النحوية .	2	1	-	-
قواعد الأملاء.	2	1	-	-
علامات الترقيم في الكتابة العربية.	2	1	-	-
معالجة بعض الأخطاء الشائعة .	2	1	-	-
الكتابة وفنون التعبير				
النثر وأنواعه .	2	1	-	-

الكتابة العلمية وخصائصها .	2	1	-	1
كيفية كتابة التقارير .	2	1	-	1
المعاجم والمصطلحات				
أنواع المعاجم	2	1	-	-
التعريب والترجمة نصوص تطبيقية (قراءة بعض النصوص المتصلة بالتخصص واعادة كتابة المادة العلمية مما درس سابقاً)	2	1	-	1
المجموع	28			

طرق التعليم والتعلم:

- محاضرات.
- تدريبات
- حلقات النقاش

طرق التقييم:

ت	طرق التقييم	تاريخ التقييم	النسبة المئوية
1	امتحان نصفي	حسب الجدول المعد من قسم الدراسة والامتحانات	%25
3	أعمال السنة	بعد نهاية كل جزء من مفردات المنهج	%5
4	امتحان نهائي		%70
المجموع		%100	

المراجع والدوريات:

عنوان المراجع	الناشر	المؤلف	مكان تواجدها
مذكرات المقرر	استاذ المقرر	أستاذ المقرر	الجامعة
الكتب الدراسية المقررة	دروس في قواعد اللغة العربية	د. المبروك بالحاج	الجامعة
كتب مساعدة	الشامل في اللغة العربية	د. عبدالله محمد النقراط	الجامعة
مواقع إنترنت	موقع اللغة العربية تعلما وتعليما		

2- SECOND SEMESTER

Subject title	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Biochemistry I	BC141	4	3	2	1	BC120
Physiology I	PS141	4	3	2	1	PS120
Histology I	HS141	4	3	2	1	HS120
Anatomy and embryology I	AN131	3	2	2	1	AN120
English language II	EL122	2	2	0	0	EL121
Total		**17**	**13**	**8**	**4**	

BIOCHEMISTRY I (BC141)

BASIC INFORMATION

Title	**Biochemistry I**
Code	BC141
Units	4 units - 6 hours/week
Duration	14 weeks
Prerequisites:	BC120

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Understand the chemistry of lipids, and their physiological importance.
2. Explaine how enzymes increases biochemical reactions, the and role of coenzymes and cofactors.
3. Understand the chemistry, biosynthesis, and clinical importance of vitamins.
4. Understand know the importance of nutrition and body fluids.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Describe different lipid classes including their structures, and functions.
2. Describe the biomedical importance of enzymes, and their catalytic activity regulation and deficiency.
3. Describe the importance and biological roles of vitamins, and coenzymes.
4. Describe plasma proteins and immunoglobulins.

5. Describe nutrition and body fluids

B. INTELLECTUAL SKILLS

1. Discuss different lipid classes including their structures, and functions.
2. Discuss the biomedical importance of enzymes and their catalytic activity, regulation and deficiency.
3. Discuss the importance and biological roles of vitamins, and coenzymes.
4. Discuss plasma proteins and immunoglobulins.
5. Discuss nutrition and body fluids.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Identify different lipid classes including their structures, and functions.
2. Identify the enzymes and their catalytic activity, regulation and deficiency.
3. Demonstrate the biological roles of vitamins, and coenzymes.
4. Identify plasma proteins and immunoglobulins.
5. Identify nutrition, and body fluids.

D.GENERAL AND TRANSFERABLE SKILLS

1. To encourage students to manage time and work effectively in a groups.
2. Become familiar in interpreting results and examining reports.
3. Self- learning ability.
4. Apply safety rules relevant to practical techniques.
5. Apply biochemical principle techniques.

COURSE CONTENT:

I. CHEMISTRY OF LIPIDS OF PHYSIOLOGIC IMPORTANCE

- Biomedical importance.
- Lipids definition, functions, structures and classification (simple, complex and derived lipids). Fatty acids: nomenclature, general properties and classification (chemical and nutritional). Triacyglycerols, phospholipids and glycolipids.
- Steroids: definition, structure and function. Lipid peroxidation. Separation and identification of lipids. Digestion and absorbance of lipids and clinical correlation.

II.VITAMINS AND COENZYMES

- Definition, structures, active forms, functions and classification, sources, transport, requirements, deficiency and toxicity of water - soluble and fat – soluble vitamins. Coenzymes classification, metabolic and vitamin derived coenzymes, e.g ubiquinone (coenz - Q), protein coenzymes (cytochromes and thioredoxin).

III.ENZYMES

- Biomedical importance. General concept: definition, nomenclatures, general properties, structure, distribution, proenzymes, enzyme classification according to structure and reaction they catalyze, enzyme cofactors. Enzyme activity: enzyme unit, specific activity, turnover number, enzyme assay, enzyme specificity, active site. Enzyme catalysis: proximity, strain, covalent and acid – base catalysis. Factors affecting enzyme activity, Michaelis- Menten equation, Km significance, Lineweaver-Burk plot of enzyme activity. Enzyme inhibition: irreversible inhibitors, general and specific inhibitors, reversible enzyme inhibition (competitive, non comp. and uncomp.), clinical applications of enzyme inhibition. Regulation of enzyme activity (allosteric, reversible covalent modification and regulation by control proteins (calmodulin). Isozymes: examples, separation and clinical application.

IV.PLASMA PROTEINS AND IMMUNOGLOBULINS

- Immunoglobulins definition, structure, types and functions. Plasma proteins biosynthesis, degradation and separation. Major plasma protieins, albumin, glubulins, acute phase proteins and other plasma Proteins.

VI. BODY FLUIDS AND NUTRITION

- Body fluids (intracellular and extracellular), composition in health and disease.
- Nutrition: Dietary reference intake, energy requirements in human, energy content of food, resting metabolic rate, thermic effect of food, physical activity.
- Dietary fats: dietary fat and plasma lipids, relation with coronary heart disease.
- Dietary carbohydrates: requirements, dietary carbohydrates and blood glucose.
- Dietary proteins: quality of proteins, nitrogen balance, requirements of proteins, protein caloric malnutrition (Kwashiorker and Marsmus). Mineral and trace elements: body minerals, functions, ranges, toxicity and deficiency symptoms.

TEACHING AND LEARNING METHODS:

- Lectures
- Tutorials
- Practical

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm: 20%
- Practical:10%
- Final written exam:70%

LIST OF REFERENCES:

1. Robert K. Murray. Harper's Biochemistry, 31st edition
2. Denise R. Ferrier. Lippincott's illustrated reviews, 6thedition
3. Gaw et al. Clinical Biochemistry.
4. Ashour S. Eljamil. Lipid biochemistry for medical sciences.

PHYSIOLOGY I (PS141)

BASIC INFORMATION

Title	**Physiology I**
Code	PS141
Units	4 units – 6 hours/week
Duration	14 weeks
Prerequisites:	PS120

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Recognize deferent parts and physiological functions, and some pathophysiological changes of gastrointestinal tract.
2. Recognize the deferent parts and physiological functions, and some pathophysiological of hepaobiliary system.
3. Recognize the component and the physiological functions, and some pathophysiology of blood and reticulo-endothelial system.
4. Recognize the mechanism of homeostasis and blood coagulation.
5. Recognize the functions of the respiratory system, and understand the mechanisms by which these functions are carried out.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Describe different parts, physiological functions, and some pathophysiological changes of the gastrointestinal tract
2. Describe different parts, physiological functions and some pathophysiological changes of hepatobiliary system
3. Describe the physiological function of the main components of blood and related disorders and define blood groups.
4. Describe the mechanism of homeostasis and blood coagulation.
5. Describe the structure and physiological function of therespiratory system.
6. Recognize the mechanism of neural regulation of respiration versus chemical regulation.

B. INTELLECTUAL SKILLS

1. Discuss different parts, physiological functions and some pathophysiological changes of gastrointestinal tract.
2. Discuss different parts, physiological functions and some pathophysiological changes of hepatobiliary system
3. Discuss the physiological functions of the main components of blood and related disorders and define blood groups.
4. Discuss the mechanism of homeostasis and blood coagulation.
5. Discuss the structures and physiological functions ofthe respiratory system.
6. Discuss the mechanism of neural regulation of respiration versus chemical regulation.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Demonstrate different parts, physiological functions, and some pathophysiological of the gastrointestinal tract.
2. Demonstrate different parts, physiological functions, and some pathophysiological of the hepatobiliary system.
3. Demonstrate the physiological functions of the main components of blood and related disorders and define blood groups.
4. Evaluate hematological tests related to blood coagulation.
5. Identify the structures and physiological functions of therespiratory system.
6. Demonstrate the mechanism of neural regulation of respiration versus chemical regulation.

D. GENERAL AND TRANSFERABLE SKILLS

1. Work effectively in teams.
2. Manage time effectively.
3. Demonstrate the ability to use the computer for effective presentation.
4. Lifelong learning.
5. Respect collogues.
6. Practice self and peer evaluation.

COURSE CONTENT:

I. GASTRO-INTESTINALAND HEPATOBILIARY SYSTEMPHYSIOLOGY

1.1- Functional anatomy of gastro-intestinal tract.
1.2- Salivary glands – Composition and function of saliva – Mechanism of salivary secretion.
1.3- Mastication and deglutition.
1.4- Stomach– Nerve supply and functions – Gastric glands and their secretion – Emptying of stomach – Peptic ulcer.
1.5- Vomiting – Mechanism and consequences of vomiting.
1.6- GIT mobility – Types, function and mechanism.
1.7- Pancreas – Pancreatic juice – secretion and regulation – Secretin CCK – PZ.
1.8- Small intestine – Intestinal secretion – Gastro-ileac reflex.
1.9- Liver and biliary system – Functions of liver – Composition of bile salts and their functions – Enterohepatice circulation of bile salts and bile acids – bile pigments and their metabolism – Gall bladder – Jaudice.
1.10- Absorption in the various parts of the GIT – Factors affecting absorption - mechanism of absorption – Malabsorption syndromes.
1.11- Large intestine – Absorption of water and salts – Gastrocolic and duodenocolic reflexes – Mucous secretion – Defecation.
1.12- Gastrointestinal hormones and their functions

II. BLOOD AND IMMUNITY

2.1- Composition and function of blood.
2.2- Red blood cells:
Production of RBC – Types and formation of haemoglobin – Iron metabolism – Destruction of RBC – Anaemia and Jaudice – Polycythaemia.
2.3-White blood cells:
Genesis and properties different types and their functions – Reticulo-endothelial system – Leukocytosis – Leukopenia – Leukemia.
2.4- Plasma proteins: Types – Origin and functions.
2.5- Blood groups and blood transfusion (A, B, O) bloods: Blood typing - Transfusion reaction - Rh blood groups - Rh immune response - Erythroblastosis fetalis.
2.6- Hemostasis and blood coagulation: Events of hemostasis and mechanism of blood coagulation - Coagulation test - Haemophilia.
2.7- Immunity and allergy: Types of acquired immunity - Role of lymphoid tissues – Vaccination - Passive immunity - Allergy.

III . RESPIRATORY PHYSIOLOGY

3.1- Definition – Structure – Symbols – Laws – Measurement of gas volumes and concentrations.

3.2- Pleural and intrapleural pressure – Lung volumes – Static lung compliance – Chestwall compliance – Total thoracic compliance

3.3- Types of airflow – Airway resistance – Work of breathing.

3.4- Dead spaces – Alveolar ventilation – Distribution of inspired gas – Regional ventilation – Physiologic factors influencing distribution – Diffusion.

3.5- Blood flow in lungs – Regional distribution of blood flow – Causes of uneven distribution of blood flow – Control of pulmonary blood flow.

3.6- Oxygen transport – Cyanosis – Oxygen in solution – Oxyhemoglobin dissociation curve – Carbon dioxide transport – Combined oxygen and carbon dioxide transport in blood.

3.7- Ventilation – Perfusion ratio and its abnormalities.

3.8- Respiratory rhythm – Voluntary control of muscles of breathing – Respiratory reflexes – Chemical control of breathing.

3.9- Effect of exercise on ventilation – Oxygen debt – Hypoxia – Asphyxia

PRACTICAL SYLLABUS:

The practical classes include the following:

I- BLOOD:

1. Determination of bleeding time.
2. Determination of coagulation time.
3. Determination of Packed Cell Volume (PCV).
4. Determination of hemoglobin content.
5. Determination of Erythrocyte Sedimentation Rate (ESR).
6. Determination of blood groups.
7. Calculation of blood indices.

II- RESPIRATION

1. Static lung volumes and capacities.
2. Forced Vital Capacity and timed Vital Capacity (FVC ,FEV_1)
3. Peak expiratory flow rate (PEFR).

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorials.
- Practical.

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm 20%
- Practical 15%
- Final written exam 65%

LIST OF REFERENCES:

- Department Lecture Notes in Medical Physiology.
- Guyton & Hall**.** Textbook of Medical Physiology.
- William F. Ganong**.** Review of Medical physiology**.**

HISTOLOGY I (HS141)

BASIC INFORMATION:

Title	**Histology I**
Code	HS 141
Units	4 units – 6 hours/week
Duration	14 weeks
Prerequisites:	HS120

OBJECTIVES OF THE COURSE:

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

1. Understand the basic structure and functions of genetic materials.
2. Recognize the histological structure of connective tissue, and their microscopic structure.
3. Recognize the histological structure of the muscular tissue, and their microscopic structure.
4. Recognize the histological structure of the central nervous system, and their microscopic structure**.**
5. Recognize the histological structure of skin, bone, the cartilage, and their microscopic structure.
6. Recognize the histological structure of circulatory system, the blood, the hematopoiesis, and their microscopic structure.
7. Recognize the histological structure of immune system and lymphoid organs**.**

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Describe the structure and function of genetic materials.
2. Describe the histology of connective tissue.
3. Describe the histology of muscular tissue.
4. Describe the histological structure of nervous tissue.
5. Describe the histological structure of the skin, bone and cartilage.
6. Describe the histological structure of the circulatory system, the blood and the hematopoiesis.

7. Identify the histological characteristics of the immune system and lymphoid organs.

B. INTELLECTUAL SKILLS

1. Discuss the normal structure and functions of DNA and RNA.
2. Discover the histological structure of the connective tissue.
3. Discuss the histological structural of the muscular tissue.
4. Discuss the histological structure of the nervous tissue.
5. Discuss the histological structure of the skin, bone, and cartilage.
6. Discuss the histological structure of the circulatory system, the blood, and haematopoiesis.
7. Discover the histological characteristics of the immune system and lymphoid organs.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Use the basic principle of genetics.
2. Identify and describe the histological structure of the connective using proper microscope technique.
3. Identify the histology of the muscular tissue by using microscope.
4. Identify and describe the histological structure of the nervous tissue by using microscope.
5. Identify and describe the histological structure of the skin, bone, and cartilage by microscopic examination.
6. Demonstrate the structure of the circulatory system, the blood, and haematopoiesis.
7. Identify and describe the histological characteristics of the immune system, and lymphoid organs by microscopic examination.

D. GENERAL AND TRANSFERABLE SKILLS

1. Possess the ability to use a computer to search for information related to the course.
2. Uses critical thinking and problem solving skills when addressing information, concepts and theories related to the course.
3. Self- learning ability.
4. Manage time effectively.
5. Respect colleagues.
6. Working within the team.

7. Listening and communication.

COURSE CONTENT:

- **GENETICS**
  - DNA structure.
  - Chromosome organization.
  - Gene structure.
  - DNA replication.
  - DNA transcription.
  - DNA translation.
  - DNA mutation and repair.
  - DNA recombination.

- **BLOOD AND HEMATOPOIESIS**
  - Composition of Plasma.
    - Blood Cells.
      - Erythrocytes.
      - Leukocytes.
      - Platelets.
  - Stem Cells, Growth Factors, & Differentiation.
    - Hemopoietic Stem Cells.
    - Progenitor & Precursor Cells.
  - Bone Marrow.
  - Maturation of Erythrocytes.
  - Maturation of Granulocytes.
  - Maturation of Agranulocytes.
    - Monocytes.
    - Lymphocytes.
  - Origin of Platelets.

- **CARTILAGE**
  - Hyaline Cartilage.
    - Matrix.
    - Chondrocytes.
    - Perichondrium.
  - Elastic Cartilage.
  - Fibrocartilage.
  - Cartilage Formation, Growth, & Repair.

- **BONE**
    - Bone Cells.
        - Osteoblasts.
        - Osteocytes.
        - Osteoclasts.
    - Bone Matrix.
    - Periosteum & Endosteum.
    - Types of Bone.
        - Lamellar Bone.
        - Woven Bone.
    - Osteogenesis.
    - Intramembranous Ossification.
    - Endochondral Ossification.
    - Bone Remodeling & Repair.

- **NERVOUS TISSUE**
    - Development of Nerve Tissue.
    - Neurons.
        - Cell Body.
        - Dendrites.
        - Axons.
        - Nerve Impulses.
        - Synaptic Communication.
    - Glial Cells & Neuronal Activity.
        - Oligodendrocytes.
        - Astrocytes.
        - Ependymal Cells.
        - Microglia.
        - Schwann Cells.

- **MUSCLE TISSUE**
    - Skeletal Muscle.
        - Organization ofA Skeletal Muscle.
        - Organization within Muscle Fibers.
        - Sarcoplasmic Reticulum &Transverse Tubule System.
        - Mechanism of Contraction.
        - Innervation.
        - Muscle Spindles & Tendon Organs.
        - Skeletal Muscle Fiber Types.

- Cardiac Muscle.
- Smooth Muscle.Satellite Cells of Ganglia.

- **CIRCULATORY SYSTEM**
  - Heart.
  - Tissues ofthe Vascular Wall.
  - Vasculature.
    - Elastic Arteries.
    - Arterial Sensory Structures.
    - Muscular Arteries.
    - Arterioles.
    - Capillary Beds.
    - Venules.
    - Veins.
  - Lymphatic Vascular System.

- **IMMUNE SYSTEM AND LYMPHOID ORGANS**
  - Innate & Adaptive Immunity.
  - Cytokines.
  - Antigens & Antibodies.
    - Classes of Antibodies.
    - Actions of Antibodies.
  - Antigen Presentation.
  - Cells of Adaptive Immunity.
    - Antigen-Presenting Cells.
    - Lymphocytes.
  - Thymus.
    - Role ofthe Thymus in T-Cell Maturation & Selection.
  - Mucosa-Associated Lymphoid Tissue.
  - Lymph Nodes.
    - Role of Lymph Nodes inthe Immune Response.
  - Spleen.
    - Functions of Splenic White & Red Pulp.
- **SKIN**
  - Epidermis.
    - Melanocytes.
    - Langerhans Cells.
    - Merkel Cells.

- Dermis.
- Subcutaneous.
- Sensory Receptors.
- Hair.
- Nails.
- Skin Glands.
  - Sebaceous Glands.
  - Sweat Glands.
  - Mucoid Tissue.

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorials
- Practicle
- Electronic materials.

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm 20%
- lab 20%
- Final 60%

LIST OF REFERENCES:

1. A.L. Mescher, 2013, Junqueira's Basic Histology Text and Atlas 13th EdMcGraw Hill, New York.
2. Eroshenko, 2010,Di Fiore atlas of histology, Eleventh Edition., Lippincott, Williams & Wilkins.

ANATOMY AND EMBRYOLOGY I (AN131)

BASIC INFORMATION:

Title	**Anatomy and Embryology I**
Code	AN131
Units	3units- 5 hours/week
Duration	14 weeks
Prerequisites:	AN120

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Describe the pectoral region, axilla, and back musculature.
2. Describe the anatomical structure of the upper limb including the bones of the arm, forearm, wrist, and hand.
3. Describe the blood supply of the upper limb.
4. Describe the nerve supply of the upper limb.
5. Define embryology and explain the stages of embryo development.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Describe the pectoral region, axilla, and back musculature.
2. Describe the rotator cuff and anatomical space and arterial anastomosis.
3. Describe the anatomy of the forearm and wrist region.
4. Identify the joint, the nerve, and blood supply to the upper limb, and hand anatomy.
5. Describe the stages of embryo development.

B. INTELLECTUAL SKILLS

1. Discuss the Pectoral region, the axilla, and back musculature.
2. Discuss the rotator cuff and anatomical space and arterial anastomosis.
3. Discuss the anatomy of the forearm and wrist region.
4. Discuss the joint anatomy, the nerve, and blood supply to the upper limb, and hand anatomy.

5. Discuss the stages of embryo development.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Apply the anatomy of Pectoral region, axilla, and back musculature.
2. Use e the rotator cuff anatomy and anatomical space and arterial anastomosis.
3. Demonstrate the anatomy of forearm and wrist region.
4. Demonstrate anatomy of the joint, the nerve, and blood supply to the upper limb and hand anatomy.
5. Determine the stages of embryo development.

D. GENERAL AND TRANSFERABLE SKILLS

1. Use a computer to search for information related to the course.
2. Possess the ability to give presentations.
3. Ability to work as a team.
4. Self- learning ability.
5. Respect colleagues' opinions.

COURSE CONTENT:

1. Bones of upper limb

2. Pectoral region:

- Breast.
- Muscles.

3. Axilla:

- Inlet, Walls, contents (brachial plexus, axillary artery, axillary vein, axillary lymph vessels and nodes, maxillary process of the breast).

4. Back musclature

5. Rotator cuff Muscles

- Supraspinatus, infraspinatus, teres minor, subscapularis.

6. Anatomical spaces (Quadrungular, triangular):

- Boundaries and structures passing through.

7. Arterial anastomosis

8. Joints:

- Sternoclavicular joint.
- Acromioclavicular joint.
- Shoulder joint.
- Scapular- Humera mechanism.

9. The upper arm

10. The forearm

11. The wrist region

- Anterior structure of the wrest.
- Posterior structure of the wrest.

12. Joints of the upper limb

13. Nerves of the upper limb

14. Blood supply to the upper limb

15. The hand

16- General Embryology

1. Gametogenesis (spermatogenesis and oogenesis).

Uterine cycle (phases).

2. Reproductive cycles:

Ovarian cycle (phases and hormonal control).

3. First week of development:

Fertilization: Site, Transport of ovum and sperm, Result.
Cleavage: Definition, Stages.
Significance of zona pellucid**.**
Blastocyst formation.

4. Implantation:

Definition, Steps of implantation, Site of implantation.
The second week.
Bilaminar germ disc.
Trilaminar germ disc.

5. Derivatives of the germ layers (ectoderm, endoderm and mesoderm).
6. Fetal membranes, and placenta.
7. Congenital malformation (causes).

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorial.
- Practical.

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm 20%
- Practical 30%
- Final written exam 50%

LIST OF REFERENCES:

1. R.S. Snell. Clinical Anatomy for Medical Student, 9th ed

ENGLISH II (EL122)

BASIC INFORMATION

Title	**English II**
Code	EL 122
Units	2 units - 2 hours / week
Duration	14
Prerequisites:	EL121

OBJECTIVES OF THE COURSE:

By the of the course, the student will be able to:

1. Recognize and produce spoken and written language in order to effectively interact with patients, and other medical staff.
2. Identify written and oral medical English when requesting to take patient's history.
3. Identify written and oral medical English when requesting use of diagnostic tests, or equipment.
4. Understand the different medical conditions in different specialties.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Memorize more medical language used in authentic communicative medical situations.
2. Describe different parts ofthe human body including blood, bones, skin, nervous, endocrine, urinary, and reproductive systems.
3. Identify medical language and steps in history taking from patients.
4. Recall the medical terms used in talking about symptoms
5. Describe different diagnostic tests and diagnostic equipment.
6. Define the features of other specialties in medicine such as family medicine, geriatric, and pediatrics using good English language.

B. INTELLECTUAL SKILLS

1. Use the medical language skillfully and accurately.
2. Differentiate between different systems and parts of the body.
3. Interpret medical language correctly in history taking.
4. Discuss symptoms using medical terms.
5. Distinguish between different diagnostic tests and diagnostic equipment.
6. Discuss the features of other specialties in medicine such as family medicine, geriatric, and pediatrics using good English language.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Use medical English and communication.
2. Distinguish between different systems and parts of the body.
3. Use medical language correctly in history taking.
4. Apply medical terms in talking about symptoms.
5. Identify different diagnostic tests and diagnostic equipment.
6. Identify the features of other specialties in medicine such as family medicine, geriatric, and pediatrics using good English language.

D. GENERAL AND TRANSFERABLE SKILLS

1. To be able to work and communicate correctly with both patients and other medical workers successfully.
2. Master the medical language used in the medical field.
3. Listen effectively.
4. Work effectively in a group or team to achieve goals.
5. Manage time effectively.

COURSE CONTENT:

Tutorial	Lab	Lectures	Hours	Title	Week
-	-	**2**	**2**	Blood	**1**
-	-	**2**	**2**	Bones	**2**
-	-	**2**	**2**	Skin	**3**
-	-	**2**	**2**	Nervous System	**4**
-	-	**2**	**2**	Endocrine System	**5**
-	-	**2**	**2**	Reproductive System	**6**
-	-	**2**	**2**	Urinary System	**7**
-	-	**2**	**2**	Taking A History	**8**
-	-	**2**	**2**	Talking about Symptoms and Examinations.	**9**
-	-	**2**	**2**	Diagnostic Tests	**10**
-	-	**2**	**2**	Diagnostic Equipment	**11**
-	-	**2**	**2**	Family Medicine	**12**
-	-	**2**	**2**	Pediatrics	**13**
-	-	**2**	**2**	Geriatrics	**14**
28				Total	

TEACHING AND LEARNING METHODS:

- Lectures
- Homework and networking

ASSESSMENT METHODS:

AssessmentMethod	Time	Allocated marks
Mid term	Sixth week	25%
Homework/Report	After midterm	5%
Final Exam	At the end of the term	70%

LIST OF REFERENCE:

1. Career Paths. Evans, Virginia, et al. Express Publishing.
2. Grammar in Use.Hewings, Martin. Cambridge University Press.
3. WWW.BBC Learning English.com

THIRD SEMESTER

Subject title	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Biochemistry II	BC142	4	3	2	1	BC141
Physiology II	PS142	4	3	2	1	PS141
Histology II	HS142	4	3	2	1	HS141
Anatomy II	AN132	3	2	2	1	AN131
English language III	EL123	2	2	0	0	EL122
Total		**17**	**13**	**8**	**4**	

BIOCHEMISTRYII (BC142)

BASIC INFORMATION

Title	**Biochemistry II**
Code	BC142
Units	4 units – 6 hours /week
Duration	14 weeks
Prerequisites:	BC141

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be to:

1. Understand the biological importance of digestion and absorption of carbohydrates, lipid, protein, purines, and pyrimidines and explain their metabolism, and regulation.
2. Discuss the integration and regulation of the major metabolic pathways.
3. Understand the components of the electron transport chain (E.T.C), location, components, energy span, redox span of E.T C, and inhibitions of E.T.C.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Describe the digestion and absorption process and the transportation of dietary including; carbohydrates, lipids, proteins, purines, and pyrimidines.
2. Describe the metabolism of carbohydrate, lipids, proteins, purines and pyrimidines.

3. Describe the relationship between the major metabolic pathways, and metabolic regulations.
4. Describe the pathways impairments e.g, defects in fructose metabolism (essential fructosuria, hereditary fructose intolerance, fructose (sorbitol and diabetic cataract), and enzyme defects in galactose metabolism (galactosemia).
5. Describe the biological oxidation, free energy and oxidation reduction potential (redox potential) and the electron transport chain (E.T.C), the location, the components, the energy span, the redox span of E.T C, and inhibitions of E.T.C.

B. INTELLECTUAL SKILLS

1. Discuss the digestion and absorption process and the transportation of dietary including carbohydrates, lipids, proteins, purines, and pyrimidines.
2. Discuss the metabolism of carbohydrates, lipids, proteins, purines, and pyrimidines.
3. Describe the relationship between the major metabolic pathways and metabolic regulations.
4. Discuss the pathways impairments e.g., defects in fructose metabolism (essential fructosuria, hereditary fructose intolerance, fructose (sorbitol and diabetic cataract), and enzyme defects in galactose metabolism (galactosemia).
5. Discuss the biological oxidation, free energy, oxidation reduction potential (redox potential), and the electron transport chain (E.T.C), the location, the components, the energy span, and the redox span of E.T C, and inhibitions of E.T.C.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Identify the digestion and absorption process and the transportation of dietary including; carbohydrates, lipids, proteins, purines, and pyrimidines.
2. Identify the metabolism of carbohydrate, lipids, proteins, purines and pyrimidines.
3. Distinguish between the relationship between the major metabolic pathways and metabolic regulations.
4. Identify the pathways impairments e.g, defects in fructose metabolism (essential fructosuria, hereditary fructose intolerance, fructose (sorbitol and diabetic cataract), and enzyme defects in galactose metabolism (galactosemia).
6. Demonstrate the ability to identify the biological oxidation, free energy, oxidation reduction potential (redox potential), and the electron transport chain (E.T.C), the location, the components, the energy span, and the redox span of E.T C, and inhibitions of E.T.C.

D. GENERAL AND TRANSFERABLE SKILLS

1. Work constructively and cooperatively as a team.
2. Manage time effectively.
3. Work safely in a laboratory.

COURSE CONTENT:

CARBOHYDRATE METABOLISM

I. **Digestion and absorption of carbohydrates** transport of glucose and rate of absorbed sugars.

- Insulin, receptors and glucose transporters.

-Glycolysis (aerobic and anaerobic), free energy.

II. **Changes of glycolysis**, alternative fate of pyruvate, regulation of glycolysis.

- Clinical aspects impairment of pyruvate metabolism and lactic acidosis, pyruvate kinase deficiency.

III. **The citric acid cycle:** entry of pyruvate to mitochondrion, conversion of pyruvate to actetyl CoA (PDH complex)

PDH complex regulation, oxidationof actyl-CoA, free energy changes of citric acid cycles and its relation to E.T.C, regulation of citric acid cycle, pivotal role of citric acid cycle in metabolism

IV. **Glycogen metabolism:** synthesis and degradation of glycogen in liver and muscles, hormonal regulation of glycogen phosphorylase and synthase, glycogen storage diseases.

VI. **Gluconeogenesis:** reaction and regulation of gluconeogenesis (hormonal, substrate availability and allosteric).

VI. **The pentose phosphate pathway** and other pathways for hexoses:

reactions of the pathway, uses of NADPH, role of glucose-6-p dehydrogenase and its deficiency, regulation of pentose phosphate pathway, the reciprocal regulation of glycolysis and gluconeogenesis.

- Uronic acid pathway.
- Metabolism of fructose and galactose
- Clinical aspects, erythrocytes hemolysis in pentose phos. Pathway impairment, defects in fructose metabolism (essential fructosuria, hereditary fructose intolerance, fructose (sorbital and diabetic cataract), enzyme defects in galactose metabolism (galactosemia).

VII**. Regulation of blood glucose:** Metabolic and hormonal regulation, hyperglycaemia, diabetes mellitus (types, symptoms and treatment) hypoglycaemia, the renal threshold of glucose, glucose tolerance test.

LIPID METABOLISM

I. **Digestion, absorption and fate of dietary lipids**, defects in lipid digestion (steaterrhae and chylurea).

II. **Fatty acid synthesis and ecosonoids**:
Sources of actyle –coA and its transport to the cytosol, sources, sources of NADPH, formation of malonyl-co A, fatty acid synthesis complex reaction. Microsomal and mitochondrial systems of fatty acid elongation, synthesis of unsaturated fatty acid. Regulation of fatty acid synthesis, storage of fatty acid as components of TAG (fate of TAG in liver and adipose tissues). Essential fatty acids deficiency. Eicosonoids synthesis and physiological actions.

III**. Fatty acid oxidation and keton bodies:**
- Mobiliation of stored fats; release of fatty acids, hormone sensitive lipase, fate of glycerol and fatty acid. Fatty acid oxidation, fatty acid transport into mitochondria.
- β – oxidationof fatty acids, β – oxidation of unsaturated and odd chain fatty acids, energy yield from fatty acids oxidation, peroxisomal oxidation of fatty acids.
- Regulation of fatty acid oxidation. Disorders of impaired fatty acid oxidation: Zellweget disease, Refsum disease, Carnitine and Palmitoyl transferase deficiency, dicarboxilic aciduria. Keton bodies formation: Synthesis of keton bodies (ketogenesis), utilization of keton bodies (ketolysis).- Regulation of ketogenesis, importance of ketone bodies and energy yield from their oxidation, exclusive ketogenesis (ketosis) and diabetes mellitus (metablic change, symptoms and management).

IV. **Complex lipids metabolism:**
-Phospholipid synthesis (phosphatidyl ethanolamine, phosphotidyl choline, phosphotidyl serine, phosphotidylinositol synthesis.
-phosphotidylglycerol, cardiolipin, sphingomylin sphingomylin degradation.
Glycolipids, disorderof phospholipids metabolism, demyelination disease (multiple sclerosis) respiratory distress syndrome, lipid storage disease (sphingolipidosis).

V. **Lipid transport (lipoprotein metabolism):**
- Plasma lipoprotein; classification, site of formation and function, apolipoproteins, structure and function, lipoprotein lipase, tissue distribution, activation and deficiency.

VI**. Cholesterol metabolism:**
- Cholesterol function biosynthesis and its regulation. Plasma lipoproteins and transport of cholesterol function of bile acids, enterohepatic circulation of bile, function of bile acids, cholelthiasis.

- Plasma cholesterol normal range, hyper- and hypo- cholesterolemia.
-Serum cholesterol and atherostorosis and coronary heart disease, life style, diet and cholesterol levels, hypolipidemic drugs- Fatty liver (causes and management), liptropic factors. List factors for atherosclerosis and heart disease.

PROTEIN AND AMINO ACIDS METABOLISM

Protein turnover, digestion and transport of dietary proteins. Transport of amino acids, γ – glutemyl cycle for amino acid transport. Biosynthesis of nutritionally non-essential amino acids.

Catabolism of proteins and of amino acid nitrogen, protein turnover, biosynthesis of urea, reactions of urea cycle, regulation of urea cycle and metabolic disorders of urea cycle. Ammonia formation, transport and toxicity. Nitrogen balance. Catabolism of the carbon skeletons of amino acid. Transamination, oxidative deamination, transmethylation,decaroboxylation reaction of amino acid. Conversion of glucogenic amino acids into pyruvate. Conversion of ketogenic amino acids into acetyl – CoA.

Metabolic disorders associated with glycine metabolism. Conversion of amino acids to specialized bioproducts. Inborn error of amino acid metabolism (PKU), albinism.

Alkaptonuria, cyctinuria (homocystinuria) hartnap disease, maple syrup urine disease

METABOLISM OF PURINES AND PYRIMIDINES

Digestion and absorption of dietary nucleoproteins and nucleic acids Synthesis of 5-phosphoribosyl-1-pyrophosphates (PRPP). Biosynthesis of purine nucleotides and its regulation, salvage pathway for purine nucleotides, reduction of ribonucleoside diphosphate to deoxyribonucleotide diphosphate. Degradation of purine nucleotides. Biosynthesis of pyrimidine nucleotides and its regulation, salvage pathway for pyrimidine. Degradation of pyrimidine nucleotides. Inhibitors of purine and pyrimidine metabolism and their clinical applications. Diseases associated with defects of purine and pyrimidine metabolism; Gout, lesch- Nyhan syndrome, Von Gierk's disease, orotic aciduria and immunodeficiency disorder (adenosine deaminase deficiency and purine nucleoside phosphorylase deficiency).

BIOENERGITICS

Free energy, endorganic reactions (anabolism), exorganic endorganic reactions, other high energy compound, sources of ATP. Biological oxidation, free energy and oxidation reduction potential (redox potential). The electron transport chain (E.T.C), location, components, energy span and redox span of E.T C, inhibitions of E.T.C. Oxidative phosphorylation, chemiosmotic theory, inhibition of oxidative phosphorylation, uncouplers (chemical and natural). Aerobic oxidation of cytosolic NADH, Glycerol phosphate and malate aspartate shuttle. Transfer of energy from mitochondria; the creatine shuttle.

INTEGRATION OF METABOLISM

Metabolism; catabolism and anabolism, stages of metabolism; digestion and absorption, building of biomolecule in cytoplasm (anabolism) and catabolic stage in mitochondria. Metabolic fuels, fed, fasting, refed and starvation states. Strategy of metabolism; ATP, reducing power and building blocks. Metabolic regulation: non hormonal and hormonal regulation. Major metabolic pathways regulation and control sites (glycolysis, citric acid cycle, gluconeogensis, pentose phosphate pathway, glycogen synthesis and degradation, fatty acid synthesis and breakdown. Hormonal regulation of metabolic pathways; insulin, glucagons and epinephrine. Metabolic key junctions; pyruvate, acetyl-CoA and glucose-G-phosphate. Metabolism of specialized tissues: liver, heat, brain, skeletal muscles, adipose tissues, kidney. Diabetes mellitus.

TEACHING AND LEARNING METHODS:

- Lecture
- Tutorial
- Practical

ASSESSMENT METHODS:

- Total: 100 marks
- Mid term 20%
- Practical 10%
- Final 70%

LIST OF REFERENCES:

1. Robert K. Murray. Harper's Biochemistry, 31st edition
2. Denise R. Ferrier. Lippincott's illustrated reviews, 6th edition
3. Gaw et al. Clinical Biochemistry.
4. Ashour S. Eljamil. Lipid biochemistry for medical sciences.

PHYSIOLOGYII (PS142)

BASIC INFORMATION

Title	**Physiology II**
Code	PS142
Units	4 units - 6 hours /week
Duration	14 weeks
Prerequisites:	PS141

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Understand different parts, physiological functions, and pathophysiology of the renal system.
2. Understand the different parts, physiological functions, and pathophysiology of the heart.
3. Understand different types of specific circulation, the importance of cardiovascular response to exercise, and the physiology of shock.
4. Understand the Electrocardiogram (ECG), and its importance as aninvestigation tool in medicine.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Describe different parts, physiological functions, and common pathophysiological changes of the renal system.
2. Describedifferent parts, physiological functions, and common pathophysiological changes of the heart.
3. Describe different types of specific circulation, and the importance of cardiovascular response to exercise, as well as the physiology of shock.
4. Outline the components of an ECG tracing in the micturition reflex and outline micturition abnormalities (loss of the reflex).

B. INTELLECTUAL SKILLS

1. Discuss different parts, physiological functions, and common pathophysiological changes of the renal system.
2. Discuss different parts, physiological functions and common pathophysiological changes of the heart.
3. Discuss different types of specific circulation, and the importance of cardiovascular response to exercise, as well as the physiology of shock.
4. Discuss the components of ECG tracing.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Demonstrate ability to identify the different parts, the physiological functions, and common pathophysiologi calchanges of therenal system
2. Demonstrate ability to identify the different parts, the physiological functions, and common pathophysiological changes of the heart
3. Demonstrate ability to identify the different types of specific circulation, and the importance of cardiovascular response to exercise, as well as the physiology of shock.
4. Analyze the components of the electrocardiogram (ECG) tracing, and know the normal and common abnormal conditions on ECG.

D. GENERAL AND TRANSFERABLE SKILLS

1. Work effectively in teams.
2. Manage time effectively.
3. Respect collogues.
4. Lifelong learning.

COURSE CONTENT:

A- LECTURES / TUTORIALS

I. CARDIOVASCULAR PHYSIOLOGY

1.1- Electrophysiology of cardiac muscle – Contraction of cardiac muscle

1.2- Origin and conduction of cardiac impulse – Special conductive tissues of the heart

1.3- Cardiac cycle: Phases of cardiac cycle , systole and diastole, relationships between heart rate and cardiac cycle – Pressure and volume changes in the

atria, in the ventricles and aorta – Jugular venous pressure – Heart sounds and their cause.

1.4- Cardiac output and venous return- Definitions of stroke volume, EDV, ESV ,and cardiac index – Factors affecting cardiac output - Preload and afterload- Ejection fraction- Vagal escape

1.5- Regulation of cardiac function –Extrinsic regulation (Neural control, sympathetic and parasympathetic)- Intrinsic regulation (Frank-Starling law of the heart, heterometric and homeometric regulation) – Effect of ions on heart.

1.6- Electrocardiogram: Characteristics of normal ECG – Various waves and intervals – Unipolar, bipolar and chest leads – Cardiac vector – Mean electrical axis of the ventricle – Interpretation of ECG – Abnormal rhythms of the heart – Ectopic pacemakers – Premature and escape ventricular beats - Heart blocks (1^{st}, 2^{nd}, 3^{rd} degree AV blocks and BBB) - Rapid arrhythmias (atrial and ventricular tachycardias) – Flutter and fibrillation - Ventricular hypertrophy- Ischemia and infarction.

1.7- Hemodynamics: Pressure, flow , resistance, and their inter-relationship (Poiseuille's law) – Hematocrit and resistance – Vascular compliance - Flow, velocity versus cross sectional area and their inter-relationship – Reynold's number - Turbulent flow and murmurs.

1.8- Systemic circulation: Arterial and venous pressures– Effect of gravity (Postural effect on arterial and venous pressures) - Distribution of blood in the various compartments- Control of the circulation (regulation of blood flow to the different vascular beds) – Neural and metabolic local control of blood flow – Metabolic and myogenic hypothesis - Control of the cardiovascular center by higher brain centers- Vasomotor center –. Sympathetic tone- Sympathetic vasodilator system-.Vasovagal syncope (emotional fainting) - Capillary circulation - Capillary dynamics and formation of tissue fluid – Starling forces - Edema. Function of the lymphatic system and mechanism of lymph flow.

1.9- Blood pressure and its regulation: Normal values of different pressures- Factors affecting blood pressure– Mean arterial blood pressure – Mean pulmonary pressure - Measurement of arterial blood pressure – Regulation of blood pressure – Neural regulatory mechanisms - Chemoreceptors and Baroreceptors – Baroreflex – CNS ischemic reflex – Humoral regulatory mechanism – Renin-angiotensin system.

1.10- Specific circulation:

Pulmonary circulation: Blood pressure in various segments of the lung – Effect of posture – Ventilation perfusion ratio– Pulmonary edema.

Coronary circulation: Unique features of coronary circulation– Control of coronary blood flow – Ischemic heart disease (angina pectoris, myocardial ischemia and infarction).

Cerebral circulation: Regulation of cerebral blood flow.

Cutaneous circulation: Control of skin blood flow–Temperature induced vasodilatation and vasoconstraction.

1.11 - Hypertension- Circulatory shocks: Definition and signs of shock – Different types of shocks -Mechanism of shock – Compensatory responses.

1.12- Heart Failure: Left ventricular failure and right ventricular failure.

1.13- Cardiovascular responses to exercise (in anticipation and during exercise): Changes in heart rate, stroke volume, cardiac output, blood pressure and total peripheral resistance.

II. RENAL PHYSIOLOGY

2.1- Functional anatomy of the kidney - Cortical and juxtamedullary nephrons - Blood supply of a nephron - Juxtaglomerular apparatus - Basic renal processes (filtration, reabsorbtion, and secretion) - Major functions of the kidney.

2.2- Glomerular filtration - Structure of glomerular membrane - Determinants of glomerular filtration rate (GFR) - Dynamics of GFR - Measurement of GFR - Autoregulation of GFR.

2.3- Plasma clearance - Calculation of plasma clearance - The Fick principle - Its application to assess renal functions - Filtration fraction - Clearance of inulin for GFR - Clearance of PAHA for RPF - Transport maximum.

2.4- Tubular functions - Composition of glomerular filtrate - Tubular reabsorption - Renal handling of water - Role of antidiuretic hormone - Tubular secretion (active secretion of H^+ and passive secretion of K^+ ions; secretion of NH_3) - Tubular mechanism for reabsorption of Na^+, K^+; H_2O; HCO_3^-; urea and glucose.

2.5- Renal conservation of Na^+; Na^+ reabsorption by active process and cotransport mechanism - Na^+ transport in the distal nephron segments - Aldosterone and its action - The rennin; angiotensin; aldosterone system - Glomerulotubular balance.

2.6- Renal handling of K^+ (Potassium balance); whole body distribution of K^+; Factors affecting K^+ excretion.

2.7- Mechanism of formation of concentrated and diluted urine - Changes in osmolarity of the filtrate in various parts of nephron - The medulllary hyperosmolarity - The cortico-medullary gradient for total solute concentration - Medullary blood flow - Urea recirculation; Renal handling of urea - The countercurrent mechanism - Osmolar clearance and free water clearance.

2.8- Diuresis and action of diuretics - Water diuresis and osmotic diuresis - Effect of ICF and ECF volume receptors on ADH release - Carbonic anhydrase inhibitors - Furosemide.

2.9- Micturation - Functional anatomy of urinary bladder - Cystemetrogram during bladder filling - Micturation reflex and control by higher centre - Abnormalities of micturation - Overflow incontinence - Spastic neurogenic bladder.

B- PRACTICAL:

Each student takes a practical class of 2 hours/week. The practical classes include the following:

CARDIOVASCULAR SYSTEM

1- Heart:

a. ECG: Understanding the concept of calibration and paper speed, recording of ECG from limb leads and chest leads, measurement of the duration of the different waves and ECG intervals, and interpretation of normal ECG.
b. Determination of the cardiac vector.
c. Calculation of heart rate.

2- CIRCULATION:

a. Measurement of the systolic and diastolic blood pressure.
b. Calculation of the pulse pressure and mean arterial blood pressure.

TEACHING AND LEARNING METHODS:

- Lectures
- Tutorials
- Practical

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm 20%
- Practical 15%
- Final 65%

LIST OF REFERENCES:

- Department : Lecture Notes in Medical Physiology
- Guyton & Hall**.** Textbook of Medical Physiology
- William F. Ganong**.** Review of medical physiology

HISTOLOGY II (HS142)

BASIC INFORMATION:

Title	**Histology II**
Code	HS 142
Units	4 units - 6 hours / week
Duration	14 weeks
Prerequisites:	HS141

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able:

1. Understand the histological structure of the nervous system.
2. Identify the histological structure of the digestive tract and its organs.
3. Understand the histological structure of the respiratory and urinary systems.
4. Understand the histological structure of the male, and female reproductive systems.
5. Understand the basic histological structure of the endocrine system, and sense organs.

INTENDED LEARNINGOUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the histology of the nervous system tissues.
2. Recognize the histology of the digestive tract, and its organs.
3. Describe the structure of the respiratory system.
4. Describe the structure of the urinary system.
5. Describe the histology of the male reproductive system.
6. Describe the histology of the female reproductive system.
7. Identify the localization and the histological characteristics of the endocrine system, and sense organs.

B. INTELLECTUAL SKILLS

1. Recognize the histology of nervous system tissues.
2. Discuss the histology of the digestive tract, and its organs.
3. Discuss the structure of the respiratory system.

4. Discuss the structure of the urinary system.
5. Discuss the histology of the male reproductive system.
6. Discuss the histology of the female reproductive system.
7. Discover the localization and the histological characteristics of the endocrine system and sense organs.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Use a microscope to identify the histological structure of the nervous tissue.
2. Demonstrate the histological structure of the digestive tract, and its organs.
3. Demonstrate the histological structure of the respiratory system.
4. Demonstrate the histological structure of the urinary system.
5. Demonstrate the histology of the male reproductive system.
6. Demonstrate the histology of female reproductive system.
7. Demonstrate the localization, and the histological characteristics of the endocrine system, and sense organs.

D-GENERAL AND TRANSFERABLE SKILLS

1. Possess the ability to use a computer to search for information related to the course.
2. Uses critical thinking andproblem-solving skills when addressing information, concepts and theories related to the course.
3. Self- learning ability.
4. Practice self and peer evaluation.
5. Communicate well with colleagues and teachers.
6. Manage time effectively.
7. Work constructively and cooperatively within a team.

COURSE CONTENT:

- **NERVOUS SYSTEM**
    - Central Nervous System.
        - Meninges.
        - Blood-Brain Barrier.
        - Choroid Plexus.
    - Peripheral Nervous System.
    - Nerve Fibers.
    - Nerve Organization.

        - Ganglia.
    - Neural Plasticity & Regeneration.

- **DIGESTIVE TRACT**

    - General Structure of the Digestive Tract.
    - Oral Cavity.
        - Tongue.
        - Teeth.
        - Dentin.
    - Esophagus.
    - Stomach.
        - Mucosa.
        - Other Layers.
    - Small Intestine.
        - Mucosa.
        - Other Layers.
    - Large Intestine.
    - Organs Associated with the Digestive Tract.
        - Salivary Glands.
        - Pancreas.
        - Liver.
            - Hepatocytes & Hepatic Lobules.
            - Structure & Function inthe Liver.
        - Biliary Tract & Gallbladder.

- **RESPIRATORY SYSTEM**.

    - Nasal Cavities.
        - Respiratory Epithelium.
        - Olfactory Epithelium.
        - Paranasal Sinuses.
    - Pharynx.
    - Larynx.
    - Trachea.
    - Bronchial Tree & Lung.
        - Bronchi.
        - Bronchioles.
        - Respiratory Bronchioles.

    - Alveolar Ducts.
    - Alveoli.
  - Regeneration in the Alveolar Lining.
  - Lung Vasculature & Nerves.
  - Pleural Membranes.
- **URINARY SYSTEM**

  - Kidneys.
  - Blood Circulation.
  - Renal Function: Filtration, Secretion, & Reabsorption.
    - Renal Corpuscles & Blood Filtration.
    - Proximal Convoluted Tubule.
    - Loop Of Henle
    - Distal Convoluted Tubule & Juxtaglomerular Apparatus.
  - Collecting Ducts.
  - Ureters.
  - Bladder.
  - Urethra.

- **MALE REPRODUCTIVE SYSTEM**

  - Testes.
    - Interstitial Tissue.
    - Seminiferous Tubules.
    - Spermatogenesis.
    - Spermiogenesis.
    - Sertoli Cells.
  - Intratesticular Ducts.
  - Excretory Genital Ducts.
  - Epididymis.
  - Vas Deferens.
  - Accessory Glands.
  - Seminal Vesicles.
  - Prostate Gland.
  - Bulbourethral Glands.
  - Penis.

- **FEMALE REPRODUCTIVE SYSTEM**
  - Ovaries.
    - Early Development ofthe Ovary.
    - Ovarian Follicles.
    - Follicular Growth & Development.
    - Follicular Atresia.
    - Ovulation & Its Hormonal Regulation.
    - Corpus Luteum.
  - Uterine Tubes.
  - Uterus.
    - Myometrium.
    - Endometrium.
    - Menstrual Cycle.
    - Proliferative Phase.
    - Secretory Phase.
    - Menstrual Phase.
  - Embryonic Implantation, Decidua&the Placenta.
  - Cervixand Vagina.
  - External Genitalia.
  - Mammary Glands.
    - Breast development during Puberty.
    - Breasts during Pregnancy & Lactation.
    - Postlactational Regression inthe Mammary Glands.

- **ENDOCRINE SYSTEM**
  - Pituitary Gland.
  - Adrenal Glands.
  - Pancreatic Islets.
  - Diffuse Neuroendocrine System.
  - Thyroid Gland.
  - Parathyroid Glands.
  - Pineal Gland.

- **SENSE ORGANS**
  - Eyes.
    - Fibrous Layer.
    - Vascular Layer.
    - Lens.
    - Vitreous Body.
    - Retina.

        - Accessory Structures ofthe Eye.
    - Ears.
        - External Ear.
        - Middle Ear.
        - Internal Ear.

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorials.
- Practicle.
- Electronic materials.

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm 20%
- lab 20%
- Final 60%

LIST OF REFERENCES:

1. A.L. Mescher, 2013, Junqueira's Basic Histology Text and Atlas 13th Ed McGraw Hill, New York.
2. Eroshenko, 2010,Di Fiore atlas of histology, Eleventh Edition., Lippincott, Williams & Wilkins.

ANATOMY II (AN132)

BASIC INFORMATION

Title	**Anatomy II**
Code	AN132
Units	3 units – 5 hours /week
Duration	14 week
Prerequisites:	AN131

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:-

1. Describe the locations and the appearance of the thoracic wall, and intercostal space on plastinated cadaver.
2. Describe the anatomical structure of the thoracic cavity.
3. Describe the basic anatomical structure of the wall, inguinal canal, spermatic cord, and scrotum and testis.
4. Describe the abdominal viscera, and their blood and nerve supply.
5. Understand the basic embryology of the digestive system.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the anatomy of the thorax wall, and intercostal spaces.
2. Describe the anatomical structure of the thoracic cavity.
3. Describe the anatomy of the anterior abdominal wall and inguinal canal, the spermatic cord, the scrotum, and testes.
4. Describe the anatomy of the abdominal cavity.
5. Describe the development of the digestive system.

B.INTELLECTUAL SKILLS

1. Discuss the anatomy of the thorax wall, and intercostal space.
2. Discuss the anatomical structure of the thoracic cavity.
3. Discuss the anatomy of the anterior abdominal wall and inguinal canal,the spermatic cord, the scrotum, and testes.

4. Discuss the anatomy of the abdominal cavity.
5. Discuss the development of the digestive system.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Recognize the anatomy of the thorax wall and intercostal space on plastinated cadaver.
2. Recognize the anatomical structure of the thoracic cavity on plastinated cadaver.
3. Recognize the anatomy of the anterior abdominal wall, inguinal canal, spermatic cord, scrotum, and testis on plastinated cadevar.
4. Recognize the anatomy of abdominal cavity on plastinated cadevar.
5. Determine the development of the digestive system.

D.GENERAL AND TRANSFERABLE SKILLS

1. Possess the ability to use a computer to search for information related to the course.
2. Possess the ability to give presentations.
3. Ability to work as a team.
4. Self- learning ability.
5. Respect collegues opinions.

COURSE CONTENT:

I-THORAX

- Part 1: thoracic wall**.**
- Part 2: thoracic cavity, lungs and pleura.
- Heart**.**
- Mediastinum (superior& inferior).
- Trachea & oesophagus.
- Large arteries &veins and nerves of the thorax**.**

II- ABDOMEN

- Anterior abdominal wall.
- Peritoneum, Oesophagus (abdominal part)**.**
- Stomach. Small intestine: (duodenum, jejunum and ilium)**.**
- Large intestine**.**
- Liver and biliary system**.**
- Pancreas and spleen.
- Retroperitoneal space**.**

TEACHING AND LEARNING METHODS

- Lectures.
- References.
- Atlas.
- Modals.
- Plastinated cadaver.

ASSESSMENT METHODS

- Total: 100 marks
- Midterm 20%
- Practical 30%
- Final 50%

LIST OF REFERENCES:

1. Course Notes: Lecture Notes By staff members.
2. Clinical anatomy for medical students. Richard S. Snell.

ENGLISH III (EL123)

BASIC INFORMATION:

Title	**English III**
Code	EL 123
Units	2 units - 2 hours / week
Duration	14
Prerequisites:	EL122

OBJECTIVES OF THE COURSE:

By the end of the course, the student will able:

1. Identify the hospital culture concepts and communications.
2. Identify different medical problems.
3. Understand the practice in specialist vocabulary, and a review of basic and advanced grammatical structures.
4. Identify writing skills in good English language to describe patient's conditions, and medical reports.

INTENDED LEARNING OUTCOMES:

D. KNOWLEDGE AND UNDERSTANDIN

1. Memorize medical language is used in education and training.
2. Discover the medical terms used in communication with colleagues and patients.
3. Define the medical terms used in defining pain, chronic, acute illness, and traumatic injury.
4. Describe a solution of a medical problem as cancer, heart disease, and diabetes using grammar correctly.
5. Define other specialties in medicine such as nursing, infection, neurology, and surgery using good English language.

B.INTELLECTUAL SKILLS

1. Discuss education and training subjects using medical language.
2. Describe the medical terms used in communication with colleagues, and patients.
3. Describe chronic, acute illness, and traumatic injury using medical terminology.
4. Propose a solution to a medical problem such as cancer, heart disease, and diabetes using grammar correctly.
5. Identify other specialties in medicine such as nursing, infection, neurology, and surgery using good English language.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Identify themedical language used in Education & Training.
2. Use medical terms in communication with colleagues and patients.
3. Use medical terms in defining pain, chronic, acute illness, and traumatic injury.
4. Recommend a solution to a medical problemsuch as cancer, heart disease, and diabetes using grammar correctly.
5. Distinguish other specialties in medicine such as nursing, infection, neurology, and surgery using good English language.

D.GENERAL AND TRANSFERABLE SKILLS

1. Able to work and communicate correctly with both patients and other medical workers successfully.
2. Master the medical language used in the medical field.
3. Listen effectively.
4. Work effectively in a group or team to achieve goals.
5. Manage time effectivel

COURSE CONTENT:

Tutorial	Lab	Lectures	Hours	Title	Week
-	-	2	2	Education & Training	.1
-	-	2	2	Communicating with Staff and patients	.2
-	-	2	2	Challenges	.3
-	-	2	2	Describing Pain	.4
-	-	2	2	Chronic and Acute Illnesses	.5
		2	2	Traumatic Injuries	.6
-	-	2	2	Diabetes	.7
-	-	2	2	Heart Diseases	.8
-	-	2	2	Cancer	.9
-	-	2	2	Infections	.10
-	-	2	2	Nursing	.11
-	-	2	2	OB/GYN	.12
-	-	2	2	Neurology	.13
-	-	2	2	Surgery	.14
28				**Total**	

TEACHING AND LEARNING METHODS:

- Lectures
- Homework and networking

ASSESSMENT METHODS:

AssessmentMethod	Time	Allocated marks
Mid term	Sixth week	25%
Homework/Report	After midterm	5%
Final Exam	At the end of the term	70%

LIST OF REFERENCES:

1. Career Paths. Evans, Virginia, et al. Express Publishing.
2. Grammar in Use.Hewings, Martin. Cambridge University Press.
3. WWW.BBC Learning English.com

FOURTH SEMESTER

Subject title	Code	Unit	Lecture (	Practical	Tutorial	Prerequisites
Molecular biology	BC243	4	3	2	1	BC141
Physiology III	PS243	4	3	2	1	PS141
Anatomy III	AN233	3	2	2	1	AN 131,AN132
Microbiology and immunity I	MB241	4	3	2	1	BC142, PS142, HS141
Total		**15**	**11**	**8**	**4**	

MOLECULAR BIOLOGY (BC243)

BASIC INFORMATION:

Title	**Molecular Biology**
Code	BC243
Units	4 units – 6 hours / week
Duration	14 weeks
Prerequisites:	BC141

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Understand the nature of hormones and their biological roles.
2. Understand the basics of molecular biology and the transfer of genetic information from nucleic acid to protein synthesis, and cell function.
3. Understand the structure of the genetic material (DNA and RNA), and the main differences between DNA and RNA.
4. Understand regulation of gene expression and the process of DNA replication, mutations, and DNA repair.
5. Understand the basis of PCR, DNA sequencing, pharmacogenetics, and recombinant DNA technology.
6. Understand the principles of clinical enzymology.
7. Understand the biochemistry of porphyrin and bile pigments.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the nature of hormones and their biological roles.
2. Describe the process of protein synthesis.
3. Describe the structure of genetic materials, the process of transcription, and translation.
4. Describe the regulation of gene expression process in prokaryotes and eukaryotes.
5. Describe the process of DNA replication and DNA repair mechanisms, also the PCR, DNA sequencing, pharmacogenetics, and recombinant DNA.
6. Identify the principles of clinical enzymology.
7. Describe the biochemistry of porphyrin and bile pigments.

B.INTELLECTUAL SKILLS

1. Discuss the nature of hormones and their biological roles.
2. Discuss the process of Protein synthesis.
3. Discuss the structure of genetic materials, the process of transcription, and translation.
4. Discuss the regulation of gene expression process in prokaryotes, and eukaryotes.
5. Discuss the process of DNA replication and DNA repair mechanisms and describe the PCR, DNA sequencing, pharmacogenetics, and recombinant DNA.
6. Discuss the principles of clinical enzymology.
7. Discuss the biochemistry of porphyrin and bile pigments.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Identify the hormones.
2. Demonstrate the process of protein synthesis.
3. Demonstrate the regulation of gene expression process.
4. Demonstrate the structure of genetic materials, the process of transcription, and translation.
5. Apply PCR, DNA sequencing, pharmacogenetics, and recombinant DNA procedures.
6. Interpret the principles of clinical enzymology.
7. Apply the biochemistry of porphyrin and bile pigments.

D.GENERAL AND TRANSFERABLE SKILLS

2. Conduct scientific experiments and analyses with accuracy, and precision based on data from tutorials take place in practical classes.
3. Self-guided learning contributes to subject-specific knowledge, and self-motivation.

COURSE CONTENT:

Expression of Genetic information

- DNA replication and repair.
- Transcription and RNA processing.
- Protein synthesis.
- Mutations.

I -Introduction: DNA structure and organization.

II - DNA replication and repair:

- DNA replication in prokaryotes requirements, DNA polymerases, steps of replication (initiation, elongation and termination).
- DNA replication in eukaryotes, requirements, eukaryotes DNA polymerase, steps of replication (initiation, elongation and termination)
- Drugs that affect DNA replication; anti-metabolites, substrate analogues, inhibitors that interact with DNA.
- DNA repair: major DNA repair systems; excision and purinic repair, uracil removal and direct repair.

III- Transcription and RNA processing:

- Types of RNA, promoters (eukaryotic and prokaryotic)
- Transcription in Prokaroyotes: prokaryotic RNA polymerase, steps of transcription (initiation, elongation and termination).
- Transcription in Eukaroyotes: eukaryotic RNA polymerase, steps of transcription (initiation, elongation and termination, DNA elements that regulate initiation (enhancers and silencers).
- Inhibitors of transcription.
- Post transcriptional modification (RNA processing)
- Prokaryotic RNA processing.
- Eukaryotic RNA processing.

IV-The genetic code and protein synthesis:
- The genetic code; features of the genetic code, wobble hypothesis.
- Amino acid activation (amino acyl tRNA formation)
- Protein synthesis: initiation, control points in initiation, elongation and termination, polysomes, inhibitors of protein synthesis, post transcriptional modifications.
- Mutation: Base substitution, insertion and deletion of bases.

REGULATION OF GENE EXPRESSION AND RECOMBINANT DNA

I- biomedical importance:
- Importance of gene expression regulation for development, differentiation and adoption, types of responses of biological systems for a regulatory ligand.

II-Regulation of gene expression in prokaryotes**:**
- Operon as a model for regulation of gene expression. Lactose operon (an example of inducible operon) and tryptophane operon (an example of repressible operon).

III- Regulation of gene expression in Eukaryotes:
- Alteration in gene content and position
- Transcriptional regulation: chromatin remodeling, enhancers and repressors elements, response elements (steroid hormones regulated genes, heat shock response gene), combination of DNA element with associated protein, motifs that regulate DNA binding to associated proteins.
- Eukaryotic genes amplification and rearrangement during development or in response to drugs.
- Control of gene expression in RNA processing (post transcriptional regulation)
- Translational regulation: rate of translation regulation (haem and β-globin translation), protein modification (proinsulin to insulin), protein degradation rate.

IV-Recombinant DNA:
- Definition, tools of recombinant DNA (restriction enzymes, DNA and RNA dependent polymerase, and DNA ligase).
- DNA cloning: Basic strategy of cloning, vectors (plasmid and bacteriphages), DNA libraries (genomic and complementary DNA libraries), cloned DNA fragments sequencing, probes, blotting (southern, Western and Northern).
- Restriction fragment length polymorphism (RFLP) - use of RFLP linkage analysis in identification of a mutant gene causing disease.
-DNA fingerprinting and its use.
- Application of gene cloning to produce recombinant protein, insulin and growth hormones as examples.
- Polymerase Chain Reaction (PCR): steps, advantages and application.

- Genetic disease; gene therapy, gene developing vectors, gene replacements therapy, gene delivering vectors, gene replacement therapy, transgenic mice, introducing a cloned gene into a fertilized ova or into embryonic stem cells.
-The gene – Cancer connection: protoncogenes, oncogenes, tumor suppressor genes (P53 gene).

CLINICAL ENZYMOLOGY

- Clinical application of enzymes: use of enzymes (and isozymes) in the diagnosis and prognosis of diseases, enzymes as reagents, enzymes as labeling reagents in enzyme-linked immunoassay (ELISA), enzymes as therapeutic agent.
- Plasma specific enzymes and their clinical significance.
- Non-plasma specific enzymes and their clinical significance.
- Pathological events leading to enzyme release in plasma (ischaemia, shock, toxic and inflammatory conditions, mechanical and physical destruction of cells, effects of the above factors on the cell metabolism and the cell membrane.
- Transport of intracellular enzyme release to extracellular environment (liver, heart, brain enzymes…etc)
- Examples of clinically important enzymes:, enzymes in cardiovascular disease of myocardial infarction, enzymes in gastroenterology, enzymes in hepatobiliary disease, enzymes in kidney diseases, enzyme tests in malign
ancies, enzyme assay to evaluate degree of toxicity and deficiency of some vitamins (or cofactors).

PORPHYRIN AND BILE PIGMENTS

- Chemistry: Types and occurrence of hemoproteins, structures, physical and chemical properties of hemoglobins, myoglobin.
- Metabolism: Biosynthesis of porphyrin ring system, catabolism of hemoglobin and prophyrins, formation of bile pigments porphyria and prophrinuria.
- Normal hemoglobins, adult, new born and embryonic. The organization of the human hemoglobin genes.
- Abnormal Hb mutations e.g. Hbs, HbM etc. Thalasaemia.

HORMONESAND SIGNAL TRANSDUCTION

I-Biomedical importance, definition, classification by; site of synthesis, chemical structure and water solubility.

II-hydrophilic hormones:

- Cell surface receptors, transmembrane receptors, adrenergic receptors, insulin receptor, atrial natriuretic factor (ANF) receptor, guanylate cyclase, cGMP, nitric oxide and cGMP.

- Cell surface receptor and G-protein (signal transduction)
- Adenylate cyclase pathway; cAMP as a second messenger, cAMP-dependent protein kinases, phosphoprotein phosphatases, phosphodiesterases, hormone that act through adenylate cyclase pathway; insulin and epinephrine as examples.
- Phosphinositide pathway: phospholipase C (PLC) activation, generation of second messengers and cell activation, phorbol esters and protein kinase activation and cell proliferation (tumor promoters), Ca+2 as a second messenger.
- Abnormal G-protein and disease: ADP-ribosylation of Gsγ as in cholera toxin and pertussis toxin, cAMP and phophoinositide pathway.

III-Lipophilic hormones:
- Mechanism of action, intracellular receptors, hormone response elements (HRE), nuclear receptors, examples; steroid and thyroid hormones.

IV- Examples of endocrine hormones (synthesis, structure, function)
- Pituitary hormones; e.g growth hormone.
-Hormones of Ca^{+2}metabolisms; parathyroidhormones and calcitonin, Ca^{+2} haemostasis.
- Hormones of intracellular activation, eg. Thyroid hormones, glucocortcoide and Mineralocorticoids.
- Pancreatic hormones: insulin and glucagen.

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorials.
- Practical.

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm 20%
- Practical 20%
- Final written 60%

LIST OF REFERENCES:

1. Robert K. Murray. Harper's Biochemistry, 31st edition
2. Denise R. Ferrier. Lippincott's illustrated reviews, 6th edition
3. Gaw, et al. Clinical Biochemistry

PHYSIOLOGY III (PS243)

BASIC INFORMATION:

Title	**Physiology III**
Code	PS243
Units	4 units - 6 hours /week
Duration	14 weeks
Prerequisites:	PS141

OBJECTIVES OF THE COURSE:

By the end of the course, the student will learn:

1. Describe the mechanism and function of the central nervous system, sensory, motor function and special senses system and recognize any abnormalities associated with their function.
2. Understand the morphological and physiological function of various endocrine glands, and abnormalities associated with their functions.
3. Understand the physiological function of the male and female reproductive system, and physiological changed during pregnancy, the process of fertilization and implantation, and the mechanism of labour.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the general principles of the nervous system and sensory physiology.
2. Describe the motor function of the nervous system and integrative neurophysiology, and abnormalities associated with their functions.
3. Describe the special senses of the nervous system and abnormalities associated with their functions.
4. Describe the morphological and physiological function of various endocrine glands, and abnormalities associated with their functions.
5. Describe the physiological function of male and female reproductive systems, physiological changes during pregnancy, the process of fertilization, implantation, and the mechanism of labour.

B. INTELLECTUAL SKILLS

1. Discuss the general principles of the nervous system and sensory physiology.
2. Discuss the motor function of the nervous system and integrative neurophysiology, and abnormalities associated with their functions.
3. Discuss the special sense of the nervous system, and abnormalities associated with their functions.
4. Discuss the morphological and physiological function of various endocrine glands, and the abnormalities associated with their functions.
5. Discuss the physiological function of male and female reproductive systems and physiological changes during pregnancy, the process of fertilization and implantation, and the mechanism of labour.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Demonstrate ability to identify the general principles of the nervous system, and sensory physiology.
2. Demonstrate ability to identify the motor function of the nervous system, the integrative neurophysiology, and abnormalities associated with their functions.
3. Demonstrate ability to identify the special sense of the nervous system and abnormalities associated with their functions.
4. Demonstrate ability to identify the morphological, physiological function of various endocrine glands, and the abnormalities associated with their functions.
5. Demonstrate ability to identify the physiological function of male and female reproductive systems and physiological changes during pregnancy, the process of fertilization and implantation, and the mechanism of labour.

D.GENERAL AND TRANSFERABLE SKILLS

1. Manage effectively time and tasks.
2. Formulate appropriate conclusions based on the results.
3. Follow written protocol and written instructions.
4. Work effectively in a group and work safely in a lab setting.
5. Demonstrate higher level of critical thinking skills and problem solving.

COURSE CONTENT:

A- LECTURES / TUTORIALS

I- CENTRAL NERVOUS SYSTEM

1.1- Introduction – Review of gross anatomy and functions of CNS – Formation and composition of CSF – Blood-brain barrier.

1.2- Sensory function of CNS – Modalities of sensation – Receptors, receptor potential, adaptation, stimulus strength response – Physiology of spinal cord – Ascending tracts, dorsal column, tracts, ventrolateral system, thalamus, connections and functions – Cutaneous, deep and visceral pain (referred pain) – Touch and temperature – Proprioreceptor sensation – Hyperalgesia.

1.3- Reflexes – The reflex arc – General properties of reflexes – Synaptic and junctional transmission – Structure and function of synapse – Facilitation and inhibition – Synaptic electrical events – Neural hormones – Neuromuscular transmission – The myoneural junction – Superficial and deep reflexes – Tendon jerks and their clinical significance.

1.4- Motor functions of CNS – Motor cortex and control of voluntary movement – The pyramidal and extra-pyramidal systems – The internal capsule, basal ganglia, functions and disorders (Parkinsonism) – Upper motor neurons and lower motor neuron lesion – Cerebellum, Connections and functions – Cerebellum lesion – Equilibrium, vestibular apparatus, function of semicircular canals – muscle tone, decerebrate rigidity and supra-spinal regulation.

1.5- The hypothalamus – Connections and functions – Neuroendocrine integration – Control of autonomic functions – Limbic system and emotion hunger and thirst.

1.6- Higher functions of the CNS – The reticular activating system – The electrical activity of the brain – Consciousness – Sleep – Electroencephalogram (EEG) – Memory, learning, speech and judgment of behaviors.

1.7- Some common neurological disorders and abnormalities – transaction of spinal cord (paraplegia) – Hemi section of spinal cord (Brown-squard syndrome) – Hemiplegia – Parkinsonism – Tabes dorsalis – Dorsal root and posterior column lesion – Syringomyelia.

ENDOCINOLOGY AND REPRODUCTIVE PHYSIOLOGY

2.1- Introduction – Definition – Types of hormone – Chemistry – Mechanism of action of hormones – Hypothalamic hormones and their control of pituitary hormones – Hypothalamo-hypophyseal portal vessels – Releasing factors and inhibitory hormone – Regulation of hormone secretion.

2.2- The anterior pituitary gland (adenohypophysis) – Morphology and histology – Hormones of the anterior pituitary and their sources – Chemistry and action of growth hormone and prolactin – Control of growth hormone secretion – Chemistry and control of four trophic hormones – Disorders of growth hormone secretion – Gigantism – Acromegaly – Dwarfism – Panhypopituitarism.

2.3- The posterior pituitary gland (neurohypophysis) – Morphology and histology – Hormones secreted – Chemistry and mechanism of action – Control of secretion.

I. 2.4- The thyroid gland – Morphology and histology – Hormones, synthesis, transport and metabolism of the hormones – Functions – Abnormalites of thyroid function – Anti-

Thyroid drugs – Thyroid function tests.

2.5- Parathyroid gland – Hormonal control of calcium (Ca^{++}) and phosphorus metabolism – Distribution of Ca^{++} in ECF – Ca^{++} homeostasis – Functions of ionized Ca^{++} – Hormones of parathyroid gland – Chemistry, source, action and control of parathyroid hormone secretion – Role of other hormones on calcium metabolism – Abnormalities of parathyroid function.

2.6- The adrenal gland – Morphology and histology – Chemistry, biosynthesis and action of hormones secreted by adrenal medulla and cortex – Abnormalities of their functions.

2.7- The endocrine pancreas – Structure and function of islets of langerhans – Pancreatic hormones – chemistry, sources, action and control of hormones – Abnormalities of their functions.

2.8- Reproductive physiology in male – Morphology and histology of tests – Spermatogenesis – Biosynthesis, chemistry and action of testosterone – Puberty – Infertibility.

2.9- Reproductive physiology in female – Ovaries and their changes from birth to puberty – Menstrual cycle and its hormonal regulation – Chemistry, biosynthesis and action of ovarian hormones.

2.10- Pregnancy – Fertilization and implantation – Endocrine and physiological changes – Pregnancy tests – Placental hormones – Parturition – Lactation – Development of mammary glands – Hormonal action and control – Secretion and ejection of milk – Prevention of pregnancy – Contraceptive methods.

SPECIAL SENSES

3.1- Vision: Introduction – Physiological anatomy of eye.

3.2- Optics of vision: The near point of vision – Image forming mechanism – Biconcave and biconvex lenses – errors of refraction – Visual acuity – Perimeter – Binocular vision.

3.3- Pupillary reflexes: Light reflex and its pathway – Accommodation – Convergence reflex – Presbyopia – Argyle – Robertson pupil.

3.4- Photochemistry of vision: The photoreceptor mechanism – Photopic and scotopic vision – Rhodospin and dim light vision – Dark and light adaptation – Vitamin A.

3.5- Neurophysiology of vision: Role of horizontal amacrine and Ganglion cells – Visual pathway – Functions of primary visual cotex – Eye movements and their control – Fusion of visual images papillary aperture – Control of papillary diameter.

3.6- Colour vision: Tricolour mechanism of colour reception – Types of colour blindness – Tests of colour blindness.

3.7- The sense of hearing: The tympanic membrane and ossicular septum – Transmission of sound through the bone.

3.8- The cochlea – Functional anatomy – Transmission of sound waves in cochlea – functions of organ of corti – Determination of sound frequency and loudness.

3.9- General auditory mechanism: The auditory pathway – Cerebral cortex in hearing – Pitch frequency and amplitude of sound – Hearing threshold.

3.10- Abnormalities of hearing: Types of deafness and their tests – Audiometry – Hearing aids.

3.11- The sense of taste and smell: Primary sensations of taste – The taste bud and its function – transmission of taste, signals into CNS.

3.12- The olfactory membrane – Stimulation of olfactory cells – Transmission of smell signals into CNS – Special attributes of taste and smell.

B- PRACTICAL:

Each student takes a practical class of 2 hours/week. The practical classes include the following**:**

I- Special Senses:

1. Determination of the visual acuity.
2. Performance of the hearing tests.

II. Central Nervous System:

1- Sensory examination:

1. Superficial sensations; Pain, Touch, Temperature.
2. Deep Sensations: Pressure, Tension, Vibration, Position, Movement.

2- Motor Examination

a. Examination of muscle power
b. Examination of muscle state
c. Examination of muscle tone
d. Examination of muscle reflexes:
    i. Superficial reflexes: planter reflex; abdominal reflexes
    ii. Deep reflexes: ankle jerk; knee jerk; biceps jerk; supinator jerk
e. Examination of clonus
f. Examination of coordination

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorials.
- Practical.

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm: 20%
- Practical: 15%
- Final written exam: 65%

LIST OF REFERENCES:

- Department: Lecture Notes in Medical Physiology
- Guyton & Hall**.** Textbook of Medical Physiology
- William F. Ganong**.** Review of medical physiology

ANATOMY III (AN233)

BASIC INFORMATION

Title	**Anatomy III**
Code	AN233
Units	3 units – 5 hours/week
Duration	14 weeks
Prerequisites:	AN 131, AN132

OBJECTIVES OF THE COURSE:

By the end of the course the student will be able to:-

1. Describe the anatomy of the pelvic wall and pelvic organs.
2. Describe the blood and nerve supply of the pelvic organs and their lymphatic drainage.
3. Describe the basic anatomy of the lower limb.
4. Understand the blood and nerve supply of the lower limb and their lymphatic drainage.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the anatomy of the pelvic wall and pelvic organs.
2. Describe the blood and nerve supply of the pelvic organs and their lymphatic drainage.
3. Understand the basic anatomy of the lower limb.
4. Understand the blood, nerve supply of the lower limb, and their lymphatic drainage.

B.INTELLECTUAL SKILLS

1. Discuss the anatomy of the pelvic wall and pelvic organs.
2. Discuss the blood and nerve supply of the pelvic organs and their lymphatic drainage.
3. Discuss the basic anatomy of the lower limb.
4. Discuss the blood, nerve supply of lower limb, and their lymphatic drainage.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Determine the anatomy of the pelvic wall and pelvic organs.
2. Determine the blood and nerve supplyof the pelvic organs and their lymphatic drainage.
3. Dtermine the basic anatomy of the lower limb.
4. Determine the blood and nerve supply of the lower limb, and their lymphatic drainage.

D-GENERAL AND TRANSFERABLE SKILLS

1. Possess the ability to use a computer to search for information related to the course.
2. Possess the ability to give presentations.
3. Ability to work as a team and respect the opinions of others.
4. Self- learning ability.

COURSE CONTENT:

I-THE PELVIC WALLS

- The pelvis: orientation of the pelvis, false pelvis, true pelvis,
- Structure of the pelvic walls
- Types of female pelvis
- sex difference
- Pelvic diaphragm: Levator ani and coccygeus muscles
- Pelvic fascia: Parietal and visceral pelvic fascia
- Pelvic peritoneum
- Nerves of the pelvis (somatic & autonomic nerves)
- Arteries of the pelvis
- Veins of the pelvis
- Lymphatics of the pelvis
- Joints of the pelvis

II- THE PELVIC CAVITY

- Contents of the pelvic cavity
- Pelvic viscera in the male
- Male genital organs (prostate gland , seminal vesicle , vas deferens
- Female genital organs (uterus , ovaries)

III-THE PERINEUM

- Anal triangle (ischio-rectal fossa , anal canal)
- Urogenital triangle (urethra , Perineal Membrane,Urogenital diaphragm , vagina)
- Superficial perineal pouch: Boundaries and contents (male and female)
- Deep perineal pouch: Boundaries and contents (male and female).

III. LOWER LIMB

-Front aspects of the thigh:

- Skin
- Superficial fascia
- Deep fascia
- Muscles of anterior compartment
- Femoral Triangle : (Femoral sheath , femoral artery , femoral vein and femoral nerve)
- Adductor canal

- **Medial aspects of the thigh**

- Muscles , obturator nerve , arterial blood supply

-The gluteal region:

- Skin.
- Fasciae (superficial, deep).
- Ligaments: sacrotuberous and sacrospinous.
- Muscles
- Nerves
- Arteries: Trochanteric& cruciate anastomosis.
- Foramina: Geater and lesser sciatic.

-The back of the thigh:

- Muscles
- Skin (nerve supply)
- Muscles
- Sciatic nerve
- Blood supply

-**Popliteal fossa:**

- Arterial anastomosis around the knee joint

-Joints of the lower limb:

- Hip Joint
- Knee joint

-The leg:

- Fascial compartments of the leg
- Contents of the anterior fascial compartment of the leg (muscles, blood supply, nerve supply)
- Contents of the lateral fascial compartment of the leg (muscles, blood supply, nerve supply).

- The back of the leg:

- Contents of the posterior fascial compartment of the leg (muscles, superficial and deep , blood supply, nerve supply)

- Ankle region:

- Relation of the anterior and medial side
- Ankle joint

- The foot:

The sole of the foot

- Muscles & Long tendons:
- Arteries : Lateral and medial plantar
- Nerves: Lateral and medial plantar

The dorsum of the foot:

- Skin
- Muscles
- Arteries and Nerve supply

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorials.
- Atlas.
- Modals.
- Plastinated cadaver.

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm 20%
- Practical 30%
- Final written exam 50%

LIST OF REFERENCES:

1. Course Notes: Lecture Notes By staff members.
2. Clinical anatomy for medical students. Richard S.

MICROBIOLOGY AND IMMUNITY (MB241)

BASIC INFORMATION:

Title	**Microbiology and immunity**
Code	MB241
Units	4 units - 6 hours / week
Duration	14 weeks
Prerequisites:	BC142, PS142, HS141

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Identify the structure, morphology, and growth requirements of different pathogenic microorganisms, and develop an understanding of their mechanism of pathogenicity and virulence factors.
2. Understanding the importance of microbial genetics.
3. Understand the general properties of medically important viruses and fungi.
4. Understand the key principles of immunology, and the mechanisms involved in immune system development and responsiveness and discover tumor theory, and explain the principles of tumor immunity.
5. Understand the principles of immune tolerance, autoimmunity, hypersensitivity reactions, blood incompatibility, and transplantation.
6. Understand the concept of sterilization and discuss the role of antimicrobial agents and vaccines in protection against different diseases.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the basic morphology, growth, and nutritional requirements of different pathogenic bacteria, also the normal bacterial flora localization and function.
2. Describe different molecular processes involved in microbial genetics such as gene replication, expression, and gene mutation, also the mechanism of pathogenicity and virulence factors of pathogenic bacteria.
3. Describe different methods of sterilization and the mode of action of antimicrobial agents.

4. Determine the general properties of medically important viruses and fungi.
5. Define the normal structure and function of human organs that are related to the immune system as primary and secondary lymphoid organs and the key components of innate and adaptive immunity.
6. Describe the main mechanisms of immune tolerance, autoimmunity, and hypersensitivity reactions.
7. Identify several types of vaccines and the mechanism of protection against different diseases
8. Describe tumor-associated antigens, theory, Immunotherapy of tumors, blood incompatibility, and immunity of transplantation.

B.INTELLECTUAL SKILLS

1. Discuss the basic morphology and the growth and nutritional requirements of different pathogenic bacteria, and the normal bacterial flora localization and function.
2. Describe different molecular processes involved in microbial genetics such as gene replication, gene expression, gene mutation, and the mechanism of pathogenicity and virulence factors of pathogenic bacteria.
3. Distinguish between different methods of sterilization and the mode of action and indications of antimicrobial agents.
4. Discuss the general properties of medically important viruses and fungi.
5. Recognize the normal structure and function of human organs thatare related tothe immune system as primary and secondary lymphoid organs and the key components of innate and adaptive immunity.
6. Discuss the main mechanisms of immune tolerance, autoimmunity, and hypersensitivity reactions.
7. Distinguish between several types of vaccines and the mechanism of protection against different diseases.
8. Discuss tumor-associated antigens, theory and Immunotherapy of tumors, blood incompatibility, and immune response to organ transplantation.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Demonstrate the basic structure, morphology , growth and nutritional requirements of different pathogenic bacteria and the normal bacterial flora localization, and function.
2. Determine different molecular processes involved in microbial genetics such as gene replication, expression and gene mutation, and the mechanism of pathogenicity and virulence factors of pathogenic bacteria.

3. Apply different methods of sterilization and antimicrobial agents.
4. Determine the general properties of medically important viruses and fungi.
5. Identify the normal structure and function of human organs that are related to the immune system as primary and secondary lymphoid organs and the key components of innate and adaptive immunity.
6. Identify immune tolerance, autoimmunity, and hypersensitivity reactions.
7. Use different types of vaccines against different diseases
8. Demonstrate tumor-associated antigens, theory and Immunotherapy of tumors, blood incompatibility, and transplantation.

D.GENERAL AND TRANSFERABLE SKILLS

1. Team working in the laboratory.
2. Acquire communication skills (both written and oral).
3. Use of information technology.

COURSE CONTENTS:

1- LECTURES

I. GENERAL MICROBIOLOGY

-Introduction to Microbiology

- Microbiology and Medicine
- History of microbiology

-Basis for Classification laboratory diagnosis of Microorganisms

- Classification of pathogenic bacteria (Diversity of microbes, numerical taxonomy and kingdom of bacteria).
- Laboratory diagnostic Microbiology (Staining of bacteria, culture media, identification of bacteria, serological methods and molecular diagnosis**.**

-Morphology and cell structure of Microorganisms

- Difference between eukaryotic and prokaryotic cells.
- Bacterial cellstructure(essential components and nonessential components).
- Sporulation and germination.

-Growth and nutrition of bacteria

- Growth of bacteria & generation time.
- Growth requirement for bacteria (physical & chemical requirements).
- Environmental conditions required for growth.
- Bacterial growth cycle.

- Metabolism of bacteria**.**

-Principles of bacterial genetics

- Structure of eukaryotic and prokaryotic nucleic acid (structure of DNA and structure of RNA).
- Bacterial genome (chromosome, extrachromosomal elements, bacteriophages)
- Replication of DNA.
- Gene expression (transcription and translation).
- Mutations (non-chromosomal elements of the genes and plasmid).
- Genetic diversity (genetic recombination, genetic exchange and mutation)**.**

-Disease producing agents

- Pathogenicity of bacteria (virulence factors of bacterium, route of entry into the body and the origin and progress of infection.
- Virulence factors of bacterium (adherences, invasiveness, toxogenicity, pathogenicity islands (PIs), enzymes, anti-phagocytic factors, intracellular pathogenicity, antigenic heterogeneity, iron requirement and bacterial biofilms).
- Routes of pathogen entry & transmission.
- Originate and progress of infection (source of the infection, routes of pathogen transmission and patterns of infection)**.**

-Normal flora

- Definition of normal flora.
- Groups of normal flora (resident Flora and transient flora).
- Importance of normal flora.
- Disadvantages of normal flora.
- Relationship between normal flora and host (mutualistic, commensalistic and opportunistic).
- Distribution and occurrence of normal flora in various body systems (skin, conjunctiva, upper respiratory tract (nasopharynx), oral cavity, gastrointestinal tract and rectum and urogenital tract.

-Sterilization and disinfection

- Definitions of terms (sterilization, disinfection, asepsis, antisepsis, antiseptics, sanitizer, sanitization, bacteriostatic, bactericidal, virucidal, fungicidal, microbicidal, sporicidal, tuberculocidal, germicidal and decontamination).
- Mechanisms of action of antimicrobial agents (factors affecting efficacy).
- Sterilization (dry heat, moist heat, radiation and filtration).

- Sterilization control (physical, chemical and biological).
- Advantages and disadvantages of sterilization methods.
- Disinfectants (phenolics, halogens, quaternary ammonium compounds, diguanides, alcohols, aldehydes and chlorinated bisphenols).
- General characteristics of disinfectants.
- Disinfectants /antiseptics properties.
- Classification of disinfectants.
- Application in medicine**.**

-Antimicrobial chemotherapy

- Classification of Antimicrobial agents (effects on cells, range of activity and mechanisms of action).
- Mechanisms of action of antimicrobials (inhibition of cell wall synthesis, Inhibition of cell membranes function, inhibition of protein synthesis, inhibition of nucleic acid synthesis, inhibition of general metabolic pathway).
- Mechanism of antibiotic resistance (enzymatic destruction of drug, prevention of penetration of drug, alteration of drug's target site, rapid ejection of the drug).
- Principles of antimicrobial therapy.

-General Properties of Viruses

- Classification of Viruses.
- Principles of Virus Structure.
- Replication of viruses.
- Mechanism of viral pathogenesis.
- Cultivation & Assay of viruses**.**

-Introduction to Medical Mycology

- General characteristics of fungi.
- Advantages and disadvantages of fungi**.**
- Pathogenicity of fungi.
- Morphology of fungi mold and yeast.
- Dimorphic fungi.
- Growth and Nutritional requirements.
- Reproduction and classification of fungi.

II. IMMUNOLOGY

A. Basic Immunology

-Structure and function of immune system

- Tissues of the immune system**.**

-Cells of the immune system

- The pluripotent stem cells.
- Lymphoid progenitor: B and T cells production, maturation and activation.
- Myeloid progenitor (monocytes, polymorphic cells, RBCs and platelets).
- Antigen presenting cells.
- Phagocytic cells and inflammatory cells**.**

-Molecules of immune system

- Major histocompatibility complex molecules.
- T cell receptor.
- Antigens and antigen processing.
- Antibodies and its role in immune system.
- Monoclonal antibodies**.**

-Complement

- Definition and types of complement pathways.
- Complement in inflammationand disease.
- Complement fixation**.**

-Cytokines, interleukins and chemokines

-Natural and acquired immunity

-Immune response

- Factors affecting immune response.
- Cells involved in the immune response.
- Primary and secondary immune response.
- Humeral response and cell-mediated response.
- Immune response to pathogens.
- Immune system surveillance and immune escaping**.**

B. immune system disorder

-Immunodeficiency

- Primary immunodeficiency.

- Secondary immunodeficiency.

-Autoimmune diseases

- Definition.
- Immunological tolerance.
- Types of autoimmune diseases and pathogenesis.

-Hypersensitivity reactions

-Immunization and Vaccination

-Immunohaematology

- The ABO blood groups and transfusion reactions.
- Rh bloodtype and haemolytic disease of new born**.**

-Immunology of transplantation

- Types, mechanism and causes of rejection.
- MHC, HLA- I and II, tissue typing**.**
- GVA and HVG**.**

-Tumor immunology

- Tumor associated antigens, onco-fetal antigens**.**
- Mechanism of tumor immunology**.**
- Immune escape theory**.**
- Immunotherapy of tumors**.**

2- LABORATORY SESSIONS:

-Instruments and safety rules

- Laboratory safety regulations.
- Laboratory instruments and equipments**.**

-Aseptic technique and smear preparation and simple stain

- Hand Wash and Hand Antiseptic (objectives, materials and procedure).
- Illustration of smear preparation.
- Simple stain (purpose, principle, procedures and uses).

-Sterilization and Disinfection and hand wash (purpose, principle, procedure)
-Differential stain and motility test

- Gram stains (purpose, principle, procedures and uses).

- Motility test (hanging drop, semisolid medium and solid medium).

-Special stain (spore stain, capsule stain and negative stain)
- Purpose, principle, material and procedure of special stains-Culture media (purpose, principle, media state and types of media)

- Simple (basal): nutrients media & broth, peptone water and sugar media.
- Enrichment media: tetrathionate broth and selenite F broth.
- Enriched: cooked meat media, , chocolate agar and blood agar.
- Differential media: blood agar.
- Selective: MacConkey's agar, CLED agar and simmon's citrate agar.
- Special media: loeffler serum media and lowenstein Jensen media.

- Isolation of pure culture and antibiotic sensitivity test

- Disc Diffusion (Kirby- Bauer) Method: principle and purpose.
- Tube Dilution method (break end point or micro and macro-broth method): principle and purpose.

-Immunology:

- Complement fixation test (CFT): principle and purpose.
- Enzyme linked immunosorbent assay (ELISA): principle, types of ELISA (Indirect, sandwich ELISA and competitive ELISA) and purposes.
- Single radial immunodiffusion (SRID): principle and purpose.
- Double radial immunodiffusion (DRID): principle and purpose.

- Polymerase chain reaction (PCR) protocol:

- Principle and PCR components.
- Gelelectrophoresis steps.
- PCR application.

3- TUTORIALS:

- Basis for Classification laboratory diagnosis of Microorganisms.
- Morphology and cell structure of Microorganisms.
- Growth and nutrition of bacteria.

- Principle of microbial genetics.
- Disease producing agents.
- Normal flora**.**
- Sterilization and disinfection.
- Antimicrobial chemotherapy**.**
- General Properties of Viruses.
- Characteristics of Fungi.
- Basic Immunology.
- Immune system disorder**.**

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorials.
- Practical. (Tutor presentation followed by students' small group sessions).

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm 20%
- Practical 20%
- Final written exam 60%

LIST OF REFERENCES:

1. Course Notes: Lecture and Practical Notes. By department staff members.
2. Murray, P. R., Rosenthal, K. S., &Pfaller, M. A. (2013). Medical microbiology. Philadelphia: Elsevier/Saunders.
3. Brooks, G. F., Jawetz, E., Melnick, J. L., &Adelberg, E. A. (2010). Jawetz, Melnick, &Adelberg's medical microbiology. New York: McGraw Hill Medical.

FIFTH SEMESTER

	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Anatomy IV	AN234	3	2	2	1	AN131,AN132
Parasitology	PA240	4	3	2	1	BC142,PS142,HS142,AN233
Pharmacology I	PH241	4	3	2	1	BC142,PS142,HS142,AN132
Pathology I	PT241	4	3	2	1	BC142,PS142,HS142,AN233
Clinical Skills I	CS211	1	0	2	1	Determined by achieved number of units
TOTAL		**16**	**11**	**10**	**5**	

ANATOMY IV (AN234)

BASIC INFORMATION:

Title	**Anatomy IV**
Code	AN234
Units	3 units – 5 hours / week
Duration	14 weeks
Prerequisites:	AN 131, AN132

OBJECTIVES OF THE COURSE:

By the end of the course, the student will able to:-

1. Understand the anatomy of the head region.
2. Understand the anatomy of the neck region.
3. Identify the neuroanatomy terms and organization of the central nervous system.
4. Understand the anatomical structure of the cranial fossa, cranial nerves, the blood supply of the brain, and the anatomy of the spinal cord.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the anatomy of the head region.

2. Describe the anatomy of the neck region.
3. Identify neuroanatomy terms and organization of the central nervous system.
4. Describe the basic anatomical structure of the cranial fossa, cranial nerves, the blood supply of the brain, and the anatomy of the spinal cord.

B.INTELLECTUAL SKILLS

1. Discuss the anatomy of the head regions.
2. Discuss the anatomy of the neck region.
3. Discuss the neuroanatomy terms and organization of the central nervous system.
4. Discuss the basic anatomical structure of thecranial fossa, cranial nerves, the blood supply of the brain and the anatomy of the spinal cord.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Determine the anatomy of the head regions.
2. Determine the anatomy of the neck region.
3. Use the neuroanatomy terms and organization of thecentral nervous system.
4. Determine the basic anatomical structure of cranial fossa, cranial nerves, the blood supply of the brain, and the anatomy of the spinal cord.

D.GENERAL AND TRANSFERABLE SKILLS

1. Possess the ability to use a computer to search for information related to the course.
2. Possess the ability to give presentations.
3. Ability to work as a team and respect the opinions of others.
4. Self- learning ability.

COURSE CONTENTS:

- **HEAD REGION:**
  - Bones: - skull, mandible, Hyoid bone, Cervical vertebrae.
  - Scalp (layersm nerve supply, arterial supply, venous drainage, lymphatic drainage).
  - Cranial cavity: Meninges, including dural folds and venous sinuses.
  - Face: muscles nerve supply, arterial supply, venous drainage, lymphatic drainage**.**
  - Temporal, infratemporal fossa and ptergopalatine fossa.
  - Muscles of mastication.
  - Parotid salivary gland**.**

- Orbit: eye lid, lacrimal apparatus, extra ocular muscles, nerves and vessels of the orbit, ciliary ganglion, orbita fascia.
- Temperomandibular joint**.**

- **NECK REGION**
  - Fascia (superficial, deep).
  - Neck triangles (boundaries- contents),
  - Submandibular region
  - Muscular triangle (infrahyoid muscles, ansa cervicalis).
  - Scalene muscles, Sternocleidomastoid muscle ,
  - Thyroid gland, parathyroid glands
  - Cranial nerves, cervical plexus, cervical sympathetic chain
  - Nasal cavity paranasal air sinuses
  - Oral cavity, Pharynx.
  - Larynx.

- **NEUROANATOMY**
  - Neuroanatomical terms and Oranization of the central nervous system
  - Cerebral hemispheres: External appearance and surfaces.
  - Internal structure of cerebral hemisphers
  - Thalamus and Basal nuclei
  - The white matter of cerebral hemisphere, including corpus callosum and Internal capsule .
  - Brain ventricles: Lateral ventricles, Third ventricle and Fourth ventricle
  - Cerebellum and brain stem.
  - Blood Supply of the Brain
  - Cranial Nerves.
  - Spinal cord: a. External features, internal organization: Grey matter, white matter, tracts.

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorials.
- Atlas.
- Modals.
- Plastinated cadaver.

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm: 20%
- Practical: 30%
- Final written exam: 50%

LIST OF REFERENCES:

1. Course Notes: Lecture Notes By staff members.
2. Clinical anatomy for medical students. Richard S. Snell.

PARASITOLOGY (PA240)

BASIC INFORMATION:

Title	**Parasitology**
Code	PA240
Units	4 units - 6 hours /week
Duration	14 weeks
Prerequisites:	BC142, PS142, HS142, AN233

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able:

1. Understand the epidemiological and ecological aspects of parasites that cause diseases to humans.
2. Identify the theoretical skills required in medical parasitology, including identifying common parasitic diseases, diagnosis, treatment, prevention, and control.
3. Discuss the pathogenesis, clinical symptoms, immunity, and complications of parasitic diseases.
4. Understand the practical skills required to apply the proper diagnostic methods in parasitology.
5. Discuss problems caused by Arthropods of medical importance, and the strategies of vector control.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe general aspects of medically important parasites such as morphology, life cycle, human parasitism, classification, points of practical value, geographical distribution, and immune response to parasitic diseases.
2. Describe the pathogenesis of medically important parasites caused by protozoa and helminthes, and relate the stage of the life cycle to its pathogenesis, clinical signs and symptoms.
3. Define the methods used for diagnosis and treatment of medically important protozoans and helminths and the mode of prevention, treatment, and strategies for controlling these parasites.

4. Outline the classes of medically important arthropods as causative agents of diseases and transmitters of pathogens.
5. Describe the biomedical importance and identify the strategies of vector control.

B. INTELLECTUAL SKILLS

1. Discuss general aspects of medically important parasites such as morphology, life cycle, human parasitism, classification, points of practical value, geographical distribution, and immune response to parasitic diseases.
2. Discuss the pathogenesis of medically important parasites caused by protozoa and helminthes and relate the stage of the life cycle to its pathogenesis, clinical signs, and symptoms.
3. Discuss the methods used for diagnosis and treatment of medically important protozoans and helminths and the mode of prevention, treatment, and control.
4. Classify medically important arthropods as causative agents of diseases and transmitters of pathogens.
5. Explain the biomedical importance, and identify the strategies of vector control.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Demonstrate the practical techniques used to identify parasites in blood, urine, stool, or tissue samples.
2. Identify the morphological features of protozoans under the microscope.
3. Identify the characteristics of different helminth species and identify the morphology of its various stages.
4. Use the microscope to identify the structure of arthropods species.
5. Distinguish microscopically between medically important arthropods species.

D. GENERAL AND TRANSFERABLE SKILLS.

1. Have a computer and some software programs skills.
2. Engage in lifelong self-learning discipline.
3. Manage time effectively.
4. Work constructively and cooperatively within a team.
5. Respect superiors, colleagues.

COURSE CONTENT:

- Introduction to medical parasitology
- Introduction to protozoa & Entamoebidae
- Giardia & Trichomonas

- Introduction to Apicomplexa & Cryptosporidium & Isospora
- Toxoplasma gondi
- Pneumocystis jiroveci
- Malaria & Babesia
- Trypanosoma gambiense&rhodesiense
- Leishmania donovani,L.infantum,L.tropica,L.major,L.aethiopica
- Introduction to Trematodes, & Hepatic flukes (Fasciola hepatica)
- Blood flukes(Schistosoma haematobium &mansoni) & snail intermediate host
- Introduction to cestodes& Taenia saginata
- Hydatidosis/unilocular&multilocular)Coenurus cerebralis
- Hymenolepis nana&diminuta
- Introduction to nematodes & Ascaris & visceral larva migrans
- Enterobius & Trichuris.
- Ancylostoma duodenale
- Strongyloides stercoralis
- Filarial worms (Wuchereria bancrofti&Loa loa)
- Introduction to arthropods
- Mosquitoes, Sand fly & Tsetse & Biting midges & Musca
- Myiasis& Myiasis causing flies,filth flies
- Fleas & Lice & Bugs
- Ticks & Mites
- Venomous arthropods(scorpions&spiders)
- Vector control

TEACHING AND LEARNING METHODS:

- Lectures
- Tutorials
- Practical

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm: 25%
- Practical: 20%
- Final written exam: 55%

LIST OF REFERENCES:

1. Neva &Brown. Basic clinical parasitology. 6th edition
2. Markell Voge John. Medical parasitology.

PHARMACOLOGY I (PH241)

BASIC INFORMATION:

Title	**Pharmacology I**
Code	PH241
Units	4 units – 6 hours /week
Duration	14 weeks
Prerequisites:	BC142, PS142, HS142, AN132

OBJECTIVES OF THE COURSE:

By the end of course, the student will be able to:

1. Understand the pharmacokinetics and pharmacodynamics of the drug.
2. Understand the pharmacological action of drugs acting on the autonomic nervous system.
3. Identify the autacoids- related drugs.
4. Understand diuretic drugs and their uses.
5. Understand the drugs acting on the cardiovascular system (CVS) and their applications in the treatment of different diseases.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the pharmacokinetics and pharmacodynamics processes.
2. Describe the drugs acting on the autonomic nervous system and their uses.
3. Describe the mechanism of action of autacoids and related drugs.
4. Recognize the different classes and the pharmacological mechanism of diuretics and their uses.
5. Describe the mechanisms of cardiovascular system drugs.

B.INTELLECTUAL SKILLS

1. Discuss the pharmacokinetics and pharmacodynamics processes.
2. Discuss the drugs acting on the autonomic nervous system, and their uses.
3. Discuss the mechanism of action of autacoids and related drugs.

4. Discuss the different classes and the pharmacological mechanism of diuretics, and their uses.
5. Discuss the mechanisms of cardiovascular system drugs.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Apply factors influencing drug metabolism.
2. Use the drugs acting on autonomic nervous system to treat disease.
3. Use the autacoids and related drugs to treat disease.
4. Apply aclinical case study on diuretics.
5. Diagnose the most common diseases, treatments, and clinical cases scenario of hypertension and congestive heart failure.

D.GENERAL AND TRANSFERABLE SKILLS

1. Possesses the ability to use a computer to search for information related to the course.
2. Possesses the ability to give presentations.
3. The ability to work effectively with others on a common task.
4. Uses critical thinking and problem-solving skills when addressing information, concepts and theories related to the course.
5. Self- learning ability.

COURSE CONTENT:

A- LECTURES / TUTORIALS

1. **General pharmacology**
   Pharmacokinetics
   Pharmacodynamics
2. **Autonomic nervous system:**
   Cholinergic system drugs
   Adrenergic system drugs
3. **Autacoids:**
   Histamine and antihistamines
   Eicosanoids
   5HT, Kinins, PAF
   Angiotensin and related drugs
4. **Diuretics**
5. **Cardiovascular system**:
   Antihypertensive
   Anti-anginal drugs

Drugs used in CHF
Anti-arrhythmics

B- PRACTICAL:

- Dosage forms of drugs.
- Factors influencing drug metabolism.
- Effect of drugs on rabbit eye.
- Effect of drugs on isolated rabbit jejunum.
- Study of the dose-response relationship.

C-CLINICAL CASES:

- Management of hypertension.
- Management of congestive heart failure.

TEACHING AND LEARNING METHODS:

- Lectures
- Practical
- Tutorials

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm: 20 %
- Practical: 20%
- Final written exam: 60%

LIST OF REFERENCES:

1. B.G, Katzung**.** Basic &clinical Pharmacology**.**
2. Pharmacology Lippincott illustrated reviews.
3. Department Lecture notes.

PATHOLOGYI (PT241)

BASIC INFORMATION:

Title	**Pathology I**
Code	PT241
Units	4 units - 6 hours /week
Duration	14 weeks
Prerequisites:	BC142, PS142, HS142, AN233

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Identify the disease onset and pathogenesis.
2. Understand the cell injury and inflammation and repair.
3. Understand the hemodynamic disorders.
4. Understand the tumors and their clinical features.
5. Promote lifelong competencies necessary for continuous professional development.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the pathogenesis and epidemiology, and consequences of the common diseases.
2. Recognize the major cell and tissue alterations associated with these diseases and how they contribute to organ dysfunction.
3. Describe etiology, the pathogenesis of inflammation, and repair response to tissue injury.
4. Identify various types of hemodynamic disorders, and their sequels.
5. Describe the different neoplastic lesions, etiology, spread, and prognosis.

B.INTELLECTUAL SKILLS

1. Discuss the pathogenesis and epidemiology, and consequences of the common diseases.

2. Analyze the major cell and tissue alterations associated with these diseases and how they contribute to organ dysfunction.
3. Discuss the etiology, pathogenesis of inflammation, and repair response to tissue injury.
4. Analyze the various types of hemodynamic disorders and their sequels.
5. Discuss the different neoplastic lesions, etiology, spread, and prognosis.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Use the pathogenesis and epidemiology, and consequences to know the common diseases.
2. Apply the major cell and tissue alterations associated with these diseases and how they affect the organ dysfunction.
3. Use a microscope to identify the inflammation and repair in response to tissue injury.
4. Apply the various types of hemodynamic disorder and their sequels.
5. Demonstrate the gross sectional and microscopic examination of the neoplastic lesions.

D.GENERAL AND TRANSFERABLE SKILLS

1. Present information clearly in written, electronic and oral forms.
2. Use different resources to gain knowledge.
3. Interpret a pathology report in a professional manner.
4. Accept advice and criticism from colleagues.
5. Self-learning ability.

COURSE CONTENT:

1. INTRODUCTION:

What is pathology? What is a disease, mode of onset, course of a disease.Causes of disease, pathogenesis, lesion, naked eye appearance, microscopic picture, clinical manifestations, signs, symptoms, complications, sequel, prognosis and biopsy. Why and how to learn pathology.

2. CELL INJURY:

Disturbance of Growth: Definition, atrophy, hypertrophy, hyperplasia, hypoplasia, Aplasia, agenesis, atresia, metaplasia and dysplasia.

Definitions, causes of cell injury, mechanisms of cell injury (ischemic and hypoxic injury, free radical mediation of cell injury, chemical injury). Forms and morphology

of cell injury, patterns of acute cell injury, subcellular responses to injury, reversible injury, intracellular accumulations (cloudy swelling, fatty change, and hyalinosis) Necrosis (definition, causes, types, naked eye appearance and microscopic picture and fate), apoptosis: definition, mechanism, apoptosis versus necrosis). Pathological calcification, disturbance of pigment metabolism (melanin, lipochrome, blood pigment and anthracosis).

Amyloidosis: Definition, classification, the nature and aetiology of amyloidosis, morphology, clinical correlation.

3. INFLAMMATION:

Acute inflammation: vascular phenomenon, changes of vascular flow and calibre, increased vascular permeability, leukocyte cellular events (margination and rolling, adhesion and transmigration, chemotaxis and activation, phagocytosis and dysgranulation, leukocytes induced tissue injury, defects in leukocytes function, acute inflammatory response), chemical mediators of inflammation (vasoactive amines, plasma proteases, arachidonic acid metabolites, prostaglandins and leukotrienes, platelet-activating factor, cytokines, nitric oxide and oxygen –derived free radicals, lysosomal constituents), and outcome of acute inflammation.

Chronic inflammation (chronic inflammatory cells, and granulomatous inflammation).

Role of lymphatics and lymph nodes in inflammation. Morphological patterns in acute and chronic inflammation. Systemic effects of inflammation.

Granuloma: Definition and classification, Tuberculosis (causative organism, route of infection, reaction of the body. Primary and reinfection types, spread). Syphilis: congenital, acquired type (different stages). Leprosy, Actinomycosis, Rhinoscleroma, and Bilharziasis (aetiology, pathogenesis, morphology, clinincal course.

4. REPAIR: CELL REGENERATION, FIBROSIS, AND WOUND HEALING:

Control of cell growth and differentiation at sites of injury, cell cycle and the proliferative potential of different cell types, molecular events in cell growth, growth inhibition, growth factors, and extracellular matrix and cell-matrix interactions.

Repair by connective tissue: Angiogenesis, fibrosis, and scar remodelling.

Wound healing: healing by first intention, healing by second intention, and wound strength, repair of liver, bone and nervous tissue. Factors that influence wound healing, Complications of wound healing

5. HEMODYNAMIC DISORDERS, THROMBOSIS, SHOCK AND GANGRENE:

Edema, hyperaemia and congestion. Hemorrhage, hemostasis and thrombosis (normal hemostasis, thrombosis: pathogenesis, fate of the thrombus, disseminated intravascular coagulation.

Embolism: Pulmonary thromboembolism, systemic thromboembolism, fat embolism, air embolism, amniotic fluid embolism and infarction.
Shock: pathogenesis of septic shock, stages of shock.
Gangrene: Definition, causes, classification and types.

6. TUMOUR (NEOPLASIA):
Definitions.Nomenclature.Characteristics of benign and malignant neoplasms, differentiation and anaplasia, rate of growth, local invasion, metastasis.
Epidemiology: cancer incidence geographic and environmental factors, age, heredity, acquired paraneoplastic disorders.
Carcinogenesis: the molecular basis of cancer: oncogenes and cancer suppressor genes, genes that regulate apoptosis, DNA repair genes.
Biology of tumour growth: kinetics of tumour cell growth, tumour angiogenesis, tumour progression and heterogeneity.
Aetiology of cancer: carcinogenic agents: chemical carcinogens, radiation carcinogenesis, viral carcinogenesis (RNA, DNA oncogenic viruses).
Host defence against tumours: tumour immunity: tumour antigens, anti tumour effectors mechanisms, immunosurveillance, and immunotherapy of human tumours.
Clinical features of Neoplasia: effects of tumour on host, cancer cachexia, paraneoplastic syndromes, grading and staging of cancer, laboratory diagnosis of cancer, morphologic and molecular methods, biochemical assays.

TEACHING AND LEARNING METHODS:
- Lectures
- Tutorials
- Practical

ASSESSMENT METHODS:
- Total: 100 marks
- Practical Quiz : 5%
- Mid term: 15%
- Practical: 20%
- Final written exam: 60%

LIST OF REFERENCES:

1. Department lecture notes.
2. Robbin's Pathologic Basis of Disease.
3. Muir's textbook of pathology.

CLINICAL SKILLS I (CS211)

BASIC INFORMATION:

Title	**Clinical skills I**
Code	CS211
Units	1 unit (1 hour lecture - 2 hours lab on alternate weeks)
Duration	14 weeks
Prerequisites:	Determined by achieved number of units

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Perform basic clinical procedures on simulation manikin in a safe environment.
2. Understand the principles involved in each task and its normal and abnormal findings.
3. Understand the importance of each skill in the context of a clinical setting
4. Develop student's professional identity.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. List the different routes of parenteral administration.
2. Describe the methods of blood extraction.
3. Describe the major vital signs and their normal levels.
4. Describe the theoretical concepts of ECG.
5. List the items involved in the process of measuring the patients-Input-output.
6. Describe the steps involved in basic life support**.**

B.INTELLECTUAL SKILLS

1. Compare the different methods used in drug administration.
2. Differentiate between the types of blood extraction.
3. Analyze the vital signs and interpret their finding.
4. Analyze the ECG trace.
5. Calculate the input and output of a patient.

6. Discuss the rationale of basic life support.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Give parenteral drugs to a manikin.
2. Extract blood and inserts cannula on a manikin.
3. Examine and assess the vital signs.
4. Apply ECG leads on a manikin.
5. Insert urinary catheter and nasogastric tube on a manikin.
6. Perform basic life support on a manikin.

D.GENERAL AND TRANSFERABLE SKILLS

1. Understand the code of medical ethics.
2. Know the basis of sterilization and hygiene during practical sessions.
3. Practice self and peer evaluation.
4. Manage time effectively.
5. Lifelong learning.

COURSE CONTENTS:

1. **Paraenteral administration**
   1.1 subcutaneous injection
   1.2 intermuscular injection
   1.3 intravenous injection
2. **Blood extraction**
   2.1 venous blood extraction
   2.2 arterial blood extraction
   2.3 intervenous accesses
3. **Input-output**
   3.1 intravenous fluids
   3.2 blood transfusion
   3.3 nasogastric tube
   3.4 urinary catheter
4. **Vital signs**
   4.1 pulse
   4.2 blood pressure measurement
   4.3 temperature measurement
   4.4 oxygen saturation

5. **ECG**
   5.1 ECG lead application
   5.2 ECG interpretation
6. **Basic life support**

TEACHING AND LEARNING METHODS:

- Lecture
- Practical

ASSESSMENT METHODS:

- Total: 100 marks
- Attendance and practical exam after each lab: 25%
- Final Practical, OSCE : 50%
- Final written exam: 25%

LIST OF REFERENCES:

1. Basic life support , American heart association
2. Macleod's clinical examination, 14th edition, Elsewhere health sciences 2018.

SIXTH SEMESTER

	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
Microbiology II	MB342	4	3	2	1	MB241,BC243,PS243
PharmacologyII	PH342	4	3	2	1	PH241, PS243
Pathology II	PT342	4	3	2	1	PT241, AN234
Information Technology	IT320	2	1	2	1	Determined by achieved number of units
Clinical SkillsII	CS312	1	0	2	1	CS211
TOTAL		**15**	**11**	**10**	**5**	

MICROBIOLOGY & IMMUNITY II (MB342)

BASIC INFORMATION:

Title	**Microbiology II**
Code	MB342
Units	4 units – 6 hours/ week
Duration	14 weeks
Prerequisites:	MB241, BC243, PS243

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Understand the most important microorganism including Bacteria, Viruses, Fungi, and their characteristics in terms of pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment, and prevention.
2. Identify types and risk factors that contribute to the Health care Associated Infection (HAI), and control strategies.
3. Understand the significant role of Oncoviruses in developing cancer, and identify unconventional viruses.
4. Identify the conventional and modern laboratory diagnostic techniques used in medical microbiology.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the most common pathogenic bacteria, with emphasis on the general characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment, and prevention.
2. Describe the etiology, risk factors, and control measurements of Health Care-Associated Infection.
3. Describe the most common viral infections with emphasis on morphology, antigenic structure, replication, pathogenesis, clinical diseases they cause, diagnosis, treatment, prevention, and control, also viruses that cause human cancer (Onco-viruses) and unconventional viruses.
4. Describe the characteristics of fungal infection, clinical picture, diagnosis, and treatment of major fungal diseases.

B.INTELLECTUAL SKILLS

1. Discuss the most common bacteria, with emphasis on the general characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment, and prevention.
2. Discuss the etiology, risk factors and control measurements of health care associated infection.
3. Discuss the most common viral infections with emphasis on the classification, genomic structure, clinical features, replication, pathogenesis, laboratory diagnosis, treatment, vaccines, epidemiology, prevention and control, and Oncoviruses and unconventional viruses.
4. Discuss the characteristics of fungal infection, clinical picture, diagnosis, and treatment of major fungal diseases.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Identify the most common pathogenic bacteria.
2. Apply health care associated infection control.
3. Identify the most common viral infections.
4. Identify the most common pathogenic fungi.

D.GENERAL AND TRANSFERABLE SKILLS

1. Possess the ability to work effectively with others on a common task.
2. Self- learning ability.
3. Acquire communication skills.
4. Mange time effectively.

COURSE CONTENTS:

A-LECTURES:

I. SYSTEMIC BACTERIOLOGY:

Pyogenic cocci: Gram positive (Staphylococci and Streptococci) and Gram negative (Neisseria).

- **Staphylococcus species** (Staph. aureus, Staph epidermidis, Staph. saprophyticus)**:** General characteristics, natural habitat, classification, virulence factors, pathogenesis, clinical manifestation, mode of infection, epidemiology, laboratory diagnosis, treatment and prevention.
- **Streptococcus species** (Strep. pyogenes, Strep. agalactiae, Strep. pneumonia, viridans streptococci, Enterococcus species**:** Classification, virulence factors, clinical diseases, laboratory diagnosis, treatment and prevention.
- **Neisseriaspecies**: General characteristics, virulence factors, route of transmission, clinical manifestation, laboratory diagnosis, treatment.

Spore-Forming Gram-Positive Bacilli: *Bacillus* & *Clostridium species*

- **Bacillus species** (B. anthracis, B.cereus): General characteristics, natural habitat, classification, virulence factors, pathogenesis, clinical manifestation, mode of infection, epidemiology, laboratory diagnosis, treatment and prevention

- **Clostridium species**(Cl. perfringens, Cl. tetani, Cl. botulinum & Cl. difficile): General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, mode of infection, epidemiology, laboratory diagnosis, treatment and prevention

Mycobacteria

- Mycobacterium tuberculosis & Mycobacterium leprae:General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- Other Mycobacterium species

Non-Spore-Forming Gram-Positive Bacilli

- **Corynebacterium diphtheria**: General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- Other Coryneform Bacteria.
- **Listeria monocytogenes**: General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- **Actinomycetes species**(A. israelii):General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- **Nocardia species** (N. asteroids*):* General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention*.*

Enteric Gram-Negative Rods (Enterobacteriaceae)

- Escherichea coli, Salmonella serotypes and Shigella species, Klebsiella species, Citrobacter, Seratia, proteus and enterobacter:
- General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.

Enteric Gram-Negative Rods (non-enterobacteriaceae)

- **Pseudomonasaeruginosa and acinetobacter species**: General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- **Vibrios** (Vibrio cholera, V.parahaemolyticus): General characteristics, Toxonomy, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- **Yersinia species**(Y. pestis, Y. enterocolitis): General characteristics, toxonomy, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- **Campylobacter species and Helicobacter pylori**: General characteristics, classification, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention

Haemophilus, Brucella, Bordetella&legionella. (Fastidious bacteria)

- **Haemophilus species** (H. influenzae, H. parainluenzae): General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- **Bordetellae (**Bordetella pertussis):General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.

- **Brucellae** (Br. Melitensis): General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.

- **Legionella pneumophila**:General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.

Spirochetes & Other Spiral Microorganisms

- **Treponemapallidum**: General characteristics, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- **Borrelia species** (B. Burgdorferi&B. recurrentis): General characteristics, natural habitat, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- **Leptospira species** (L. interrogans, L. biflexa): General characteristics, natural habitat, transmission, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.

Intracellular bacteria

- **Rickettsia species**(Rickettsia rickettsiae, Rickettsia prowazekii, Rickettsia typhi and Coxiella burnetii): General characteristics, natural habitat, transmission, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- **Chlamydiae species** (Chlamydia trachomatis, Chlamydophila pneumonia and Chlamydophila psittaci): General characteristics, natural habitat, transmission, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.

Cell wall deficient bacteria

- Mycoplasma pneumonia: General characteristics, natural habitat, transmission, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention**.**

OTHER TOPICS

- Anaerobic infections (Fusobacterium, Prevotella, and Bacteroides): General characteristics, natural habitat, transmission, virulence factors, pathogenesis, clinical manifestation, epidemiology, laboratory diagnosis, treatment and prevention.
- Nosocomial infection**.**

IV. SYSTEMIC VIROLOGY

The classification, genomic structure, clinical features, replication, pathogenesis, laboratory diagnosis, treatment, vaccines, epidemiology, prevention and control are Included in all families for the following viruses

DNA Enveloped Viruses:

- **Herpesviridae**—herpes simplex viruses (cold sores, genital herpes, encephalitis, etc.),varicella-zoster virus (chicken pox, shingles, etc.), Cytomegaloviruses(congenital disorders), Epstein-Barr virus (mononucleosis, Burkitt's lymphoma)
- **Poxviridae**—variola virus (smallpox), Molluscipoxvirus (molluscum contagiosum)

DNA nonenveloped Viruses:

- **Adenoviridae (**Adenoviruses (pharyngitis, conjunctivitis, cold-like infections, gastroenteritis, pneumonia, acute respiratory tract disease, etc.)
- **Polyomaviridae** [BK virus (cystitis), JC virus (PML)]

Papillomaviridae (Human papilloma viruses) (warts, benign tumors, cervical cancer)

Parvoviridae - B19 (fifth disease, aplastic crisis)**.**

Hepatitis viruses:

- Hepatitis A, B, C, D viruses

Enveloped Segmented Single-stranded RNA Viruses: Orthomyxoviruses (Influenzaviruses (influenza, other respiratory infections

Enveloped Non-segmented Single-stranded RNA Viruses:

- **Paramyxoviridae [**Parainfluenzaviruses (cold-like diseases, croup), mumps virus (mumps), measles virus (measles), respiratory syncytial virus (colds, bronchitis)]
- **Coronaviridae** [Coronoaviruses (common colds, Severe acute respiratory syndrome (SARS), Coronavirus disease 2019 (COVID-19)]

Picornaviridae [Rhinoviruses (common colds), polioviruses (polio), Coxsackie viruses (meningitis, encephalitis, myocarditis, pericarditis, cold-like diseases, conjunctivitis), echoviruses (meningitis, encephalitis, exanthems, myocarditis, pericarditis)

Togaviridae [Rubivirus (Rubella/ German Measles) (acquired rubella and congenital Rubella syndrome)]

Rhabdoviruses (rabies virus, vesicular stomatitis virus)

Reoviridae: Rotaviruses (gastroenteritis)

Caliciviruses Norwalk virus (gastroenteritis)
Astroviruses (gastroenteritis)
Arthropod- borne viruses

- **Togaviridae** [various encephalitis viruses (flulike disease, encephalitis)]
- **Flaviviridae** [flaviviruses (encephalitis, dengue hemorrhagic fever, yellow fever, west Nile fever, Zika fever.)]
- **Bunyaviridae** [various encephalitis viruses, phleboviruses and nairoviruses (hemorrhagic fevers, encephalitis]

Miscellaneous Viruses

- **Filoviridae** [Ebola & Marburg viruses (hemorrhagic fevers)]
- **Hantaviruses** (Hantavirus pulmonary syndrome.):
- **Arenaviruses** (Lassa fever, Lymphocytic choriomeningitis)

Retroviridae [HIV (AIDS), HTLV (adult acute T-cell lymphocytic leukemia)]
Tumour viruses & Slow viruses

III. MEDICAL MYCOLOGY:
Medical important fungi and associated diseases

- **Mycotoxicoses**: mycotoxin and associated diseases.
- **Fungal hypersensitivity**.
- **Disease of fungi:** colonization, diseases, host immunity to fungal diseases, classification of fungal diseases.
- **Superficial mycoses**: general characteristics, causative agents, disease, laboratory diagnosis, and treatment.
- **Cutaneous Mycoses** (Dermatophytes**)**: general features, natural habitat, clinical classification and transmission, diagnosis and treatment
- **Subcutaneous Mycoses** (sporothricoses, chromoblastomycoses, eumyctoma): general characteristics, disease, pathogens, clinical symptoms, laboratory diagnosis, and treatment.
- **Systemic Mycoses** (Histoplasma capsulatum, Blastomyces dermatitidis, Paracoccidiodes brasiliensis, Coccidiodes immitis): general characteristics, disease pathogens, clinical symptoms, diagnoses, and treatment)
- **Opportunistic Mycoses**: general characteristic, predisposing factors, Candidiosis, Cryptococcosis, Aspergillosis and Zygomycoses (clinical diseases, agents, diagnosis, and treatment.

B- LABORATORY:

Identification of staphylococci: catalase test, endo-pigment, coagulase test, hemolytic activity on blood agar, mannitol fermentation, & novobiocin sensitivity test.
Identification of streptococci: hemolytic activity on blood agar, lancefield grouping, bacitracin sensitivity test, optochin sensitivity test & bile- esculin test.

Identification of *Enterobacteriaceae*: oxidase test, growth on MacConkey agar, indole test, citrate test, methyl red test, carbohydrate fermentation test, and API 20E test system.

Identification of Non-lactose fermenter members (Proteus species, Slamonella serotypes, Shigella species): urease test, hydrogen sulfide test, and triple sugar-iron agar test.
Identification of Mycobacterium tuberculosis: Ziehl–Neelsen Method (acid fast staining).

Identification of Vibrio: oxidase test and growth on TCBS agar.

Identification of Pseudomonas:
Oxidase test, pyocyanin pigment, and hemolytic activity on blood agar
Virology laboratory: Immunofluorescence assay (IFA) (direct & Indirect), Electron microscope, western blot application, detection of viral proteins (SDS-PAGE & western blot), cultivation of virus (tissue culture, embryonated egg, laboratory animal), injection of embryonated egg and live animals.

Mycology laboratory: culture of fungi, identification of dermatophytes, colonial characteristics, direct microscopic examination, identification of medically important yeast, aspergillus and zygomycosis.

C-TUTORIALS AND MICROBIOLOGY CASES:

- Staphylococcal infections
- Streptococcal infections
- Infections caused by *Enterobacteriaceae*
- Tuberculosis
- Hospital acquired infections
- Virology
- Mycology

TEACHING AND LEARNING METHODS:

- Lectures.
- Practical (tutor presentation followed by students' small group sessions).
- Tutorials and microbiology cases.

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm: 20%
- Practical: 20%
- Final written exam: 60%

LIST OF REFERENCES:

1. Course Notes: Lecture and Practical Notes. By staff members
2. Murray, P. R., Rosenthal, K. S., &Pfaller, M. A. (2013). Medical microbiology. Philadelphia: Elsevier/Saunders.
3. Brooks, G. F., Jawetz, E., Melnick, J. L., &Adelberg, E. A. (2010). Jawetz, Melnick, &Adelberg's medical microbiology. New York: McGraw Hill Medical.

PHARMACOLOGYII (PH342)

BASIC INFORMATION:

Title	**Pharmacology II**
Code	PH342
Units	4 units – 6 hours / week
Duration	14 weeks
Prerequisites:	PH241, PS243

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Identify drugs used for musculoskeletal, their mechanism of action and their side effect.
2. Identify common drugs used in anesthesia.
3. Understand the drugs used for the central nervous system, their mechanism of action, and side effects.
4. Understand drugs used to treat blood and metabolic disorders.
5. Understand common drugs used for gastrointestinal system disease.
6. Understand common anti-cancer drugs.
7. Understand common drugs used for respiratory disorders.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe drugs used to treat musculoskeletal system.
2. Describe drugs used for anesthesia.
3. Describe drugs used to treat nervous system.
4. Describe drugs used to treat blood and metabolic disorders.
5. Describe drugs used to treat the gastrointestinal tract.
6. Describe drugs used to treat malignant diseases.
7. Describe drugs used to treat respiratory diseases.

B.INTELLECTUAL SKILLS

1. Discuss the drugs used to treat musculoskeletal system.
2. Discuss drugs used for anesthesia.
3. Discuss drugs used to treat nervous system.
4. Discuss drugs used to treat blood and metabolic disorders.
5. Discuss drugs used to treat the gastrointestinal tract.
6. Discuss drugs used to treat malignant diseases.
7. Discuss drugs used to treat respiratory diseases.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Apply the drugs used to treat musculoskeletal system.
2. Apply drugs used on anesthesia.
3. Apply drugs used to treat central nervous system diseases.
4. Apply drugs used to treat blood and metabolic disorders.
5. Apply drugs used to treat gastrointestinal tract.
6. Apply drugs used to treat malignant diseases.
7. Apply drugs used to treat respiratory diseases.

D.GENERAL AND TRANSFERABLE SKILLS

1. Possess the ability to use a computer to search for information related to the course.
2. The ability to work effectively with others on a common task.
3. Uses critical thinking and problem-solving skills when addressing information, concepts and theories related to the course.
4. Self- learning ability.
5. Writes short reports.
6. Manage time effectively.
7. Respect colleagues.

COURSE CONTENT:

A- LECTURES:

1. **CENTRAL NERVOUS SYSTEM:**

   Analgesics

   - NSAI drugs, paracetamol,

   Antirheumatoid arthritis drugs, Antigout drugs.

   - Opioid analgesics

   General anaesthetics,

Preanaesthetic medication
Local anaesthetics
Sedative, hypnotic drugs
Alcohols
Anti-epileptics
Anti-parkinsonism drugs
Antidepressant drugs and mood stabilizers
Antipsychotic drugs
CNS stimulants
Drug dependence

2. **HEMOPOIETIC SYSTEM:**
   Haematinics (iron, vitamin B_{12}, folic acid)
   Coagulats and anticoagulants
   Erythropoietin
   Fibrinolytic agents
Antiplatelets drugs

3. **HYPOLIPIEMIC DRUGS**

4. **GASTROINTESTINAL TRACT DRUGS:**
   Peptic ulcer drugs
   Laxatives
   Antiemitics
   Prokinetics
   Drugs of Inflammatory bowel diseases

5. **ANTICANCER DRUGS**

6. **RESPIRATORY SYSTEM**

B- PRACTICAL:

1. Hot plate and acetic acid methods of inflammation in mice and study of NSAIDs and opioids analgesic activity.
2. PTZ induced convulsions in rats and study of antiepileptic activity of some drugs.
3. Catatonia produced by perphenazine in rats and tremors produced by oxotremorine in mice and study of the antiparkinsonism activity of antimuscarinic drugs.

C- CLINICAL CASES:

1. Management of rheumatoid arthritis
2. Management of anaemia.
3. Management peptic ulcer.
4. Management of bronchial asthma.

TEACHING AND LEARNING METHODS:

- Lecture
- Practical
- Tutorials

ASSESSMENT METHODS:

- Total: 100 marks
- Lab quiz: 5 %
- Midterm: 20 %
- Practical: 15%
- Final written exam: 60%

LIST OF REFERENCES:

1. B.G, Katzung**.** Basic &clinical Pharmacology**.**
2. Pharmacology Lippincott illustrated reviews.
3. Department Lecture notes.

PATHOLOGY II (PT342)

BASIC INFORMATION:

Title	**Pathology II**
Code	PT342
Units	4 units - 6 hours / week
Duration	14 weeks
Prerequisites:	PT241, AN234

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Understand the common pathology that affects the cardiovascular system.
2. Understand the common pathology that affects the respiratory system.
3. Understand the common pathology that affects urinary and male genital systems.
4. Understand common pathology that affects the endocrine system.

INTENDED LEARNING OUTCOMES:

A. KNOWLEDGE AND UNDERSTANDING

1. Describe the common pathological disorders in the cardiovascular system and their resultant effects on the human body.
2. Describe the epidemiology, etiology, and underlying mechanisms within a respiratory system, resulting in various pathology.
3. Recognize different common disease processes in the urinary system and male genital system.
4. Describe specific illnesses regarding the endocrine system.

B. INTELLECTUAL SKILLS

1. Discuss different diseases in the cardiovascular system and its implication for general health.
2. Distinguish between different respiratory illnesses with their manifestations.
3. Discuses different congenital, inflammatory and neoplastic diseases in the urinary system and male genital system.

4. Compare different disease processes in the endocrine system regarding the hypofunction or hyperfunction of the specific organ.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Demonstrate gross sectional and microscope examination of common cardiovascular system pathology.
2. Demonstrate gross sectional and microscope examination of common respiratory system pathology.
3. Demonstrate gross sectional and microscope examination of the common urinary system and male genital system pathology.
4. Demonstrate gross sectional and microscope examination of common endocrine system pathology.

D.GENERAL AND TRANSFERABLE SKILLS

1. Present information clearly in written, electronic & oral forms.
2. Use different resources to gain the knowledge.
3. Interpret a pathology report in a professional manner.
4. Accept advice and criticism from colleagues.

COURSE CONTENT:

1. DISEASE OF THE CARDIO VASCULAR SYSTEM:

A. **Disease of the blood vessels**:

Arterial disorders (arteriosclerosis: atherosclerosis, hypertension and hypertensive vascular disease, and vasculitis: polyarteritis nodosa, Wegener's granulomatosis, microscopic polyangiitis, thromboangitis obliterans, and aneurysms.

Venous disorders: varicose veins, phlebothrombosis and thrombophlebitis, obstruction of superior and inferior vena cava.

Lymphatic disorders: lymphangitis, and lymphedema.

Vascular tumors: hemangiomas, glomangioma, hemangioendothelioma and angiosarcoma, and Kaposi's sarcoma.

Disease of the heart:

Congestive heart failure, ischemic heart disease: angina pectoris, myocardial infarction, chronic ischemic heart disease, and sudden cardiac death.

Hypertensive heart disease, cor pulmonale, valvular heart disease: rheumatic fever and heart disease, calcific aortic stenosis, mitral valve prolapsed, nonbacterial thrombotic endocarditis, infective endocarditis, and prosthetic cardiac valves.
Primary myocardial diseases: myocarditis, cardiomyopathies, dilated cardiomyopathy, hypertrophic cardiomyopathy, and restrictive cardiomyopathy. Congenital heart disease: left to right shunt (atrial septal defects, ventricular septal defects, and patent ductus arteriosus). Right to left shunt (tetralogy of fallot, transposition of the great arteries, congenital obstructive lesions, and coarctation of the aorta.
Pericardial diseases: pericarditis, pericardial effusions
Cardiac tumors: metastatic neoplasms, primary neoplasms.

2. DISEASE OF THE RESPIRATORY SYSTEM:

Lesions of the upper respiratory tract:

Acute and chronic infections of the nose, sinuses, and larynx.Nasopharyngeal carcinoma, laryngeal tumors, non malignant lesions.

Lesions of the lower respiratory tract:

Atelectasis (collapse), Obstructive and restrictive lung diseases.
Obstructive lung diseases: asthma, chronic obstructive pulmonary diseases (emphysema, chronic bronchitis), and bronchiectasis.
Restrictive lung diseases: acute respiratory lung diseases (adult respiratory distress syndrome, diffuse alveolar damage). Chronic respiratory lung diseases (idiopathic pulmonary fibrosis, sarcoidosis, hypersensitivity pneumonitis, diffuse pulmonary hemorrhage syndrome).
Vascular lung diseases: pulmonary thromboembolism, hemorrhage, and infarction. Pulmonary hypertension and vascular sclerosis.
Pulmonary infections: acute bacterial pneumonias, primary atypical pneumonias.
Lung abscess: cytomegalovirus infections, Pneumocystis pneumonia.
Lung tumors: bronchogenic carcinoma, bronchial carcinoid.
Pleural lesions: malignant mesothelioma, pleural effusion and pleuritis, pneumothorax, hemothorax, and Chylothorax.

3. DISEASE OF THE URINARY SYSTEM:

Clinical manifestation of renal diseases. Glomerular diseases: pathogenesis of Glomerular diseases, circulating immune complex nephritis, cell-mediated immune glomerulonephritis, mediators of immune injury, other mechanisms of glomerular injury.

Glomerular syndromes and disorders: the nephrotic syndrome, minimal change disease, membranous glomerulonephritis, focal segmental glomerulosclerosis, membranoproliferative glomerulonephritis, the nephritic syndrome: acute proliferative glomerulonephritis, rapidly progressive glomerulonephritis (Berger's disease), and hereditary nephritis. Chronic glomerulonephritis.

Diseases affecting tubules and interstitium: Tubulointerstitial nephritis, acute pyelonephritis and reflux nephropathy, drug –induced interstitial nephritis, and acute tubular necrosis.

Diseases involving blood vessels: benign nephrosclerosis, malignant hypertension and malignant nephrosclerosis, and thrombotic microangiopathies.

Cystic diseases of the kidney: simple cysts, autosomal dominant (adult) polycystic kidney disease, and autosomal recessive (childhood) polycystic kidney disease.

Urinary outflow obstruction: Renal stones, and hydronephrosis.

Tumors: Renal cell carcinoma, Wilms' tumor, tumors of the urinary bladder and collecting system (renal calyces, pelvis, ureter, and urethra).

4. DISEASE OF THE MALE GENITAL SYSTEM:

Inflammation; testis, epididymis, vas deferens, and seminal vesicle.Tumors of the testis.Sexually transmitted diseases.

Prostate: nodular hyperplasia and tumors. Penis and scrotum diseases.

5.DISEASE OF THE ENDOCRINE GLANDS:

The Pituitary (hyperpituitarism, and pituitary adenomas, hypopituitarism, and posterior pituitary syndromes).

Endocrine pancreas (diabetes mellitus: classification and incidence, pathogenesis and pathogenesis of complication of diabetes).

The Thyroid: hyperthyroidism, hypothyrodisim, Graves' disease, diffuse nontoxic goiter and multinodular goiter, thyroiditis (nonspecific lymphocytic thyroiditis, hashimoto's thyroiditis, and subacute thyroiditis). And neoplasm of the thyroid (adenomas, carcinomas: papillary follicular, medullary, and anaplastic).

The Parathyroid (primary and secondary hyperparathyroidism), and hypoparathyroidism.

The Adrenal cortex (adrenocortical hyperfunction, adrenal insufficiency, and adrenocortical neoplasm).

The Adrenal medulla (pheochromocytoma, neuroblastoma and other neuronal neoplasms).Multiple Endocrine Neoplasia Syndromes.

TEACHING AND LEARNING METHODS:

- Lectures
- Tutorials
- Practical

ASSESSMENT METHODS:

- Total: 100 marks
- Practical Quiz : 5%
- Midterm: 15%
- Practical: 20%
- Final written exam: 60%

LIST OF REFERENCES:

1. Department lecture notes.
2. Robbin's Pathologic Basis of Disease.
3. Muir's textbook of pathology**.**

INFORMATION TECHNOLOGY (IT320)

BASIC INFORMATION:

Title	**Information technology**
Code	IT320
Units	2 units – 3 hours / week
Duration	14 weeks
Prerequisites:	Determined by achieved number of units

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Identify the concepts relevant to health care informatics.
2. Recognize the importance of healthcare information systems.
3. Discuss the computer applications in health care information systems.
4. Recognize the word processing and databases related to clinical information systems.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Explain the definitions and the concept of information technology.
2. Recognize the importance and legal & ethical issues related to the use of information technology in the medical field.
3. Describe the quality of the information system.
4. Determine the resources and quality of Healthcare data and information.
5. Identify healthcare data processing and data collection methods.
6. Identify the potential benefits of electronic health records and electronic prescriptions.

B.INTELLECTUAL SKILLS

1. Discuss the concept of information technology.
2. Discuss the importance and legal and ethical issues related to the use of information technology in the medical field.
3. Give an example of the quality criteria of the information system.
4. Give examples of the resources of Healthcare data and information.

5. Discover the healthcare data processing and data collection methods.
6. Discuss the potential benefits of electronic health records and electronic prescriptions.

B. PRACTICAL AND PROFESSIONAL SKILLS

1. Prepare word, excel and SPSS files.
2. Practice data entry to SPSS.
3. Prepare excel sheet as data base.
4. Prepare a report in a word file.
5. Prepare power point presentation.
6. Conduct calculation of frequency and percentage by use of SPSS.

D.GENERAL AND TRANSFERABLE SKILLS

1. Work effectively within a team.
2. Appreciate the role of information technology in medical field.
3. Ability to write, speak and presenting the data in professional manner.
4. Write reports and worksheets.

COURSE CONTENT:

A- LECTURES

1.1 Definition of Healthcare information Technology.
1.2 History of Healthcare information Technology.
1.3 The development of information technology and its uses in healthcare management.
1.4 Importance of IT in Healthcare sector.
1.5 Current and future trends in the application of information technology to the healthcare industry.
1.6The legal and ethical issues related to the use of information technology in healthcare management.
2.1 Healthcare data and information recourses.
2.2 Health information management (concepts and definitions).
2.3 Types of Data.
2.4 Data presentation.
2.5 Data processing System
    a) Data processing system definitions and concepts.
    b) The importance of data processing system in health sector.
    c) Data processing steps.

d) Data processing methods
e) Data analysis techniques.

2.6 Examples of using data processing in healthcare sector with focus on hospitals.
A) Medical Image Compression.
B) Patients record system in hospitals.
a. Definition and importance.
b. Patient record data and information.
c. Patient record Challenges.

3.0 Electronic Hospital Records (HER)

B- **PRACTICAL:**

1- Microsoft Excel

- A spreadsheet with tools for performing mathematical calculations
- Applying statistical measures
- Charting data
- Making reasoned predictions using regression analysis and goal seeking

2- IBM SPSS:

- Statistics for Beginners for Windows
- Create an SPSS data file from scratch
- Dialogue boxes, variable names
- Value labels
- Data entry using the keyboard
- Analyses data
- Editing data on the grid
- Read an excel data file in to SPSS

3- Microsoft PowerPoint

- An application for making presentations that effectively summarize and communicate statistical data and key results

4- Microsoft Word:

- An application for writing a medical report, and actionable meeting note to inspiring project plans**.**

TEACHING AND LEARNING METHODS:

- Lectures
- IBM- SPSS
- Microsoft- Excel
- Microsoft-PowerPoint
- Microsoft-Worde

ASSESSMENT METHODS:

- Total: 100 marks
- Attendance: 10 %
- Practical : 60 %
- Final written exam: 30%

LIST OF REFERENCES:

1. Ellis, Technology and the Future of Health Care: Preparing for the Next 30Years, Bass, 2000. ISBN-10: 0787957372.
2. Collen, Morris, A History of Medical Informatics in the United States 1950 to 1990, AMIA (American Medical Informatics Association), 1995.
3. O'Carroll, et al. Public health informatics and information systems, Health Informatics Series, Springer 2003.

CLINICAL SKILLS II

BASIC INFORMATION:

Title	**Clinical skills II**
Code	CS312
Units	1 unit (1 hour lecture - 2 hours lab on alternate weeks)
Duration	14 weeks
Prerequisites:	CS211

OBJECTIVES OF THE COURSE:

By the end of the course, student will be able to:

1. Understand the basic skills of taking history.
2. Understand the principles of general examination.
3. Acquire practical experience on how to record clinical history, and perform physical examinations of the respiratory system, and cardiovascular system.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. List the components of taking history.
2. Identify the concepts of general examination.
3. Define various symptoms of the respiratory system.
4. Describe the normal and abnormal clinical findings in the respiratory examination.
5. Define various symptoms of the cardiovascular system.
6. Describe the normal and abnormal clinical findings of the cardiovascular examination.

B-INTELLECTUAL SKILLS

1. Summarize the clinical history.
2. Analyze the abnormal clinical findings in view of reaching a diagnosis.
3. Discuss various symptoms of respiratory system.
4. Distinguish between the normal and abnormal clinical examination of the respiratory system.
5. Discuss various symptoms of cardiovascular system.

6. Distinguish between the normal and abnormal clinical examination of the cardiovascular system.

C-PRACTICAL AND PROFESSIONAL SKILLS

1. Perform history from a standardized role player.
2. Apply general examination on a manikin.
3. Use various symptoms of the respiratory system to present history.
4. Perform clinical examination of the respiratory system on manikin.
5. Use various symptoms of the cardiovascular system to present history.
6. Perform clinical examination of the cardiovascular system on manikin.

D-GENERAL AND TRANSFERABLE SKILLS

1. Understand the code of medical ethics.
2. Respect colleagues.
3. Practices self and peer evaluation.
4. Engage in a lifelong self-learning discipline.
5. Demonstrate good communication skills.
6. Manage time effectively.

COURSE CONTENT:

1. **GENERAL HISTORY TAKING**
   - 1.1 Taking history
   - 1.2 Presenting history
2. **GENERAL EXAMINATION**
   - 2.1 Examinations of face and hands
   - 2.2 Examination of thyroid and cervical lymph noe
   - 2.3 Examination of lower limbs
3. **RESPIRATORY SYSTEM**
   - 3.1 respiratory system history
   - 3.2 respiratory system examination
4. **CARDIOVASCULAR SYSTEM**
   - 4.1 cardiovascular system histories
   - 4.2 cardiovascular system examinations

TEACHING AND LEARNING METHODS:

- Lecture
- Practical
-

ASSESSMENT METHODS:

- Total: 100 marks
- Attendance: 12.5%
- Midterm: 12.5%
- Final written exam: 25%
- Practical, OSCE: 50%

LIST OF REFERENCES:

- Macleod's clinical examination, 14th edition, Elsewhere health sciences 2018.

SEVENTH SEMESTER

Subject title	Code	Unit	Lecture	Practical	Tutorial	Prerequisites
PharmacologyIII	PH343	4	3	2	1	PH241,P243
Pathology III	PT343	4	3	2	1	PT241, AN234
Community Medicine I	CM341	4	3	1	1	PA240, MB342, IT320
Behavioral science	BS320	2	2	0	0	Determined by achieved number of units
Clinical Skills III	CS312	1	0	2	1	CS 312
Total		**15**	**11**	**8**	**4**	

PHARMACOLOGY III (PH343)

BASIC INFORMATION:

Title	**Pharmacology III**
Code	PH343
Units	4 units – 6 hours / week
Duration	14 weeks
Prerequisites:	PH241,PS243

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Understand the common drugs used to treat aninfection.
2. Understand the common drugs used to treat common diseases, that affect endocrine system.
3. Identify the most common immunosuppressant drugs and explain the mechanisms of drug interactions, and describe the most common adverse reactions of the drugs.
4. Undrestand the most common chelating agents used to treat poisoning.
5. Understand the drug interactions and common adverse reactions of medicine, and the role of pharmacogenetics in drug response variations.

6. To enable the student to identify drugs used during pregnancy and lactation.
7. Identify common drugs used for elderly and neonates.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the most common drugs used to treat an infection.
2. Describe the drugs used to treat common clinical diseases of the endocrine system.
3. Describe the most common immunosuppressant drugs.
4. Describe the most common chelating agents used to treat poisoning.
5. Describe drug interactions and common adverse reactions of medicine and explain the role of pharmacogenetics in drug response variations.
6. Describe drugs used during pregnancy and lactation.
7. Describe drugs used for the elderly and neonates.

B.INTELLECTUAL SKILLS

1. Discuss the most common drugs used to trea an infection.
2. Discuss the drugs used to treat the common clinical diseases of theendocrine system.
3. Discuss the most common immunosuppressant drugs.
4. Discuss the most common chelating agents used to treat poisoning.
5. Discuss drug interactions and common adverse reactions of medicine and discuss the role of pharmacogenetics in drug response variations.
6. Discuss the drugs used during pregnancy and lactation.
7. Discuss the drugs used for the elderly and neonates.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Apply the most common drugs used to treat an infection.
2. Apply the drugs used to treat the common clinical diseases of theendocrine system.
3. Apply the most common immunosuppressant drugs.
4. Apply the most common chelating agents used to treat poisoning.
5. Demonstrate drug interactions and common adverse reactions of medicine and pharmacogenetics in drug response variations.
6. Apply the drugs used during pregnancy and lactation.
7. Apply the drugs used for theelderly and neonates.

D.GENERAL AND TRANSFERABLE SKILLS

1. Access online to the information relevant to the pharmacological basis of medical practice.
2. The ability to work effectively with others on a common task.
3. Uses critical thinking and problem solving skills when addressing information, concepts and theories related to the course.
4. Self- learning ability.
5. Writes short reports.
6. Mange time effectively.
7. Respect colleagues.

COURSE CONTENT:

A- LECTURES / TUTORIALS:

1. **CHEMOTHERAPY:**

Introduction
B-lactam antibiotic (pencillins, Cephalosporins & others)
Sulphonamides and trimethoprim
Aminoglycosides
Quinolones and urinary antiseptics
Broad spectrum antibiotics and others
Antitubercular and antileprotic drugs
Antiviral drugs
Antifungal drugs
Antiprotozoal drugs
Antihelmintic drugs

2. **ENDOCRINE SYSTEM:**

Anterior and posterior pituitary
Corticosteroids
Thyroid hormones & antithyroid drugs
Sex hormones
Hormones regulating calcium metabolism
Antidiabetic drugs

3. **MISCELLANEOUS:**

Immuno-suppressants
Chelating agents and treatment of poisoning
Drug interactions
Drug adverse effects
Pharmacogenetics
Prescribing skills
Drugs used in pregnancy, lactation, neonates, the elderly and disease states

B- CLINICAL CASES:

1. Management of a case of bacterial infection by antimicrobials.
2. Management of a case of tuberculosis.
3. Management of a case of HBV or HCV or HIV infection.
4. Management of hyper-or hypothyroidism.
5. Management of a case of diabetes mellitus.

TEACHING AND LEARNING METHODS:

- Lectures
- Tutorials
- Clinical cases

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm: 20 %
- Clinical cases: 20 %
- Final written exam: 60%

LIST OF REFERENCES:

1. B.G, Katzung**.** Basic &clinical Pharmacology**.**
2. Pharmacology Lippincott illustrated reviews.
3. Department Lecture notes.

PATHOLOGY III (PT343)

BASIC INFORMATION:

Title	**Pathology III**
Code	PT343
Units	4 units – 6 hours/ week
Duration	14 weeks
Prerequisites:	PT 241,AN 234

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Identify the pathological basis of systemic diseases including the gastrointestinal, hepatobiliary, female reproductive, hematolymphoid, musculoskeletal, and central nervous systems.
2. Understanding of the etiology, pathogenesis, and resulting biological changes that occur in the disease processes.
3. Describe the gross, microscopic features within tissues as well as the major common pathological processes and patterns of disease.
4. Identify steps to write pathological report.
5. Promote lifelong competencies necessary for continuous professional development.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the common pathological disorders in the gastrointestinal system and their resultant effects on the human body.
2. Outline causes pathogenesis and manifestations of inflammatory or neoplastic hepatic diseases.
3. Describe the different benign and malignant lesions in female reproductive system and breast pathology.
4. Describe the common pathological changes that affect the hematopoietic system.
5. Describe various illnesses and their complications in the bone and musculoskeletal system.
6. Describe different pathological lesions in the central nervous system**.**

B.INTELLECTUAL SKILLS

1. Describe the common pathological disorders of the gastrointestinal system and their resultant effects on the human body.
2. Discuss the pathogenesis and manifestations of inflammatory or neoplastic hepatic diseases.
3. Discuss the different benign and malignant lesions in female genital system and breast pathology.
4. Discuss the common pathological changes that affect the hematopoietic system.
5. Discuss the various illnesses and their complications in bone and musculoskeletal system.
6. Discuss different pathological lesions in the central nervous system.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Apply the common gross sectional and microscopic examination of the gastrointestinal system pathology.
2. Demonstrate the gross sectional and microscopic examination for the pathogenesis of inflammatory or neoplastic hepatic diseases.
3. Differentiate between the gross sectional and microscopic examination of different benign and malignant lesions in female genital system and breast pathology.
4. Demonstrate the common gross sectional and microscopic examination of common Hematopoietic system pathology.
5. Demonstrate the common gross sectional and microscopic examination of common bone and musculoskeletal system pathology.
6. Demonstrate the common gross sectional and microscopic examination of common pathological lesions in the central nervous system.

D.GENERAL AND TRANSFERABLE SKILLS

1. Improve their descriptive capabilities to write pathology reports.
2. Accept advice from colleagues.
3. Present information clearly in written, electronic & oral forms.
4. Self learning.
5. Manage time effectively.
6. Lead and motivate colleagues and others.

COURSE CONTENT:

1. DISEASE OF THE DIGESTIVE SYSTEM:

A. Disease of alimentary tract:

- Disease of the oral cavity (ulcerative and inflammatory lesions, leukoplakia, cancer of the oral cavity and tongue, and salivary gland disease: sialadenitis, salivary gland tumors).
- Disease of the esophagus (anatomic and motor disorders: hiatal hernia, achalasia, lacerations, and varices).
- Esophagitis, Barrett's esophagus, and esophageal carcinoma.
- Disease of the Stomach: acute and chronic gastritis, gastric ulceration (peptic ulcers and acute gastric ulceration), and tumors (gastric polyps, gastric carcinoma).
- Disease of the small and large Intestine: developmental anomalies (hischsprung disease; congenital megacolon), and vascular disorders: ischemic bowel disease, angiodysplasia, and haemorrhoids.
- Diarrheal diseases: diarrhea and dysentery, infectious enterocolitis, and malabsorption syndromes.
- Idiopathic inflammatory bowel disease: crohn's disease, ulcerative colitis.
- Colonic diverticulosis.Bowel obstruction. Tumors of the small and large intestine: non-neoplastic polyps, adenomas, familial polyposis syndromes, colorectal carcinoma, small intestinal neoplasms (adenocarcinoma of the small intestine, and carcinoid tumors).
- Gastrointestinal lymphoma.

Disease of the appendix: acute appendicitis, and tumors of the appendix.

B. Disease of the liver and the biliary tract:

The liver

- General principles (hepatic injury, jaundice and cholestasis, bilirubin and bile acids, pathophysiology of jaundice, cholestasis and hepatic failure: hepatic incephalopathy, hepatorenal syndrome. Cirrhosis: portal hypertension.
- Inflammatory disorders: viral hepatitis (etiologic agents, clinical syndromes), autoimmune hepatitis, and liver abscesses.
- Drug and toxins induced liver diseases: alcoholic liver disease.
- Inborn errors of metabolism and pediatric liver disease: hemochromatosis, Wilson's disease, α1-antitrypsin deficiency, neonatal hepatitis, and Reye' syndrome.

- Intrahepatic biliary tract disease, circulatory disorders: impaired blood flow into the liver, impaired blood flow through the liver, and hepatic venous outflow obstruction.
- Tumor and tumor-like conditions: benign tumors, primary carcinoma of the liver.

The biliary tract

- Disorders of the gall bladder (gallstones, cholecystitis).
- Disorders of the extrahepatic bile ducts: choledocholithiasis, ascending cholangitis, and extrahepatic biliary atresia.
- Tumors; carcinoma of the gallbladder, carcinoma of the extrahepatic bile ducts, including ampulla of Vater).
- The pancreas: exocrine pancreas (acute and chronic pancreatitis, and carcinoma of the pancreas).
- Islet cell tumors: hyperinsulinism (insulinomas, and Zollinger-ellison syndrome (gastrinomas).
- The peritoneum (peritonitis and tumors).

2. A. DISEASE OF THE FEMALE GENITAL SYSTEM

- Uterus: endometritis, adenomyosis, endometriosis, endometrial hyperplasia and dysfunctional uterine bleeding.
- Tumors of the endometium and myometrium: endometrial polyps, leiomyoma leiomyosarcoma and endometrial carcinoma.
- Tumors of the cervix and placenta.
- Fallopian tube: salpingitis, ectopic pregnancy and tumors.
- Ovary: follicle and luteal cysts and polycystic ovaries.
- Vagina inflammation and tumors.

B. Disease ofthe Breast

- Inflammation
- Fibrocystic changes: nonproliferative change (cysts and fibrosis), proliferative change (epithelial hyperplasia, sclerosing adenosis), and relationship of fibrocystic changes to breast carcinoma.
- Tumors of the breast: (fibroadenoma, phyllodes tumor, intraductal papilloma, and carcinoma: non invasive carcinoma, invasive carcinoma, infiltrating lobular carcinoma, and features common to all invasive cancers.
- Male breast: gynecomastia, and carcinoma.

3. DISEASE OF THE HEMATOPOIETIC AND LYMPHOID SYSTEMS

- Red cells disorders (hemorrhage: blood loss anemia, increased rate of red cell destruction, the hemolytic anemias, anemias of the diminished erythropoiesis, and polycythemia).
- White cell disorders (non-neoplastic disorders of the white cells, neoplastic proliferations of the white cells).
- Bleeding disorders (disseminated intravascular coagulation, thrombocytopenia, and coagulation disorders).

Disorders that affect the spleen, lymph nodes and thymus

- Splenomegaly (acute and chronic), hypersplenism (primary & secondary) Lymphadenopathy (inflammation and tumors), Thymus hyperplasia and thymoma.

4. DISEASES OF THE MUSCULOSKELETAL SYSTEM

- Disease of the bone: congenital and hereditary diseases of the bone.
- Osteoporosis and acquired metabolic diseases: osteoporosis, rickets, osteomalacia and bone diseases associated with hyperparathyroidism.
- Osteomyelitis: pyogenic and tuberculous Osteomyelitis.
- Paget's disease.
- **Bone tumors**: bone forming tumors (osteoma, osteoid osteoma and osteoblastoma, and osteosarcoma. Cartilaginous tumors: osteochondroma, chondroma, and chondrosarcoma. Other tumors and tumor-like conditions of bone (giant cell tumor, Ewing's sarcoma, and fibrous dysplasia).
- Disease of the joints (osteoarthritis, Gout, and infectious arthritis).
- Diseases of the skeletal muscle.
- Soft tissue tumors.

5. DISEASE OF THE NERVOUS SYSTEM:

- Congenital malformations Edema, herniation, and hydrocephalus.
- Vascular diseases.Intracranial hemorrhage, Infections of the nervous system.
- Neoplasms of the central nervous system.Degenerative diseases.
- Peripheral nerves diseases

TEACHING AND LEARNING METHODS:

- Lectures
- Tutorials

- Practical

ASSESSMENT METHODS:

- Total: 100 marks
- Practical Quiz : 5%
- Mid term: 15%
- Practical: 20%
- Final written exam: 60%

LIST OF REFERENCE:

1. Department lecture notes.
2. Robbin's Pathologic Basis of Disease.
3. Muir's textbook of pathology.

FAMILY AND COMMUNITY MEDICINE I (CM341)

BASIC INFORMATION:

Title	**Family and community medicine I**
Code	CM341
Units	4 units – 5 hours/ week
Duration	14
Prerequisites:	PA240, MB342, IT320

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Recognize the development of community medicine and appreciate the significance of community medicine in promotive, preventive, curative, and rehabilitative health interventions.
2. Explain the basic principles of epidemiology, including health and disease determinants, natural history, levels of prevention, dynamics of disease transmission, epidemiological measurements, epidemiological studies, screening, causation, and surveillance.
3. Acquire knowledge and skills of basic principles of biostatistics and health information systems and how to apply them in the medical field for problem-solving and decision making.
4. Discuss the concepts, and process of research, and acquire skills to carry out the scientific research taking into account the ethical considerations.
5. Discuss the concepts and elements of health care management and health care system in Libya, including health care quality and patient safety.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Identify the concepts of community medicine, epidemiology, health, and disease.
2. Distinguish different determinants of health and disease.
3. Define the different epidemiologic approaches to measure the occurrence of disease in communities and compare different epidemiological study designs, differentiate between association and causation.

4. Recognize types of epidemics and the main steps of epidemic investigations and know the types, uses of screening tests, and surveillance.
5. Determine the sources of health information and appropriate data collection and bio-statistical methods, and describe the demographic pattern of the country.
6. Identify the research process, research ethics, and research proposal principles and recognize IMRaD format in writing scientific research.
7. Describe the health care delivery system and the principles of health care management; define elements of health service quality and patient safety.

B.INTELLECTUAL SKILLS

1. Categorize the natural history of the disease, prevention levels, and mode of intervention.
2. Discuss disease dynamics, control, elimination and eradication, monitoring, and surveillance.
3. Discuss different epidemiological studies and formulate a research proposal.
4. Give examples for different measures of disease occurrence in communities, and interpret health indicators results.
5. Analyze the data of a screening test for validation.
6. Analyze medical data by using appropriate bio-statistical methods, and interpret vital statistics.
7. Discuss the principles of health care management, quality improvement, and patient safety.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Compute the disease risk associated with exposure and interpret the results.
2. Suggest steps to investigate an outbreak with a demonstration of a spot map.
3. Conduct calculations for various health indicators, vital and hospital statistics, and demographic indices with interpretations.
4. Discover the validity of a new screening test compared with a gold standard.
5. Practice data analysis by using SPSS software to describe data and test hypothesis.
6. Prepare a research proposal regarding a common health problem in Libya.

D.GENERAL AND TRANSFERABLE SKILLS

1. Develop skills as a self-directed learner; recognize continuing educational needs, select and use appropriate learning resources.

2. Demonstrate effective oral and written communication skills in the
3. professional context.
4. Adhere to ethical standards when dealing with data and health information and during the conduction of scientific research.
5. Demonstrate the ability to use the computer for effective presentation and data analysis.
6. Manage time effectively.
7. Work effectively in teams and demonstrate team-working capabilities.

COURSE CONTENT:

1. **Introduction to Community Medicine:**
   - Concepts and evolution of Public Health, Preventive Medicine, Social Medicine & Community Medicine.
   - Significance of community medicine in promotive, curative, preventive and rehabilitative health interventions.

2. **General concepts of Health and Disease:**
   - Definition of health, Dimension and Determinant of health, Health spectrum ,
   - Concept of disease, Disease causation. Disease spectrum, Natural history of disease, epidemiological triad.
   - Disease prevention: Levels of prevention and modes of interventions.

3. **Epidemiology - General considerations:**
   - Definition, aims, approach and uses of epidemiology.
   - Sources of epidemiological data. Measurements of disease frequency, health related states and events. Measurements of mortality and certification of death.
   - Health indicators: definition, characterstics, types
   - Descriptive, analytical and experimental epidemiology. Epidemiological studies: types, purposes, methods, advantages & disadvantages.
   - Association and causation: concepts, types, causal relationship, Bradford Hill Criteria for judging causality.
   - Dynamics of disease transmission: Modes of disease transmission. Concepts and strategies for disease prevention, control, elimination and eradication.
   - Investigation of epidemic, outbreak control and disease surveillance.
   - Disease screening: Concepts and application in community health. Definition and significances of sensitivity, specificity and predictive value.

4. Health information & medical statistics:

- Health information system: component, uses, sources.
- Basic concepts, Uses of statistics, Types of data. Methods of data compilation, and presentation.
- Measures of central tendency and measures of dispersion.
- Inferential statistics
- Sampling
- Probability
- Demography and population dynamics:
  - Definition, Importance, Demographic cycle, Demographic trends in world and Libya.
  - Sources of demography.
  - Characteristics of Libyan population
  - Population growth pattern & indices
  - Population pyramid.
  - Vital statistics, , hospital statsiticcs
- SPSS programme.

5. Health care management:

- Definition of of health care management, domains of administration, popular leadership style, leading and managing, Six management function
- Planning: defntion, steps, cycle, and types. Strategic planning, Tactical planning. Organizational culture.
- Goal, objectives, SMART objective, target, SWOT analysis
- Project planning, work breakdown, GANTT chart.
- Crisis management, management by objectives, results based manangement, results chain, and business process management.

6. Health care delivery system:

- Defintions and concepts, structure, elements, functions.
- Levels of health care with special reference to primary health care. Definition, principles and components of primary health care. Types of health care services, health financing structure, stewardship concepts and health system reform.
- Health care system in Libya: evolution and history, Existing challenges, shortcomings and weaknesses. Changing priority, health services provision, Governce and management, Libyan health care delivery system, Health care financing, Health workforce, Medical supplies and technologies, Health information management, Reform activities.

7. **Quality and patient safety**:
   - Definition, importance, goals of quality improvement, principles, elements.
   - Quality improvement, evaluation of health services: process, indicators and outcomes.
   - Patient safety: concepts, indicators, examples, assessment, domains and risk amanagement.

8. **Research methodology:**
   - Concepts of research, types, processes
   - Data collection methods and tools
   - Writing a study protocol
   - Writing medical paper (IMRAD)
   - Medical and Research ethics: definitions, concepts, importance, principles, general rules, informed consent, and research ethic issues: misconduct (fabrication, falsification and plagiarism), authorship.

TEACHING AND LEARNING METHODS:

- Illustrated lectures
- Group discussion
- Practical: computer Lab (SPSS program)
- Case study, exercise and problem solving
- Materials includes: student's log book including exercises, skills learning guides and check lists.

ASSESSMENT METHODS:

- Total: 100 marks
- Research proposal assignment: 10 %
- Midterm exam 20 %
- Final written exam: 50%
- Modified OSPE exam: 20%

LIST OF REFERENCES:

1. Department lecture notes
2. Park K. Park text book of preventive and social medicine. 22nd edition. Banarsidas bhanot-jabalpur. 2013.

3. Abounaja S. Lecture notes on biostatistics for medical and public health students. Second edition. Dar Kotob Alwatenia, Benegazi, Libya. 2007.
4. Dawsooni-Saunders B. Basic and clinical biostatistics. 2nd edition.
5. Abusnena OI, et al. Tobactus: concise text book of community and social medicine. 2014
6. Abusnena OI. Tips on Research Methodology for Postgraduate Students. Dar Ibn Kather, Tripoi, Libya. 2010
7. Abusnena OI. Epidemiology, Lecture Notes For Medical Students. Dar Ibn Kather, Tripoi, Libya. 2010

BEHAVIORAL SCIENCES (BS320)

BASIC INFORMATION:

Title	**Behavioral sciences**
Code	BS320
Units	2 units - 2 hours /week
Duration	14
Prerequisites:	Determined by achieved number of units

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Understand the principles of social and behavioral science.
2. Recognize the role of complex mind-body interactions in health and disease.
3. Recognize the basics of psychophysiology, that is, how psychological, behavioral, and social factors alter physiology to make diseases.
4. Classify the Psychosocial stressors and discuss their impact on health.
5. Discuss the influence of personal values and attitudes inpatient care.
6. Recognize the importance of motivation, learning, thinking, and language in inpatient care and compliance.
7. Discuss the role of intelligence, personality, and the ability to participate in shared decision-making.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Define the concepts, definitions, and principles of social and behavioral science.
2. Explain how mind-body interactions work in health and disease.
3. Identify how psychological, behavioral, and social factors alter physiology to make diseases
4. Describe the Psychosocial stressors and explain their impact on health.
5. Define the influence of personal values and attitudes in patient care.
6. Explain the importance of motivation, learning, thinking, and language in patient care, and compliance.
7. Determine the role of intelligence and personality in the ability to participate in shared decision making**.**

B.INTELLECTUAL SKILLS

1. Discuss the concepts and principles of social and behavior science.
2. Relate the mind-body interactions to health and disease.
3. Explain the basics of psychophysiology, that is, how psychological, behavioral, and social factors alter physiology to make diseases.
4. Give examples of stress management techniques.
5. Relate personal values and attitudes to patient care.
6. Discuss the importance of motivation, learning, thinking, and language in patient care, and compliance.
7. Analyze the role of intelligence and personality in ability to participate in shared decision-making.

C. PRACTICAL AND PROFESSIONAL SKILLS

1. Apply the major theories of health behavior science in medical field
2. Diagnose abnormal behavior.
3. Apply coping and relaxation skills.
4. Suggest solutions for negative attitudes and prejudice related to healthcare.
5. Suggest the learning and motivation methods used in healthcare.
6. Practice the calculation of the intelligence quotient and interpret the result.

D.GENERAL AND TRANSFERABLE SKILLS

1. Ability to recognize different types of personality disorders.
2. Ability to work within a team.
3. Exhibit respect for socially diverse groups.
4. Ability to think critically to solve problems.

COURSE CONTENT:

1. **Theories and Definitions**
   Define psychology, social, anthropology, and behavioral sciences and their branches, Schools of psychology and their different perspectives.
2. **Foundation of human behavior**
   Explain the different aspects of human biology that directly relevant to understanding human behavior: the nervous system, endocrine glands, and genetic mechanism.

3. **Human Development**
   Illuminate the key terms related to human development, the basic process of development, areas of development, and different stages of human development and the characteristic features of each stage.
4. **Theories of human development**
   Describe the main theorists of human development, the approaches used in the most important theories of development: Piaget, Erikson & Kohlberg theories, and briefly evaluate these three theories.
5. **Nature and Nurture Interplay**
   Clarify the genetic influence on behavior, the role of the environment, physical and social experiences, in shaping our behavior, the different ways of interplay of nature and nurture, define sex, gender, and human diversity and distinguish genetic identity and genetic roles, genetic similarities and gender differences, and the origin of gender differences, and understand the genetics and psychological theories.
6. **Sensation, perception, and attention**
   Explain the concept of sensation and perception and their importance, description the domain of psychophysics, sensory adaptation, description the Gestalt principles of perceptual organization, and describe the concept of attention.
7. **States of consciousness**
   Define the concept of consciousness, sleep and dreams, and altered states of consciousness.
8. **Learning**
   Define learning and its different types, theories of learning and behavioral modifications, and behavioral therapy.
9. **Thinking, problem solving, and language**
   Describe cognition and thinking and their concepts, problem solving and its process, and language and its development.
10. **Memory**
    Define memory and its different types, its process, and its importance and clinical assessment.
11. **Motivation**
    Define motivation; distinguish between the different types of motives, and classification of motives.
12. **Intelligence**
    Describe intelligence, theory of multiple intelligence, factors affecting intelligence, measuring intelligence and intelligence tests, and artificial intelligence.

13. **Emotion, and Health and stress**

    Describe emotion and its arts and components, theories of emotion, emotion and brain, expression of emotion and cultural rules and gender differences, emotion and cognition, and coping and control of emotion.

14. **Personality**

    Define personality, explain the factors that determine an individual's personality, discuss the different theories, measure personality, and describe the major defense mechanism.

15. **Abnormal behavior**

    Define abnormal behavior and its criteria, classify psychological disorder and its system development, the characters of mentally healthy person, types of psychological disorder, and the myths of mental illness.

16. **Social psychology**

    Describe attitudes and its components, attitude formation, attitude change, define prejudice and theories of prejudice, and define aggression and its causes, and conformity and obedience.

TEACHING AND LEARNING METHODS:

- Lectures

ASSESSMENT METHODS:

- Total: 100 marks
- Midterm: 30%
- Final written exam: 70%

LIST OF REFERENCES:

1. Benjamin Lahey. Psychology: An Introduction 11th (eleventh) edition, MCGRAW.HILL international edition, 2011.ISBN-13: 978-0078035166

CLINICAL SKILLS III (CS313)

BASIC INFORMATION:

Title	**Clinical skills III**
Code	CS313
Units	1 unit (1 hour lecture - 2 hours lab on alternate weeks)
Duration	14 weeks
Prerequisites:	CS312

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Describe various symptoms of urology, gastrointestinal and nervous system.
2. Identify the normal and abnormal findings related to urology examination.
3. Identify the normal and abnormal findings related to the gastrointestinal examination.
4. Identify the normal and abnormal findings related to nervous system examination.
5. Describe a lump and ulcer.
6. List the steps involved in wound dressing.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe various symptoms of urology, gastrointestinal and nervous system.
2. Identify the normal and abnormal findings related to urology examination.
3. Identify the normal and abnormal findings related to gastrointestinal examination.
4. Identify the normal and abnormal findings related to nervous system examination.
5. Describe a lump and ulcer.
6. List the steps involved in wound dressing.

B.INTELLECTUAL SKILLS

1. Summarize clinical history of urology, gastrointestinal and nervous system.
2. Distinguish between the normal and abnormal clinical examination of the urology system.
3. Distinguish between the normal and abnormal clinical examination of the gastrointestinal system.
4. Distinguish between the normal and abnormal clinical examinations of the nervous system.
5. Interpret examination of lumps and ulcers.
6. Discuss the process of wound management.

C.PRACTICAL AND PROFESSIONAL SKILLS

1. Take urology, gastrointestinal and nervous system history from a standardized role player.
2. Perform abdominal and rectal examination on a manikin.
3. Perform renal and scrotal examination on a manikin.
4. Perform cranial nerves, motor, sensory, and coordination examinations on peers.
5. Examine the breast and axillary lymph nodes on a manikin as an example of lumps.
6. Examine a diabetic foot ulcer on a manikin as an example of an ulcer.

D.GENERAL AND TRANSFERABLE SKILLS

1. Understand the code of medical ethics.
2. Demonstrate good communication skills.
3. Practices self and peer evaluation.
4. Engage in a lifelong self- learning discipline.
5. Manage time effectively.
6. Respect collogues.

COURSE CONTENT:

1. **THE UROLOGY SYSTEM**
   - 1.1 Urology history taking
   - 1.2 Examination of the kidneys
   - 1.3 Examination of the scrotum

2. **THE GASTROINTESTINAL EXAMINATION**
   2.1. GIT history
   2.2 Abdominal examination
3. **THE CENTRAL NERVOUS SYSTEM**
   3.1 Examination of cranial nerves
   3.2 Motor examination
   3.3 Sensory examination
   3.4 Proprioception
4. **INTRODUCTION TO GENERAL SURGERY**
   4.1 Examination of lumps
   4.2 Examination of breast and the axilla
   4.3 Examination of ulcers
   4.4 Examination of diabetic foot
   4.5 Wound dressing

TEACHING AND LEARNING METHODS:

- Lectures
- Totorials
- Practical

ASSESSMENT METHODS:

- Total: 100 marks
- Attendance: 12.5%
- Midterm: 12.5%
- Final written exam: 25%
- Practical, OSCE: 50%

LIST OF REFERENCES:

1. Macleod's clinical examination14th edition
2. Elsewhere health sciences 2018

STAGE TWO
THE CLINICAL STAGE

FIRST CLINICAL SEMESTER

	Code	Units	Lectures	Bedside teaching	Lab	Tutorials	Weeks	Prerequisites
Ophthalmology	OP440	4	2	5	1	2	12	All basicnon clinicalcourses
Forensic	FT440	4	6	1	2	2		
Community	CM442	4	6	2	1	1		
Total		**12**	**15**	**7**	**3**	**6**	**12**	

OPHTHALMOLOGY (OP440)

BASIC INFORMATION:

Title	**Ophthalmology**
Code	OP440
Units	4 units - 10 hours/week
Duration	12 weeks
Prerequisites:	All basic non-clinical courses

OBJECTIVES OF THE COURSE:

By the end of the course, the student well be able to:-

1. Identify the eye anatomy and physiology to help in the diagnosis of common ophthalmic problems prevalent in Libya.
2. Follow a systemic clinical approach by taking a clinical history, to get presenting symptoms and physical examination to detect signs of the common eye disease.
3. Discuss various causes of sudden and gradual painful and painless visual loss in patients of different ages, its clinical entities, investigation and medical, and/or surgical treatment, and when such patients need to be referred to consultants.
4. Understand all aspects of ocular trauma including first aid and immediate therapy in such cases.
5. Use of ophthalmoscope, to optically scan the media and learn the silent features of the normal eye fundus, and are able to recognize common gross lesions of the posterior segment of the eye.
6. Demonstrate advanced investigations; like ultrasonography, dacryocystography, fluorescein angiography, and theuse of laser therapy in ophthalmology.

INTENDED LEARNING OUTCOMES

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the normal structure and function of the eye.
2. Describe thesystemic approach to history and examination on ophthalmology.
3. Describe the etiology, epidemiology, symptoms and signs, and management of theanterior chamber of the eye.
4. Describe the etiology, epidemiology, symptoms and signs, and management, of theposterior chamber of the eye.
5. Describe the etiology, epidemiology, clinical presentations, examination, assessment and management of common eye emergencies including eye trauma.
6. Describe the common neuro -ophthalmology, ocular tumor and common systemic diseases that affect the eye.

B.INTELLECTUAL SKILLS

1. Discuss the normal structure and function of the eye.
2. Discuss thesystemic approach to history and examination on ophthalmology.
3. Discuss the etiology, epidemiology, symptoms and signs, management, ofthe anterior eye segment.
4. Discuss the etiology, epidemiology, symptoms and signs, management, of the posterior eye segment.
5. Discuss the etiology, epidemiology, clinical presentations, examination, assessment and management of common eye emergencies including eye trauma.
6. Discuss the common neuro -ophthalmology, ocular tumor and common systemic diseasesaffect the eye.

C.PRACTICAL AND CLINICAL SKILLS

1. Use basic skill to detect the normal eye structure and it is function.
2. Use history and examination to diagnose eye problem.
3. Practice the etiology, epidemiology, symptoms and signs , to manage anterior eye segment disease.
4. Practice the etiology, epidemiology, symptoms, and sign, and to manage posterior eye segment disease.
5. Practice the etiology, epidemiology, clinical presentations, examination, and assessment, to manage common eye emergencies including eye trauma.
6. Practice the common neuro -ophthalmology, ocular tumor, and common systemic diseases that present to eye clinic.

D.GENERAL AND TRANSFERABLE SKILLS

1. Possess the ability to use a computer to search for information related to the course.
2. Possess the ability to give presentations.
3. Ability to work as a team and respect the opinions of others.
4. Uses critical thinking and problem solving skills when addressing information, concepts and theories related to the course.
5. Self- learning ability.
6. Manage time effectively.

COURSE CONTENT:

A-LECTURES / TUTORIALS

1. INTRODUCTION TO OPHTHALMOLOGY COURSE AND EYE SYMPTOMS

Visual loss, ocular pain and discomfort , red eye swelling, globe displacement, diplopia and vertigo decrease or increase lacrimation.

2. EXAMINATION OF EYE

Careful pertinent history, physical examination by inspection position of eyes ocular movement, anterior segment, pupil confrontation:-visual field assessment. Slit lamp examination, direct and indirect ophthalmology, lacrimal sac regurgitation test.

3. VISUAL ACUITY AND COLOUR VISION

Definition, development examination, Snellen chart principle, and use near vision chart and its use, abnormal visual acuity, types of disturbances of vision.

4.OCULAR PHARMACOLOGY AND TOXICITY

Route of administration, Anesthetics antibiotics miotic, mydriasis, cycloplegia, Diagnostic dyes fluorescein, rose Bengal, Antiviral and anti fungal drugs, Drugs used in treatment of glaucoma, Anti chlamydial agents, Tears substitutes, Toxicity of antibiotics, atropine, steroids, acetazolamide. Ocular examinations of systemic use of chloroquine ethambutol. Antibiotics, quinine, and corticosteroid.

5. OPTICS AND REFRACTION OF EYE

Optics of spherical surfaces, refractive power, and mechanism of normal eye emmetropia, ametropia, hypermetropia, myopia, astigmatism, presbyopia, aphasia anisometropia contact lens, and intraocular lens implants.

7. DISEASES OF EYE LOSS

Applied anatomy and physiology, Development deformities epicanthus congenital photos. Infections and inflammations of lids Stye, Chalazion, Blepharitis. Allergic dermatitis. Ptosis pseudoptosis. Tumors of the lids.

7. LACRIMAL APPARATUS

Applied anatomy and physiology, Dacryoadenitis, canaliculitis, dacryocystitis. Epiphora and lacrimation. Tears, source, function, and composition, Ocular tear film, Dry eye syndrome. Hyper secretion.

8. DISEASES OF CONJUNCTIVA

Applied anatomy and physiology, Inflammation of conjunctiva bacterial chlamydia viral rickettsia fungal parasitic allergic folliculosis and chemical. Special reference to epidemic viral conjunctivitis. Trachoma viral catarrh, phlyctenular conjunctivitis ophthalmic neonatorum. Conjunctiva xerosis. Degeneration pinguecula and pterygium.

9. CORNEAL DISEASES

Applied anatomy and physiology. Corneal transparency corneal edema. Corneal ulcers bacterial viral and fungal. Perforation and it's complication. Hypopyon ulcer, dendritic ulcer, disciform keratitis, exposure keratitis, neurotropic ulcer interstitial keratitis. Corneal opacity corneal secularization. Band shaped keratopathy. Arcus senilis corneal degeneration and dystrophies. Keratoconus.

10.DISEASES OF SCLERA

Applied anatomy and physiology. Blue sclera ectasia staphylomas, Sclerotic episcleritis scleromalasia,Sclera injuries rupture.

11.DISEASES OF UVEAL TRACT

Applied anatomy and physiology,Uveitis acute and chronic, Granulomatous and non granulomatous, Complications of uveitis, Specific types associated with joint diseases, Lens induced uveitis, Tuberculosis, Lepromatous, Behchet disease, Toxoplasmosis, Toxocariasis, Red eye differential diagnosis. Sympathetic ophthalmia, panophthalmitis. Uveal tumors malignant melanoma.

12. DISORDERS OF LENS

Structure and function. Congenital anomalies lens dislocation. Cataract congenital cataract associated with systemic disease. After cataract, Cataract surgery aphakia and its correction.

13.GLAUCOMA

Formation and circulation of aqueous humor intra ocular pressure detailed anatomy of the angle of the anterior chamber, Definitions, glaucoma ocular hypertension and hypotony. Role of genetics in glaucoma. Types, classification. Primary open angle glaucoma. Angle closure glaucoma. Secondary glaucoma. Congenital. Primary. Associated with various developmental anomalies. Absolute glaucoma, Clinical picture of each type, mechanism, and pathogenesis. Differential diagnosis of each type. Provocative test for glaucoma, open and closure. Medical and surgical treatment.

14.OCULAR TRAUMA

Trauma of eyeball trauma to ocular adnexa. Clinical examination of an eye with trauma. Types perforation and non perforating. Offending source chemical solutions foreign body blunt object sharp object knife scissors. Intraocular Intraocular Foreign Body (FB) (metal, glass, others). Investigation and localization of FB. Clinical pictures and management of perforation and non perforation injuries. Effects of intraocular retained FB (siderosis). Sympathetic ophthalmia endophthalmitis panophthalmitis. Enucleation evisceration in event of gross irreversible damage. Trauma to adnexa lids orbit.

15. VITREOUS

Applied anatomy and physiology. Examination of vitreous. Vitreous floaters, haemorrhage, detachment. Vitreous retraction. Vitreous degeneration syneresis asteroids synthesis. Vitreous surgery.

16.DISEASES OF RETINA

Applied anatomy and physiology,Congenital anomalies,Commotion retinae,Retinal artery occlusion,Retinal vein occlusion,Retinitis pigmentosa,Cystoid degeneration,Senile macular degeneration, Retinal detachment primary secondary principles of management retinoblastoma.

17.PUPIL

Pupillary pathways and pupillary reflexes. Dilated pupil constricted pupil. Pupil in various diseases. Pupil in head injury. Tonic pupil horner's syndrome. Argyll Robertson pupil. Action of drugs in pupil.

18. OPTIC NERVE

Applied anatomy and physiology. Opticneuritis get to number neuritis, Papilledema. Optics atrophy, Demyelinating diseases. Toxic alcoholic and tobacco amblyopia's.

19.NEURO OPHTHALMOLOGY

The optic pathways applied anatomy and physiology, Lesions and tumors affecting optic chasm Disorders and syndrome affecting III IV VI CN, Nystagmus physiology and pathologic. Ocular manifestations of cerebral and cerebellar tumors. Ocular manifestations of head injuries. Ophthalmologic migraine neurofibromatosis, Myasthenia gravis. Diane syndrome. Marcus Gunn phenomenon.

20.DISEASES OF THE ORBIT

Applied anatomy and physiology of its content. Exophthalmos proptosis enophthalmos. Inflammatory orbital diseases, orbital cellulite, pseudo tumors. Cavernous sinus thrombosis. Orbital tumors primary secondary metastatic. Orbital injuries foreign body contracted socket.

21. SYSTEMIC OPHTHALMOLOGY

Hypertensive retinopathy. Ocular manifestations of anaemia leukaemia. Diabetic retinopathy. Thyroid gland disorders, graves disease. Vitamins deficiency A, B1, B2, C,. Granulomatous diseases, tuberculosis, syphilis, toxoplasmosis. Sarcoidosis. Viral diseases, herpes simplex, herpes zoster, rubella syndrome. Collagen diseases, ocular manifestation. Rheumatoid arthritis. Reiter disease. Giant cell arthritis. Behcets disease. Marfan syndrome. Albinism. Vogt koyanagi harada syndrome. Myasthenia gravis. Myotonia dystrophia.

22. OCULAR MOTILITY AND SQUINT

Anatomy and physiology of extra ocular muscles and nerves, Your muscles conjugate movement control of movement, Ocular movements ductions. Binocular vision, stimulating perception vision, and stereopsis. Examination of case of squint,Heterophorias heterotropia,Paralytic non paralytic concomitant. Etiology clinical pictures of III VI IV nerve pansies. Objectives and principles of management of heterophorias, and heterotropia muscle surgery. Amblyopia prevention and treatment.

23. PAEDIATRIC OPHTHALMOLOGY.

The normal eye in infant and children. Congenital eye defects, retrolental fibroplasias. Developmental body defects associated with ocular defects. Post natal ocular problems. Test of visual acuity.

24. PREVENTIVE OPHTHALMOLOGY.

Elimination of hazards to the eye caused by accidents improper use of drugs. Use of properly fitted safety goggles, early recognition of diseases glaucoma trauma refractive errors infections, Prevention of neglect and detection of eye diseases in patient being

treated for other illness. Prevention of radiation injury, exposure keratitis, and vitamin deficiency.

25. OCULAR TUMOR.

Benign and malignant epilpar tumor, iris tumor, tumor of the choroid,retinal tumor and vascular retinal tumor.

CLINICAL TRAINING IN OPHTHALMOLOGY

The clinical training is imparted to the undergraduate students during the five weeks after the theory lectures the program as under in the university teaching Tripoli eye hospital bed side clinics are conducted under the supervision of clinical tutor for the whole period . The group of 8-9 students are made to learn how to approach an eye patient clerking the clinical details of various types of common and uncommon diseases and then subjected to group discussion in the presence of guidance of the teacher. Outpatient coaching is given to the student in groups of 4 -5 who look the consultant and senior residents conducting the general OPD the students are demonstrated the anterior segment diseases refractive errors and fundus lesions.

TEACHING & LEARNING METHODS:

- Lectures
- Tutorials
- Case-Study / Clinical Presentations (bedside teaching)
- Skilllab

ASSESSMENT METHODS:

Allocated Marks: Total **100 Marks** in the form of:

-Midterm exam: 15 Marks
-Slides: 20 Marks
- Written Exam: 35 Marks.
-OSCE: 30 Marks.

LIST OF REFERENCES:

1. Kanski ophthalmology 7th edition.

FORENSIC MEDICINE & TOXICOLOGY (FT 440)

BASIC INFORMATION

Title	**Forensic Medicine &Toxicology**
Code	FT440
Units	4 units-11-hours/week
Duration	12 weeks
Prerequisites:	All basicnonclinicalcourses

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Understand the principles of forensic medicine, medico-legal systems, types of injuries, assault, illicit drugs, poisons, and their clinical correlation.
2. Identify logical thinking to set inquiries on the possible track in criminal matters and medico-legal problems.
3. Understand the basics of medical ethics, malpractice, and medical responsibility according to Libyan and Islamic laws and regulations.
4. Understand the general principles of analytical toxicology and its clinical applications.
5. Understand the types, actions, clinical features, circumstances, diagnosis, detection, and management of poisoning/overdose which operate on the human body.
6. Understand the criteria, clinical features, diagnosis, and general management of dependence-producing substances, and drugs**.**

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe medico-legal aspects of personal identification of living and dead human bodies.
2. Define diagnosis of death, postmortem changes, and postmortem decomposition.
3. Describe medico-legal aspects of general and special types of wounds, head injuries, and firearm weapons and injuries.

4. Describe the medico-legal aspects of pregnancy, delivery, abortion, infanticide, child abuse, and sexual crimes.
5. Describe principles of toxicology of common types of poisonous substances, and drugs that operate on human
6. Describe the criteria, clinical features, diagnosis, and general management of dependence producing substances and drugs abused in our community.
7. Describe types of malpractice and items of medical responsibility, ethical considerations of medical research involving human subjects.

B.INTELLECTUAL SKILLS

1. Interpret features of bone x- ray for identification.
2. Correlate between characteristics of wounds in museum specimens and photographs to reach to proper diagnosis
3. Correlate the features of different parts of firearm cartridges for proper diagnosis of firearm weapon used in injury
4. Discuss the medico-legal aspects of pregnancy, delivery, abortion, infanticide, child abuse, and sexual crimes.
5. Correlate the features of different types of poisonous and their plane of management
6. -Discuss the criteria, clinical features, diagnosis and general management of dependence producing substances and drugs abused in our community.
7. Discuss types of malpractice and items of medical responsibility, and ethical considerations of medical research involving human subjects.

C.PRACTICAL AND CLINICAL SKILLS

1. Examine bone and soft tissue specimens, photographs, x-rays, to write medico-legal reports in Arabic and English languages.
2. Diagnose the underlying cause of death.
3. Assemble the results of history and examination of patients with injuries in trauma units of different hospitals to write a standard medical report about an injury.
4. Practice the medico-legal aspects of pregnancy, delivery, abortion, infanticide, child abuse and sexual crimes.
5. Apply macroscopically on department laboratories seeds, capsules and roots of poisonous and assemble the results of history, clinical examination and laboratory test findings of patients with poisoning with drugs and chemicals or envenomation in admission units of different hospitals to be able to write astandard medical report about a case of poisoning.
6. Practice the clinical criteria, diagnosis and general management of dependence producing substances and drugs abused in our community.

7. Explore the fundamental of medical responsibilities and ethical considerations of medical research involving human subjects on their practice and avoid malpractice.

D.GENERAL AND TRANSFERABLE SKILL

1. Be prepared for the lifelong learning needs of the General practitioner regarding Forensic and toxicology field.
2. Use information and communication technology effectively in the field of Forensic and toxicology practice.
3. Present information clearly by all means including written, electronic and oral forms
4. Work effectively within a team.
5. Has the ability and ready to cooperate with community agencies in case of toxicological emergency/ national disaster management.
6. Recognize the importance of precise medical data collection. Interpret Laboratory results according to the available instruments in the department.
7. Analyze relevant current data and literature using computer information technologies and library resources in order to solve a toxicological problem or a clinical problem in the field of forensic medicine**.**

COURSECONTENT:

LECTURES/TUTORIALS

FORENSIC

- Introduction of Forensic Medicine.
- Medical Law and Ethics (*medical ethics*).
- Identification of: skeletal structure, dead body and living person. Signs of death and post-mortem changes [definition of death, signs of death, post-mortem changes, conditions replacing putrefaction, estimation of time passed since death, exhumation].
- Sudden Natural Death [definition, classification of causes, the sudden infant death syndrome].
- Medico-legal aspects of wounds/mechanical injuries [definition, report, types, importance, ante-mortem and post-mortem wounds, causes of death from wound].

- Injuries of special organs [injuries of the neck, injuries of the chest, injuries of the abdomen, injuries of the urinary bladder and the genitalia].
- Firearm injuries [classification, sequence of events of firing a cartridge, characters and diagnosis of firearm injuries, medico-legal aspect of firearm deaths].
- Head injuries [injuries of the scalp, skull fractures, cerebral injuries-injuries to the brain, clinical presentation, fate, membrane injuries and intracranial haemorrhages].
- Thermal injuries [causes and manifestations of different types, causes of death, medico-legal aspects of death from burn, death from cold].
- Asphyxia [definition, general post-mortem picture, types of violent asphyxia, medico-legal aspect, causes of death].
- Sexual offences [definition of rape, conditions of consent, investigation of a case of rape, unnatural sexual offences].
- Medico-legal aspects of pregnancy, delivery and abortion [medico-legal aspects, diagnosis, types of abortion, complications of abortion, intrauterine foetal age estimation].
- Infanticide [definition, signs of live birth, causes of death in infants, battered baby).
- Forensic Serology [blood stain identification, blood grouping, medico-legal aspects of blood groups].
- Transportation injuries [different types, autopsy findings].
- ForensicGenetics [DNA Typing and application: definition and related issues of DNA, methods of DNA typing, ways of collection and preservation of various DNA samples (human and non human), and the use of DNA in medico-legal practiceaccording to Libyan and Islamic laws].
- Autopsy [definition, procedures in autopsy and general incisions, learning the viscera and material to be preserved and different preservative and their uses].

TOXICOLOGY

- Introduction to Toxicology and General toxicology: [definition, nature action and diagnoses of poisons, classification of poisonings, factor modify action of poisonings, general approach to poisoned patient and general treatments].
- Corrosive poisons: [general characters of corrosives, general post mortem pictures, corrosive acids, alkalies and organic corrosives].
- Plant poisons: [atropine, hyoscyamine, hyoscine, strychnine, nicotine, aconitine, ergot, digitalis, cocaine, opium, and hallucinogenics].

- Metals poisons: [general characters, Arsenic, lead, mercury, iron, phosphorus, cadmium, antimony, iodine and effect of irradiation].
- Volatile & gaseous poisoning: [carbon monoxide, cyanide, alcohol, methanol, carbon tetrachloride, chloroform and war gases].
- Insecticides: [organophosphorus, carbamates, chlorinated insecticide, naphthalene, rodenticide and herbicides].
- Petroleum distillates: [kerosene, Gazoline and benzene].
- Therapeutic agents, [such as barbiturate, meprobamates, benzodiazepines, phenothiazines, salicylates, paracetamol and tricyclic antidepressants amphetamines].
- Animal Poisons & marine toxicology [tick paralysis, poisonous snakes, scorpions, spiders, bees and marine animals]
- Drugsand substances abuse: drug addiction & habituation, situational analysis of substance abuse, common substances of abuse and their effects, causes and risk factors of substance abuse medico-legal aspect of substance abuse, management of substance abuse].
- Food poisons: [bacterial food poisoning, botulism and staphylococcal poisoning), endogenous food poisonings].

PRACTICAL:

FORENSIC:

- Museum specimens for demonstration.
- Plastic models for wounds.
- Specimens' demonstration by the microscope as blood, hairs and fibres.
- Photos for specimens with comments.
- X-rays for identification of bones.
-Available instruments to be used as the Florence Microscope.

TOXOCOLOGY

- Detection of some heavy metals: mercury-arsenic & lead / Animal poisonsby **Riensch test** or using the available instrument.
- Demonstration using either samples of natural plants or photos or audio-visual aids of some toxic plant samples, **which include:**

♦ Atropa 192elladonna seeds. ♦Datura stramonium capsule and seeds.
♦ Datura Fastiosa seeds. ♦ Strychnus nux vomica seeds.
♦ Aconite root. ♦ Papaver somineferum capsule
♦ Cannabis stiva seeds leaves& stems. ♦ Nut Meg seeds

♦ Colocynth capsule and seeds. ♦ Castrol oil seeds.
♦ Croton oil seeds. ♦ Jalap root

- Demonstration of clinical toxicology using models of plastic model for adult and child for practice in toxicology of gastric lavage.

TEACHING & LEARNING METHODS:

- Lectures &Discussions given at Forensic &Toxicology Dept.
- Autopsy onsite demonstration at University hospital.
- Museum specimens for demonstration.
- Plastic models for wounds.
- Specimens' demonstration by the microscope as blood, hairs and fibers.
- Photos for specimens with comments.
- X-rays for identification of bones.
- Available instruments to be used as the Florence Microscope.

ASSESSMENT METHODS:

Allocated Marks: **100 Marks**:

Mid course examination, quizzes & attendance of practical lessons: 15 %
Final written examination: 55%
Practical examination **(OSPE)**:10%
Oral examination: 20 %

LIST OF REFERENCES:

1. Simpson's Forensic Medicine, J. Payne-James, R. Jones, S. Karch, J.Manlove, 14thED. 2019
2. Fundamental of Forensic Medicine and Toxicology, R. Basu, 4thED. 2019.
3. Modern Textbook of Forensic Medicine & Toxicology, Putul Mahanta. 2014.
4. Modern Medical Toxicology. V.V. Pillay. 4thED. 2013
5. Lippeincott's Manual of Toxicology, 2020.
6. Priciples of Forensic Medicines, ed. Staff members of forensic Medicne and medical Toxicology, Ain Shams University, 2015
7. Color Atlas of Forensic Medicine and Pathology, Charles Catanese. 2thED. 2016.
8. Medical Responsibility BetweenEthical Obligation and Statutory Duties, Fawzi Benemran, 2010.

FAMILY AND COMMUNITY MEDICINE II (CM442)

BASIC INFORMATION

Title	**Family and Community Medicine II**
Code	CM442
Units	4 units – 10 hours/week
Duration	12weeks
Prerequisites:	All basic non-clinical courses

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Develop knowledge, skills, and attitudes to practice the basic principles of prevention and management of common community health issues locally and globally.
2. Understand the occupational and environmental health risks, related diseases, and preventive measures.
3. Recognize approaches in a primary health care setting and apply international recommendations and ethical principles in clinical practice.
4. Identifying the most important infectious diseases in Libya.
5. Adopt and apply a healthy lifestyle and sound behaviors to become role models for the individuals, families, and communities they will serve in the future.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the basic concepts of PHC including health education, maternal and child health care, school health, mental health, and health care of adolescent, elderly and disabled patients.
2. Describe the distribution, causes, and methods of transmission and measures of prevention and control for important endemic infectious diseases including the standard precautions.
3. Discuss principles of non-communicable diseases, road traffic injuries, nutritional, occupational & environmental health-related problems including prevention and early diagnosis measures.

4. Acquired knowledge in immunization, cold chain, national immunization program, and global health.
5. Describe the counseling and consultation methods appropriate for the primary health care settings.
6. Demonstrate the red flags for different clinical conditions during family medicine practice.

B.INTELLECTUAL SKILL

1. Analyze and explain the health problems of mothers, children, adolescents, mental disorders, disabled patients, and health problems related to inappropriate nutrition.
2. Distinguish the importance of screening and periodic health examination.
3. Discuss occupational and environmental health issues and explains their background in human diseases.
4. Discover and deduces when a patient should be referred to a medical professional.
5. Distinguish the importance of behavior modification and counseling in PHC.
6. Decide the immunization schedule for children and travelers as a national recommendation.

C.PRACTICAL AND CLINICAL SKILLS

1. Diagnose and treat some common diseases in primary health care and Predict cardiovascular risk and diabetic foot risk
2. Practice appropriate communication skills, both orally and written, including case presentations, educational materials, and how to write prescriptions and referrals.
3. Apply health standards to assess occupational and school environment
4. Conduct nutritional assessment for children and calculate body mass index for adults
5. Apply good infection prevention and control practices including handwashing/rub technique, wearing PPE, and safety injection
6. Apply the best practice standards for storage and monitoring equipment required to maintain the cold chain and during providing vaccination.

D.GENERAL AND TRANSFERABLE SKILLS

1. Possess the ability to demonstrate appropriate communication skills with patients and colleagues.
2. Hold the ability to work in a team and respects the opinions of others.
3. Possess the ability to give presentations.
4. Use critical thinking, problem-solving, and decision-making skills.

5. Demonstrate self- learning ability.

COURSE CONTENT:

I. FAMILY MEDICINE:

- Principles of family medicine.
- Concepts and Principles of Primary Health Care.
- Bio-psychosocial model: concept, history, difference betweenbiomedical and bio-psychosocial model, description of bio-psychosocial model, importance, application and physician center approach, patient centered approach, advantages.
- Common medical problems encountered in family medicine approach (sore throat, back pain, headache, fatigue, anemia, diabetes, and hypertension).
- Red flags of different clinical situations encountered in family practice.
- Communication skills: importance, types, verbal communication skills: vocabulary, paralanguage, hand-on-doorknob syndrome; nonverbal skills: smile, touch, body language, listening skills, empathy. Skills in communicating with elderly, Skills in communicating with anger patient. Breaking bad news: definition, concept, steps (SPIKES).
- Counseling: concepts, stages, scopes, importance, features, benefit of counseling, role of family physician, counseling for behavior modeling, approaches or model, barriers for effective counseling.
- Consultation: definition, objectives, models, advantages, disadvantages, SOAP format.
- Cardiovascular disease risk assessment: WHO/ISH risk prediction charts, types, risk level
- Behavioral modification for obesity, smoking
- Basics of adolescent, disable and geriatric care
- Preventive Health Care and periodic health examination (PHE): definition, purposes, USPSTF recommendations, PHE according to age: screening, counseling, prevention.
- Domestic violence: definition, types, impacts, management and intervention.
- Medical prescription: definition, information includes.
- The referral system: definition, when to refer patient, factors affecting referrals, benefits of referral, the process of referral, referral letter outlines, different types of referrals, and level of referrals.

II- VACCINATION AND COLD CHAIN:

- Importance of vaccination and how vaccines work.
- Components, types , advantages and disadvantages of vaccines
- Adverse reactions to immunization
- Contraindications & precautions of vaccination
- Causes of vaccination failure
- Factor affecting vaccine potency
- EPI, NPI
- Cold chain: definition, elements, levels, storage equipment, loading of the storage equipment, monitoring equipment.

III- EPIDEMIOLOGY OF INFECTIOUS DISEASE:(epidemiological triad, mode of transmission, prevention and relevant National programmes):

a) Air borne infection:

Chickenpox, Measles, Rubella, Mumps, Influenza, Diphtheria, Whooping cough, Haemophilus influenzae type B, Meningococcal meningitis, Tuberculosis

b) Water and food borne infection:

Poliomyelitis, Viral hepatitis, Acute diarrheal diseases, Cholera, Typhoid, Paratyphoid, Food poisoning, Amebiasis, Schistosomiasis

c) Arthropod & blood borne infection:

Malaria, Hepatitis B, C, AIDS.

d) Zoonotic diseases: Rabies, Yellow fever, Rickettsial diseases, Plague, Brucellosis, Leishmaniasis, Hydatid disease.

e) Surface infection: Tetanus

f) Emerging & re-emerging infectious disease: definition, contributed factors, examples of diseases, strategy to reduce threats.

g) Travel medicine: importance, travel clinic, pre-travel guidance, approach, risks to traveller, concerns, travel advices, precautions, post travel evaluation**.**

IV- OCCUPATIONAL HEALTH:

- History, Definitions, Basic concepts and principles
- Occupational hazards classification
- Prevention of occupational diseases and personal protective equipment
- Occupational ergonomic and hygiene.
- Occupational chemical exposure:
  - a- Mode of entry of harmful substance
  - b- Toxicity factors
  - c- Occupational heavy metal exposure:

d- Toxic inhalant: metal fume fever, polymer fume fever, organic dust toxic syndrome, common gases (asphyxiant and irritant) , VCM gas intoxication
e- Occupational lead poisoning: chemistry, uses, mode of exposure, work place exposure, mode of toxicity , clinical finding, lab finding
f- Occupational chromium poisoning: chemistry, uses, mode of exposure, work place exposure, mode of toxicity , adverse health effect
g- Occupational mercury poisoning: chemistry, uses, mode of exposure, work place exposure, mode of toxicity , adverse health effect

- Occupational physical hazards:
  a- Noise: hearing threshold, hearing loss: causes, presentation, evaluation, hearing conservation program.
  b- Vibration: risky group, pathology, presentation, complication, control and prevention
  c- Heat hazards: heat disorders: causes, presentation, lab finding, complication, indices of thermal stress
- Occupational lung disease:
  a- Organic Dust diseases: Byssinosis
  b- Mineral dust disease: Pneumoconiosis: types, causes, exposure sites, pathology, presentation, clinical and radiological finding, preventive measures.

V- ENVIRONMENTAL HEALTH :

- Basic concepts, component of environment. Health hazards arising out of environmental conditions.
- Environmental risk assessment
- Causes, effect and control and preventive measures of:
  a- Air pollution
  b- Water pollution
  c- Soil pollution
  d- Marine pollution
  e- Thermal pollution
  f- Nuclear hazards
  g- Solid waste management.
  h- Role of individual in prevention of pollution
- Pollution case study
- Disaster management: floods, earthquakes, cyclones, landslides.

VI- INFECTION PREVENTION AND CONTROL:

- Standard precaution: definition, types, hand hygiene, safety injection, use of PPE.
- Instrument reprocessing: risk to patients from equipment, decontamination levels, methods of instrument reprocessing.
- Aseptic techniques: definition, general guidelines.
- Environmental cleaning: definition, protective clothing for cleaning, hospital environment risks.
- Disinfectant use: indication, types.
- Waste management: definition, types of wastes, management.
- Cough etiquette and respiratory hygiene
- Transmission based precautions: contact precaution, droplet precaution , air borne precaution.

VII- NUTRITION AND HEALTH:

- Balanced diet: (middle eastern, vegetarians, Islamic and hindu, Libyan)
- Nutrients: carbohydrates, fat, protein, vitamins, minerals
- Probiotics
- Nutrient recommendations
- Nutrition guidelines: MyPyramid and My Plate.
- Malnutritional problems:

a- Protein energy malnutrition: definition, magnitudes, causes, types, underweight, stunting, wasted, marasmus, kwashiorkor, failure to thrive. Screening for under nutrition, prevention of PEM

b- Iodine deficiency disorders: IDD problem pyramids, prevention

c- Vitamin A deficiency: causes, stages of xerophthalmia, food sources of vitamin A, prevention

d- Vitamin D deficiency: causes, presentation, sources of vitamin D, immunologic effect of vitamin D, vitamin D in human disease states, cardiovascular effect of vitamin D, interrelationship of vitamin D and cancer

e- Osteoporosis: definition, causes, sites, diagnosis, prevention

f- Zinc: importance, deficiency, clinical features, sources

- Nutritional assessment: definitions, determinants of growth and development, nutrition assessment objectives, methods: direct and indirect; weight, height, head and chest circumferences,weight for age, weight for height, mid upper arm circumference, reference and standard values, WHO growth charts. Assessment methods of nutritional status of adult: Brocca index, BMI, waist circumferences, waist hip ratio.Biochemical and laboratory evaluation, dietary intake assessment, vital health statistics, assessment of ecological factors.

- Nutrition related chronic diseases:
    a- Over weight / Obesity: dietary treatment of obesity. Exercise, pharmaceutical treatment, surgical treatment
    b- Diabetes mellitus: nutrition related risk factors, nutrition related prevention, diabetic plate, glycemic index chart, and diabetic food exchanges (daily), alternative sweeteners, Paleo diet.
    c- Coronary heart disease: nutrition related risk factors, nutrition related prevention,
    d- Hypertension / stroke: nutrition related risk factors, nutrition related prevention, DASH diet
    e- Cancer: nutrition related risk factors, nutrition related prevention

VIII- MENTAL HEALTH;

- Definitions.
- Characteristics of mentally healthy person.
- Mental disorders: magnitude, importance, impact, causes and determinants.
- Types of mental illnesses.
- Generalized anxiety disorders: definition, risk factors, prevalence, onset, course, associated problem, treatment.
- Phobic disorders: definition, types.
- Obsessive compulsive disorder: definition, etiology, prevalence, onset, course, treatment.
- Post-traumatic stress disorders: definition, etiology, prevalence, onset, presenting symptom, treatment, prevention.
- Mood disorders: definition, causes, types.
- Depression: definition, causes, presenting symptom.
- Substance related disorders: burden, process, types, criteria, severity ratings for substance use disorders, diagnosis, warning signs, indicators, risk factors, most popular drugs used, long term effects, Prevention elements and approaches.
- Stigma: definition, effects, how can challenge stigma?
- Prevention programs of mental disorders

IX- EPIDEMIOLOGY OF NON-COMMUNICABLE DISEASES (NCDS):

- Epidemiological transition
- NCDs: Definition, characteristics, types (Hypertension, diabetes, cancer, overweight and obesity, stroke, blindness) , burden, risk factors, general outlines for prevention and control
- Role of PHC physician in prevention and control of NCDs.

X- **ACCIDENTS AND INJURIES:**

- Definition,magnitude, risk factors
- Epidemiological triad of RTI, measurements of the problem (mortality, morbidity, disability), trends worldwide and in Libya, prevention

XI- IN SCHOOL HEALTH:

- Definition, importance, objectives of School Health.
- Aspects of School Health Services: health appraisal of school children, preventive services, remedial measures and follow up, healthful school environment, nutritional services, first aid and emergency care, mental health, dental health, eye health, health education, school health records
- Physical school environment recommendations: location, site, structure, class room, furniture, doors and windows, ventilation, lighting, glare, color, water supply, eating facility, acoustic comfort, rest room, safety and security.
- Positive emotional environment

XII- GLOBAL HEALTH

- Definition, concerns, why, key principles
- Difference between global health and public health.
- Examples of global health issues
- Sustainable development goals
- Global health concepts.
- The global burden of diseases and risk factors
- The organization and function of health system.

Clinical Topics:

1. Approach to patient with common complain (Sore throat, headache, low back pain, fatigue)
2. Approach to patient with chronic disease (diabetes & hypertension, hepatitis B)
3. Analyze the epidemiological data of patients with infectious diseases (hepatitis, AIDS). Dealing with Hepatitis B Chronic Carrier (Family protection).
4. Recognize the methods of safe injections and safe blood transfusion.
5. Diagnose TB and attend the DOTS clinic, leishmaniasis clinic.

6. Conducting appropriate appraisal of the school students` current health status and assess the school environment.
7. CV risk assessment.
8. Diabetic foot care.

Topics for practice and discussion:

1. Communication skills in history taking for common problems.
2. Communication skills in special occasions (breaking bad news, elderly patient, counseling).
3. Nutritional assessment.
4. Vaccination & cold chain.
5. Writing prescription & referral.
6. Hand hygiene.
7. Protective measures for air borne diseases (COVID-19).

TEACHING AND LEARNING METHODS:

- Illustrated lectures
- Group discussion
- Practical
- Clinical sessions
- Field visits

ASSESSMENT METHODS:

Total: 100 marks

- Attendance and the activity: 5%
- Midterm exam (MCQ): 20%
- Final written exam (MCQ and problem solving and essay): 45%
- Clinical final exam (OSCE): 30%

LIST OF REFERENCES:

1. Department lecture notes
2. Park K. Park text book of preventive and social medicine. 22nd edition.Banarsidas bhanot-jabalpur. 2013.
3. Rakel RE**.** Essentials of Family Practice Medicine, Fundamentals and Case Studies. 8th edition. 2011 Saunders, An Imprint of Elsevier (available online on MDconsult through SDL)

4. Simon, Chantal, et al.Oxford handbook of general practice**.** Oxford University Press, 2014.
5. John Murtagh AM, Jill Rosenblatt. Murtagh`s general practice.Sixth edition. MC Graw Hill education. 2015.

SECOND CLINICAL SEMESTER/ OBSTETRICS AND GYNECOLOGY (OG480)

BASIC INFORMATION

Title	**Obstetrics and Gynecology**
Code	OG480
Units	8units – 19 hours / week
Duration	12 weeks
Prerequisites:	All basic nonclinical courses

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able:

1. Understand the basic sciences of Obstetrics and Gynecology.
2. Identify the problems and diseases of the pregnant woman.
3. Differentiate between normal and abnormal labour.
4. Recoganize serious gynecological problems and diseases.
5. Apply appropriate knowledge and skills about important gynecological procedures.
6. Introduce the student's with basic knowledge of counseling and communication skills.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Recognize the basic surgical anatomy and embryology of the female pelvis, physiology of menstruation and pregnancy.
2. Describe normal and abnormal pregnancies and their antenatal care.
3. Differentiate between normal and abnormal labour and its management.
4. Identify common emergencies in obstetrics and their management.
5. Describe common gynecological problems and their management.
6. Identify benign and malignant gynecological conditions.
7. Identify important gynecology procedures.
8. Determine Counseling and communication skills.

B.INTELLECTUAL SKILLS

1. Discuss the basic surgical anatomy and embryology of the female pelvis, physiology of menstruation and pregnancy.
2. Interpret patient's data in an organized and informative manner to differentiate between normal and abnormal pregnancy including their antenatal care.
3. Discuss normal and abnormal labour and its management.
4. Analyze common emergencies in obstetrics and their management.
5. Discuss common gynecological problems and formulate their management.
6. Give examples of different benign and malignant gynecological conditions.
7. Discover how to do important gynecology procedures in different situations.
8. Give examples of different situations used in counseling and communication.

C.PRACTICAL AND CLINICAL SKILLS

1. Conduct the basic surgical anatomy and embryology of the female pelvis, physiology of menstruation, and pregnancy.
2. Apply and record patient's data in an organized and informative manner and clinical examination to differentiate between normal and abnormal pregnancy.
3. Practice plan of management of normal and abnormal labour.
4. Prepare first aid measures for common obstetric emergency conditions.
5. Prepare management plans for common gynecological problems.
6. Discover different benign and malignant gynecological conditions.
7. Practice important gynecology procedures in different situations.
8. Suggest different situations used in counseling and communication.

D.GENERAL AND TRANSFERABLE SKILLS

1. Respect the patients, colleagues and any other members of the health profession.
2. Possess the ability to give presentations.
3. Present medical information in written and oral forms.
4. The ability to work effectively with others on a common task.
5. Possess the ability to use a computer to search for information related to the course.
6. Manage time effectively.
7. Practice self and peer evaluation.

COURSE CONTENT:

I - LECTURES/ TUTORIALS

BASIC OBSTETRICS AND GYNECOLOGY:

Anatomy, Embryology, Physiology of pregnancy, Biochemistry & molecular genetics, Physiology of menstruation, Diagnosis of pregnancy, Anti-natal care, Normal pregnancy and puerperal, Maternal and perinatal morbidity and mortality, Ultrasound scan in obstetrics and gynecology, Communication skill, Medical ethics, Evidence based medicine.

BLEEDING IN PREGNANCY

Early pregnancy bleeding, late pregnancy bleeding, Post-partum hemorrhage, Shock in obstetrics, Blood transfusion.

ABNORMAL PREGNANCY AND PREGNANCY COMPLICATION

Multiple pregnancy, Intra-uterine fetal death, Ante-natal screens and diagnosis of abnormal fetus. Ante-natal fetal assessment and monitoring, Normal and abnormal fetal growth, Polyhydraminous and oligohydrasminous, Rhesus iso-immunisation and ABO problems

LABOUR

Normal labour, Abnormal labour [shoulder dystocia], Pain relief in labour, Pre-term labour, delivery, PLROM, Mal-position, mal-presentation, Instrumental delivery, Caesarian section, c/s hysterectomy, Prolonged pregnancy, IOL, Abnormal puerperal.

MEDICAL DISORDER OF PREGNANCY

Anemia including heamoglobinopathy, Hypertension, pre-eclampsia, Diabetes mellitus, Urinary tract infection,Vomiting in pregnancy,Thrombo-embolism,Cardiac, respiratory, epilepsy in pregnancy, Ante-natal infection, Jaundice in pregnancy, Psychiatric disorder in pregnancy and puerperal.

GYNECOLOGY: (REPRODUCTIVE MEDICINE)

Menstrual disorder, Puberty & menarche, Amenorrhea, Pre-menstrual tension, Menorrhagia. PCB, IMB, PMB, Fertility Control, PCO, hirsutism, Intersex, Infertility, Menopause and HRT.Hormonal therapy in gynecology,Human sexuality.

PELVIC PAIN

Endometriosis and adenomyosis, P.I.D, Pelvic congestion syndrome, Vaginal discharge, Sexual behavior.

GYNECOLOGICAL PROCEDURE

Dilatation and Curettage, Laparoscopy, hysteroscopy, colposcopy, Major gynecological surgery.

URO-GYNECOLOGY INCLUDING PELVIC R ELAXATION

Utro-vaginal disease & prolapsed, Urodynamic, Urinary incontinence, Urinary fistula, Urinary retention.

GYNEONCOLOGY ONCOLOGY

Disorder of the vagina and vulva, Disorder of cervix and uterus, Disorders of the ovary and tubes, Gestational trophoblastic neoplasm, Counseling in gynecology,Pallative care.

I I -CLINICAL SESSIONS: -

-BED SIDE TEACHING: By Teaching Staffs

III -PRACTICLE (SKILL LAB)

I- Obstetric history and examination

1. Obstetric history
2. Obstetric examination

II- Labour

1. First and second stage
2. Third stage and episiotomy
3. CTG
4. Partogram

III- Emergency

1. Shoulder dystocia.
2. Postpartum hemorrhage
3. Eclampsia
4. Acute pulmonary embolism

IV-Gynaecology

1. Taking gynecological history
2. Speculum and biannual examination
3. Taking vaginal swab and cervical smear
4. Insertion and removal of intrauterine contraceptive device

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorial classes; (group discussion & case studies).
- Bedside teaching and demonstration: training in small groups.
- Audiovisual aids use at faculty of medicine skills laboratory in small groups.

ASSESSMENT METHODS:

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Total Marks 200

- Attendance: 5%
- Lab. Examination: 5%
- Final exam:
- Written:40%
- OSCE: 50%

LIST OF REFERENCES:

1. Obstetric by ten teachers.
2. Gynagology by ten teachers.
3. Oxford textbook of obstetric and gynecology.
4. Obstetric illustrated.
5. Gynacology illustrated.

THIRD CLINICAL SEMESTER/ PEDIATRICS (PD480)

BASIC INFORMATION

Title	**Pediatrics**
Code	PD480
Units	8 units–22 hours/ week
Duration	12 weeks
Prerequisites	All basic non clinical courses

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:

1. Recognize the normal and abnormal neonate and child including growth and development.
2. Understand essential health care and nutritional needs for neonates, infants, children, and adolescents.
3. Apply and modify history taking, examination skills, and therapeutic prescribing to neonates, infants, children, and young people.
4. Acquire essential knowledge and practical skills to manage common diseases and emergencies in neonates, pediatrics, and adolescents.
5. Acquire essential knowledge and practical skills to standard management plans for common diseases and emergencies situation in neonates and pediatrics and adolescents.
6. Discuss the appropriate knowledge and skills for disease prevention and child protection.
7. Apply an appropriate skill for problem-solving.
8. Acquire Lifelong-learning competencies required for continuous professional development.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe normal growth and development throughout the neonate, pediatric, and adolescent periods.
2. Explain abnormalities of growth and development in neonates and pediatric and adolescent periods.
3. Identify nutritional requirements for healthy infants and children and nutritional requirements for common nutritional disorders affecting the pediatric age group.

4. Distinguish between the common causes, pathogenesis, clinical symptoms, signs, and prognosis of the most common neonatal and pediatric diseases.
5. Describe a management plan for common diseases in neonates and pediatrics.
6. Describe symptoms and signs for emergencies situation in neonatal and pediatric, and their management plan.
7. Determine the most important behavioral and social issues during childhood and adolescence.
8. Differentiate between indications, contraindications, and precautions of the immunizations necessary for infants and children according to the Libyan immunization program.
9. Identify the basic knowledge of safety issues and disease prevention.

B.INTELLECTUAL SKILLS

1. Discuss patient's data, clinical examination and investigations regarding normal growth, and development for all pediatric age groups.
2. Analyze abnormalities of growth and development in neonates, pediatric and adolescent periods.
3. Formulate nutritional requirements for healthy and the most common nutritional disorders affecting the pediatric age group.
4. Discuss the common causes, pathogenesis, clinical symptoms, signs, and prognosis of the most common neonatal and pediatric diseases.
5. Formulate a management plan for common diseases in neonates and pediatric.
6. Formulate emergency management for neonate and pediatric life-threatening conditions.
7. Discover the most important behavioral and social issues during childhood and adolescence.
8. Give examples of indications, contraindications, and precautions of the immunizations necessary for infants and children according to the Libyan immunization program.
9. Formulate safety issues including drug safety and disease prevention.

C.PRACTICAL AND CLINICAL SKILLS

1. Conduct adequate growth and development assessment for normal different pediatric age groups using anthropometric assessment.
2. Discover abnormalities of growth and development assessment for different pediatric age group using anthropometric assessment.
3. Practice nutritional assessment for infants, children and adolescents.

4. Apply and record good detailed history for patients, practice an adequate general and systemic examination, for patients in different pediatrics age group.
5. Practice plane of management for common disease in neonates and pediatrics age group.
6. Prepare first aid measures for different neonatal and pediatric emergencies; demonstrate competently basic life support and cardiopulmonary resuscitation in a pediatric manikin.
7. Suggest the most important behavioral and social issues during childhood and adolescence.
8. Practice indications, contraindications, and precautions of the immunizations necessary for infants and children according to the Libyan immunization program.
9. Prepare safety Issues and disease prevention.

D.GENERAL AND TRANSFERABLE SKILLS

1. Respect the patients, colleagues and any other members of the health profession.
2. Possess the ability to give presentations.
3. Present medical information in written and oral forms.
4. The ability to work effectively with others on a common task.
5. Possess the ability to use a computer to search for information related to the course.
6. Self- learning ability.
7. Manage time effectively.
8. Practice self and peer evaluation.

COURSE CONTENT:

I - LECTURES AND TUTORIALS

Ⅰ. GROWTH:

(1)NORMAL GROWTH AND PUBERTY: Normal growth stages (including pubertal stages), Growth assessment, normal variants of pubertal development.

(2) SHORT STATURE: Differentiate genetic and constitutional growth delay from pathological short stature, common causes of short stature, causes of growth hormone deficiency , diagnostic investigations and management of GHD

(3) APPROPRIATE USE OF CENTILE CHARTS:

Different types of centile charts, WHO centile charts, how to use centile charts appropriate for the sex and age of the child, recognition of deceleration or acceleration of growth.

(4) DISORDERS OF PUBERTY: Definition of delayed and precocious puberty, causes of delayed puberty and common causes of precocious puberty, investigations plan for precocious puberty.
(5) ABNORMAL HEAD GROWTH: Head size measurement method, definition of microcephaly and macrocephaly, common causes of micro- and macrocephaly, clinical approach of a baby with abnormal head size.

II. GENERAL

(1) CHILD WITH PUFFINESS OF FACE AND EDEMA:- The main causes of oedema (nutritional, renal, cardiac & hepatic), clinical features and clues for each of the main causes, relevant investigations for a child with oedema.
(2) A CHILD WITH A SKIN RASH :- The types of rashes (erythematous, vesicular, urticaria, purpura) ,itchy or not, common characteristic rashes and their other associated features (Measles, Rubella, Herpes simplex, Chicken pox,Rickettsia ,Scabies,Candida ,Eczema, Sebeorrheic dermatitis,Cafe- au-lait spots, E Multiforme, E. Nodosum, meningococcal rash, HSP . Epidemiology, typical clinical features, investigations management and prognosis.
(3) FOCUSED HISTORY TAKING:-The proper structured focused history taking based on the problem of main system involved , linking different symptoms ,asking relevant questions that will help in assessing the severity or helping in the differential diagnosis.
(4). VITAL SIGNS:
The normal and abnormal values and characteristics of temperature, pulse, respirations, and blood pressure for infants and children, methods of measuring temperature and blood pressure, the sites for assessing the pulse and blood pressure.Appropriate Use of BP centile chart.
(5) DRUG PROPHYLAXIS:
Definition, antibiotic and antifungal dug prophylaxis indications, dug prophylaxis in certain patients like immunodeficiency, asthma , surgery , some hematological diseases, some neonatal conditions like baby born to the HIV positive mothers and others .

III. NEONATOLOGY:

(1) RESPIRATORY DISTRSS IN NEWBORN:- List the causes of respiratory distress (RD) in neonates, description the clinical presentation of RD in neonates, how to approach a neonate presented with RD and list a differential diagnosis based on the history & physical examination, Outlining the management (investigations & treatment) of common causes of RD in neonates.
(2) NEONATAL SEPSIS: The risk factors for infection in the newborn, related mortality and morbidity, common symptoms and signs, management plan and prevention methods.
(3). NEONATAL SEIZURES: Common causes of neonatal seizures, subtle seizures, investigations and the ste & examination.

(4). THE NORMAL NEOBORN: Normal care of newborn baby, the components of the APGAR score, neonatal resuscitation, benign abnormalities seen in newborn, neonatal screening programs.
(5) NEONATAL JAUNDICE: Bilirubin metabolism, physiological and pathological neonatal jaundice, the causes of pathological neonatal jaundice & prolonged neonatal jaundice, Kernicterus risk factors, management plan for unconjugated hyperbilirubinemia.
(6) PROBLEMS OF PRE-MATURITY& BIRTH WEIGHT:
The incidence & epidemiology of prematurity, the method of assessing gestational age, management of the preterm babies, common long-term sequel of prematurity, definitions of small for gestational age (SGA), low birth weight (LBW) and large for gestational age(LGA),disadvantages and common short-term problems of SGA& LGA
(7) APPROACH AND MANAGEMENT OF SICK AND BLUE BABY:
Recognition of sick newborn(clinical picture), important features in the maternal & newborn history, the presenting symptoms and signs of sick newborn, How to approach the sick / blue baby (D/D &plan of management), How to approach to cyanotic newborn (D/D &plan of management).
(8) INFANT OF DIABETIC MOTHER & ELECTROLYTES IMBALANCE IN NEONATES: normal values of serum glucose &electrolytes (Na+, K+, Ca++, Mg+) and blood gases, daily requirement of Vit. D & K, common causes and of electrolyte disturbance, common complication of IDM.

IV. NUTRITION:
(1) INFANT FEEDING / BREAST FEEDING:
the daily water and calories requirements during infancy, the benefits of breast feeding, the current recommendations regarding breast feeding, importance of exclusive breast feeding, the current recommendations regarding infant weaning.
(2) COMMON NUTRITIONAL DISORDERS:
Definition of the terms “overweight”, “obesity”, “protein energy malnutrition", the important risk factors for childhood obesity, the common nutritional deficiencies in Libya, relevant features of the history and examination, the appropriate management plan, the clinical features and treatment of calcium and vitamin D deficiency.

(3) NUTRITIONAL ASSESSMENT:-
The daily water and calories requirements, the daily requirements of important vitamins and minerals, how to take proper dietary history, performing Clinical examination assessing the General condition, facial appearance and physical signs of nutritional deficiency, How to Measure the child’s weight and length (<2 years of age) or height (>2 years of age) and Head circumference, Determining weight-for-length or

weight-for-height and weight-for-age, using the standard growth charts according to the child's age and sex, assessing mid-upper arm circumference (MUAC).

V. RESPIRATORY SYSTEM

(1) CHILDHOOD ASTHMA: The pathogenesis of asthma, common presentation, important features in history (including environmental factors) and examination related to chronicity, severity of chronic asthma and acute asthma attacks, management acute asthmatic attack and long term chronic asthma prophylaxis.

(2)THE CHILD WITH RISPIRATORY INFECTION (UPPER& LOWER RTI): common causes of fever and cough, clinical features suggestive of pneumonia, WHO classification of Acute Respiratory Illness, principles of management.

(3) THE CHILD WITH CHRONIC COUGH: Causes of a chronic cough (CF, bronchiectasis, TB, postnasal drip, FB inhalation, GOR, immunodeficiency, CHD), differentiating features in the history and examination, appropriate first line investigations and general management plan.

(4) DIFFERENTIAL DIAGNOSIS IN A CHILD WITH RECURRENT WHEEZE: common differential diagnosis and general management plan for common causes. (5) ACUTE BRONCHOLITIS (AB): Clinical features suggestive of AB, the common pathogens causing AB, the differential diagnosis of AB, investigations and principles of management of AB.

(6) DIFFERENTIAL DIAGNOSIS IN A CHILD WITH UPPER AIR WAY OBSTRUCTION: define different respiratory noisy sounds (stridor, snoring, grunting, wheeze, rattle), the common differential diagnosis for each,
the general management plan for common causes (e.g. larengeomalicia, croup, FB).

(7) CYSTIC FIBROSIS: Identify the etiology and pathophysiology of CF, the clinical manifestations of CF, relevant investigations and treatment principles of CF, common complications, prognosis and impact of the disease on the patient and the family.

VI. CARDIOVASCULAR SYSTEM

(1)ACQUIRED HEART DISEASES: The etiology & clinical features and management of myocarditis and Kawasaki disease.

(2) CONGENITAL HEART DISEASES: The basic classification, different ways of CHD (cyanotic/ A cyanotic) presentation, the management and indications for endocarditis prophylaxis.

(3) HEART FAILURE: The pathophysiology of heart failure, common causes of heart failure according to the child's age, important symptoms and management principles.

(4) HYPERTENSION IN CHILDREN: Definition, measurement techniques, pathophysiology&. Causes of hypertension in children (basic classification by system with examples), clinical presentation of hypertension in children, risk factors for

hypertension in children (obesity) and its prevention, principles of management of hypertension in children.
(5) NORMAL PEDIATRIC ECG: Definition of ECG, indication of ECG, component of ECG, typical normal ECG leads finding, how to read ECG.
(6) ABNORMAL PEDIATRIC ECG AND ARRYTHMIAS: Recognition of abnormal ECG finding in different congenital or acquired heart problems, types of Arrhythmia**.**

VII. RHEUMATOLOGY

(1) THE CHILD WITH CHRONIC ARTHRITIS: Definition of arthralgia, arthritis &chronic arthritis, types of juvenile idiopathic arthritis (JIA), clinical features of different sub-types of JIA, principles of investigation and treatment.
(2) CHILDHOOD VASCULTIS: Definition of vasculitis, types of vaculitis in children, clinical features of Henoch – schonlein purpura (HSP), criteria for diagnosis of HSP, management of HSP, criteria for diagnosis of Kawasaki disease (KD), treatment approach and recognize the complications of KD.
(3) THE CHILD WITH ACUTE LIMPING: Normal gait cycle, definition of limping, causes of acute limp, differentiate causes based on clinical features (irritable hip& slipped Capital femoral epiphysis /septic arthritis), relevant investigations required, treatment of common causes of limping.
(4) PGALS:
Definition of PGALS, Performance of a simple , quick and acceptable MSK examination in children by using PGALS, distinguish the normal finding from abnormal in the musculoskeletal examination.

VIII. GASTROENTEROLOGY

(1). CHRONIC DIARRHOEA (MALABSORBTION): Definition of chronic diarrhea, common causes of chronic diarrhoea (Celiac, giardiasis, toddler's diarrhea, CMPI), principles of management of common causes of chronic diarrhea.
(2). FAILURE TO THRIVE: Definition of the term “failure to thrive” in the context of normal patterns of growth, distinguish between organic and non-organic failure to thrive, the key features in the history and physical examination, relevant investigations required and their rationale and management plan.
(3) ACUTE DIARRHOEA AND VOMITING: Pathogenesis of vomiting and diarrhea, causes of vomiting and diarrhea, relevant features on history and clinical examination, assessment of the degree of dehydration clinically, appropriate investigations, the role of fluid therapy (oral and intravenous, maintenance, deficit and ongoing loss) , composition of the WHO oral rehydration solution, complications of mismanagement and how to avoid them
(4) ASSESSMENT OF DEHYDRATION: review common causes of dehydration (intake / loss), assess hydration status clinically (history and examination), identify the

composition of the WHO oral rehydration solution, fluid therapy (oral and intravenous, maintenance, deficit and ongoing loss), the role of investigations in assessing and managing dehydration, common complications of mismanagement and how to avoid them.

(5) CONSTIPATION AND ENCOPRESIS: Pathophysiology of constipation and encopresis, common causes of constipation, differentiate between organic and non-organic constipation, features in the history and examination which guide diagnosis, the principles of management.

(6) DIFFERENTIAL DIAGNOSIS OF VOMITING: The deference between vomiting / regurgitation, common medical and surgical causes of vomiting according to age, relevant features on history and clinical examination, appropriate management plan (GOR and Pyloric stenosis).

IX. NEUROLOGY:

(1) A FEBRILE CHILD WITH ABNORMAL MOVEMENTS (EPILEPSY):

Definition of seizure and epilepsy, common causes of seizure & epilepsy, classification of the types of epilepsy, the role of EEG and brain imaging, relevant clinical features that differentiates between fits and faints, management of the convulsing child / status epilepticus, principles of long term treatment of epilepsy.

(2) FEBRILE CHILD WITH ABNORMAL MOVEMENTS (FEBRILE SEIZURES & CNS INFECTION): Definition of febrile convulsion & types, epidemiology and prognosis, suspicions of meningitis and encephalitis, contraindications for lumbar puncture, principles of treatment of meningitis, common complication of meningitis.

(3) ABNORMAL HEAD SIZE / MENINGOMYELOCELE: impact of microcephaly and hydrocephalus on child health, types and management of hydrocephalus, relationship between hydrocephalus and Spinabifida, effects of neural tube defect on other parts of the body.

(4) CHILD WITH DISABILITIES (CEREBRAL PALSY): conditions causing longstanding disability, features in the history and examination which describe different types of CP, impact of longstanding disability on the child and family, principles of investigation, management option and support available to the child and family (including the roles of the multidisciplinary team).

(5) NEUROMUSCULAR DISORDERS: Classification of muscular and peripheral neuromuscular disorders, clinical feature and characteristic of these disorders, role of investigations in differentiating these disorders, general management of these disorders.

X. METABOLIC DISORDER

(1) INBORN ERRORS OF METABOLISM (IEMs): Classification of IEMs with a common or important examples Phenylketonuria (PKU) & Tyrosinemia & Galactosemia& Gaucher

disease& Mucopolysacharidosis type I& Glycogen storage disease, characteristic feature of each group (clinical / laboratory), first line investigations and interpretation of their results, general management options, impact of IEMs on the child and the family.
(2)HYPOGLYCEMIA: Definition of hypoglycemia and its pathophysiology, metabolic changes associated with hypoglycemia, features in the history and examination of a child with hypoglycemia, differential diagnosis of hypoglycemia (metabolic and endocrinal), investigation and management plan for hypoglycemia.
(3) MUCOPLYSACCHARIDOSIS: Mode of inheritance, types of MPS , clinical features , radiological finding , diagnosis, management and prognosis.
(4) GLYCOGEN STORAGE DISEASE: Mode of inheritance, types of GSD , clinical features , diagnosis, management and prognosis.

XI. HAEMATOLOGY ANDONCOLOGY

(1) LEUKAEMIA: Pathogenesis and basic classification of leukaemia, modes of presentation of childhood acute leukaemia, differential diagnosis of leukemia, investigations of a child with suspected leukaemia, principles of management acute lymphoblastic leukaemia.
(2) PAEDIATRIC ONCOLOGY / SOLID TUMORS: Common solid tumors (Wilm's, neuroblastoma, lymphoma, brain tumors), modes of presentation of common solid tumors, differential diagnosis for a neck swelling and for an abdominal mass and principles of management.
(3) CHILD WITH PALLOR (ANEMIA): Common types (nutritional, haemolytic and aplastic) of anemia, types of nutritional anemia, clinical features&diagnosis and treatment of iron deficiency anemia.
(4) DIFFERENTIAL DIAGNOSIS IN A CHILD WITH BLEEDING/ BRUISES: Common causes of easy bleeding in childhood, key features in history and physical examination, interpretation of results of first line investigations (CBC& coagulation screen), general management approach to the child with bleeding, indications of blood & blood products transfusion & their complications.

XII. ENDOCRINE DISORDERS

(1) CHILDHOOD DIABETES MELLITUS (DM): Pathogenesis, epidemiology, types , inheritance and related diseases of DM, relevant features of history and clinical examination in DM, diagnostic investigations of DM, complications of DM, control and long term management of childhood DM.
(2) CONGENITAL ADRENAL HYPERPLASIA (CAH): The function of the adrenal gland and its important hormones, common enzyme deficiencies causing CAH, clinical features of CAH, investigations and treatment.
(3) THYROID GLAND DISORDERS:- The function of the thyroid hormones, the features of hypo- and hyperthyroidism (compare both), the interpretation of the thyroid function

test, the management of congenital hypothyroidism, the importance of neonatal screening.
(4) CHILD PRESENTED WITH POLYURIA & POLYDESIA: Definition of polyuria and polydipsia causes of polyuria and polydipsia (focus on psychogenic polydepsia and diabetes insipidus (DI), the relevant clinical features (especially history), outlining the investigation plan, the management of psychogenic polydepsia and diabetes insipidus (DI).
(5) AMBIGUOUS GENETALIA: Causes of ambiguous genitalia, pathogenesis and inheritance of AGS, features of history and clinical examination seen in AGS., diagnostic investigations of AGS and management plan of a baby with suspected AGS
(6) ADRENAL INSUFFEICICY: The common causes for hypoadrenalism, the clinical features of Addison's disease, the management of Addison's disease.
(7) PARATHYROID GLAND DISORDERS (with special reference to calcium disorders): Parathyroid gland function and calcium homeostasis, parathyroid gland disorders, causes of hypocalcaemia, features in history and examination relevant to hypocalcaemia (convulsions / carpopedal spasm), management plan for a child with hypocalcaemia
(8) DIABETIC KETOACIDOSIS (DKA): Definition of DKA, common precipitants of DKA, features of the typical case of DKA, management steps of DKA, the complications of DKA, hyperosmolar diabetic state.

XIII. NEPHROLOGY

(1) NEPHROTIC SYNDROME (NS): Definition of proteinuria, heavy proteinuria and NS, causes of proteinuria, investigations for a child with proteinuria, clinical features of NS, differentiation between NS and nephritic syndromes, principles of management of NS, prognostic factors and indications for Renal Biopsy.
(2) CHRONIC KIDNEY DISEASE (CKD): Definition of CKD, common causes in children, clinical manifestations and complications of CKD, general management plan for CKD.
(3) A CHILD WITH RED URINE: Definition of hematuria causes of red urine, definition of acute nephritic syndrome (ANS) and post streptococcal, acute glomerulonephritis (AGN), typical presentation of ANS, principles of management of ANS.
(4) ACUTE RENAL INJURY (ARI): Definition of ARI, causes of ARI in children (pre-renal, renal, post-renal), main clinical manifestations and complications of ARI, principles of management of ARI (including indications for dialysis).
(5) URINARY TRACT INFECTION (UTI): Epidemiology and risk factors for UTI, features in history and examination (age related) (& upper & lower UTI), relevant investigations (age groups related), significance of pyuria & bacteriuria, management of UTI, complications of renal scaring.

XIV. GENETICS

(1) GENETICS DISEASES& FAMILY COUNSLING: Classification of genetic diseases (chromosomal, AR, AD, X-Linked, multifactorial) , identification of dysmorphic features, the contribution of the clinical geneticists , common congenital anomalies and their impact, family counseling .

(2) THE ODD-LOOKING (DYSMORPHIC) CHILD / DOWN'S SYNDROME /TURNER SYNDROME: Approach dysmorphic newborn & reach the diagnosis of common syndromes using a patient with Down syndrome and turner syndrome, differentiate between normal karyotyping and the Karyotyping of Down syndrome and turner syndrome.

(3) HOW TO READ KARYOTYPING: Karyotyping definition, relevant indication for Karyotyping, the normal human Karyotyping, the disorders that can be detected by Karyotyping (e.g. Down syndrome & Turner syndrome).

XV INFECTIOUS DISEASES AND PREVINTIVE PEDIATRICS:

(1) CHILDHOOD PREVENTION BY LIBYAN EXPANDED PROGRAM OF IMMUNIZATION (EPI):- The principles of immunization (passive and active), Libyan national immunization program (LNIP), common side effects of immunization, some specific indications for additional vaccines, contraindication and the route of vaccination.

(2) CONGENITAL IMMUNE DEFICIENCY (ID): Components of the immune system, congenital immune diseases, clinical situation where immune deficiency is suspected, infections highly characteristic of ID and its management plan.

(3) TUBERCULOSIS (TB): The epidemiology of TB in children, clinical features suggestive of TB, common forms of TB (pulmonary, miliary, meningitis), relevant investigations and principles of management of TB.

(4) HIV IN CHILDREN (other causes of acquired ID): Causes of acquired immune deficiency in children, epidemiology and transmission of HIV (including mother-to-child), clinical situation where immune deficiency is suspected, infections highly characteristic of HIV infection, diagnostic investigations, general management plan of HIV infection and neonates of HIV positive Mothers.

(5) COVID-19 and MIS-C IN CHILDREN: Epidemiologic impacts of COVID- 19 on the pediatric population, critical care considerations for Multisystem Inflammatory Syndrome in Children. (MIS-C), mental health emergencies during COVID-19 pandemic.

(6) VIRAL HEPATITIS: Classification of types viral hepatitis, methods of transmission and the risk factors for different types, epidemiology and clinical features of different types, management plan for different types, complications of viral hepatitis

(7) SPESIFIC BACTERIAL INFECTION (TYPHOID FEVER)

The epidemiology of typhoid fever, clinical features , diagnosis and management.

(8) PROTOZOAL INFECTIONS: Epidemiology, typical clinical **features, investigations** management and prognosis of common protozoal infections in children (Amebiasis& Giardiasis& Malaria& Leishmania).

XVI. EMERGENCIES

(1) THE YOUNG PERSON WITH POISONING / SELF HARM: Approach acutely poisoned child, understanding self-harm& accidental poisoning, identifying predisposing factor, incidence, classical clinical manifestations, management and prognosis of poisonings like(Organophosphorus & Hydrocarbons & Iron & carbon monoxide poisoning& corrosive (alkaline and acid) & Paracetamol and aspirin.

(2) THE SHOCKED CHILD: The basic mechanism of shock in infants and young children, common causes / types of shock, features of the clinical examination to detect early shock, investigations and management of shock.

(3)ANAPHYLAXIS: Definition and common causes of anaphylaxis, clinical presentation and management d of anaphylaxis, measures to avoid recurrence.

(4) OUTLNE OF MANAGEMENT OF POISINING:

Common agents causing poising in children, poison identification, resuscitation and supportive management, methods preventing absorption of poisoning agents and its indication or contraindication, methods of enhancing excretion if possible, laboratory investigations , monitoring and further management.

XVII. SOCIAL & BEHAVIOR

(1) CHILD WITH NEURODEVELOPMENTAL DISORDERS : Definition of common behavioral difficulties [ADHD, autism, school refusal, nocturnal enuresis, encorporesis, sleep disorders, recurrent pain syndrome, characteristic classical clinical manifestations, general management for these disorders.

(2) NON-ACCIDENTAL INJURY- NAI(Child abuse): Types of child abuse, prevalence of NAI, risk factors associated with NAI, features in the history and examination suggestive of NAI, investigations for a baby with NAI and measures to prevent NAI.

XVIII.PEDIATRIC RADIOLOGY

Objective: To describe most common aspects in Pediatric radiology:

(1) Chest radiology: Read and comment on normal chest X ray (cardiac & respiratory), describe positive findings on Chest X-rays (various abnormalities like cardiomegaly, dextrocardia, congenital heart disease & lung consolidations, foreign body aspiration, pleural effusion& pneumothorax.

(2) Other pediatric radiology: X-ray of the wrist (Rickets), Maturating cystourethrogram (MCUG), Plain abdominal X-ray (e.g. obstruction, double bubble), X-rays with bone fracture and gastrograffin swallows (GOR).

I I - CLINICAL SESSIONS: -

1 **-BED SIDE TEACHING: By Teaching Staffs**

2- CASE BASED DISCUSSION: By students and supervised by tutors

CASE BASED DISCUSION

1. Obesity. 2. D/D of SS. 3.Febrile child. 4.Small for gestational age.
5.Birth trauma and cold injury. 6. Congenital hip dislocation DDH.
7. Benign neonatal conditions 8. Neonatal Bleeding.
9. Rickets.
10. Foreign body aspiration 11.Whooping cough. 12. Henoch Sholein Purpura.
13. Infective endocarditis. 14.Kawasaki disease.
15. GERD. 16. Inflammatory bowel disease. 17. Abdominal pain. 18. Food allergy
19. GIT bleeding. 20. Chronic diarrhea 21. Floppy infant. 22. Acute weakness
23. Headache. 24. Tyrosinemia. 25. Iron deficiency anemia. 26.Hemophilia.
27. Idiopathic thrombocytopenic Purpura.
28. Approach to hypoglycemia in diabetic child.
29. Approach to hyperglycemia in diabetic child. 30. Nocturnal enuresis
31. Renal tubular acidosis. 32. Fragile X syndrome 33. Tropical infections.
34. Toxic shock syndrome. 35. Pyrexia of unknown origin.
36. Common viral infections(Herps simplex, measles, mumps, parvovirus, rubella).
37. Organophosphorous poisoning 38. Iron poisoning. 39. Paracetamol poisoning
40. Child physical abuse.

III- SKILL LAB: AT THE FACULTY

Divided into four parts:-

I-Respiratory Skills

- Auscultation training of lung.
- Delivery of Medications via Nebulizer and MDI& Oxygen delivery methods.
- Basic respiratory function tests PFM**.**

II-Cardiovascular Skills

- Auscultation training of heart sounds
- Interpreting the 12- leads ECG By using Mannequin.
- Scenario SVT

III-Pediatric Emergency Skills

- Newborn resuscitation.
- Septic Shock
- Scenario management of Acute Asthma.
- Scenario management of status epilepticus.
- Foreign body aspiration.

- Advanced Pediatric life support.

IV-Monitoring and Therapeutic Skills

- Interpret of blood gases
- Setting up an infusion; use of infusion devices, type of IV fluids, normal fluid & electrolytes requirement.
- Taking blood cultures& Blood sampling.
- NGT insertion.
- Intradermal injection.
- Urine collection samples.
- Intraosseous insertion.
- Lumber puncture.

TEACHING & LEARNING METHODS

- Lectures
- Tutorial
- Group discussion & case studies
- Bedside teaching and demonstration: training in small groups.
- Skill lab

ASSESSMENT METHODS:

Allocated Marks: - 200 Marks In the Form of:-
1. Pre- Final Test: -
Midterm exam: 15 mark (7.5 marks for focused history- 7.5 marks for clinical examination).
Case based discussions:5 marks.
Attendance:10 mark.

2. Final Examinations: -
Written exam:70 Mark. (MCQ, Data Interpretation, Case Scenarios).
Clinical exam (OSCE):100 Marks.

LIST OF REFERENCE:-

I-REFERENCES FOR THE TEACHING STAFF: FOR LECTURES AND TUTORIAL

- Nelson text book of pediatrics. 19 edition, 2011 by Kliegman RM et al (the newedition 20, 2015 is available in 2 volumes).
- Pediatric Decision –making Strategies.. 2nd edition, 2016 by Promeranz. A.J etal.

- Practical strategies in pediatric diagnosis and therapy. 2nd edition , 2004 by Kliegman RM etal (available on line) .

II- REFERENCES FOR THE STUDENTS:

- Nelson Essential of Pediatrics.
- Illustrated Textbook of Pediatrics.
- Core Pediatrics: A problem-Solving Approach.

FOURTH CLINICAL SEMESTER/ MEDICINE \ (MD512)

BASIC INFORMATION

Title	**Medicine**
Code	MD512
Units	12 units -26 hours /week
Duration	18 weeks
Prerequisites:	All basic non-clinical courses

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:-

1. Understand the different diseases in all systems of the body, in relation to internal Medicine, in the light of knowledge already acquired in Anatomy, Pathology, physiology, microbiology &pharmacology.
2. Acquire competent knowledge and skills in obtaining comprehensive problems – oriented history, performing complete physical examinations, and demonstrating problem-solving skills in pathophysiologic derangements to specific disease entities.
3. Introduce students with appropriate knowledge and practical to suggest the proper line of investigations to reach a diagnosis after enlisting relevant differential diagnoses.
4. Discuss a plan of management including the most appropriate prescribed medications, their pharmacology, indications, dosage, side effects, and toxic effects.
5. Recognize the complications associated with the disease process.
6. Introduce the student with basic knowledge to recognize the time and need for consultations with the appropriate specialists.
7. Analyze different factors, internal, external, familial, environmental, seasonal, and endemic, to plan prevention as well as eradication measures.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the most common diseases in general medicine.
2. Describe differential diagnoses of common diseases.

3. Describe the most important laboratory diagnostic tests and other investigations to diagnose common diseases.
4. Describe amanagement plan for common diseases.
5. Identify a basic knowledge of disease prevention and eradication.
6. Describe the most important psychiatric diseases and their management.
7. Describe the most common dermatological diseases.
8. Describe the most important steps to manage dermatological disease.
9. Describe the most common emergencies in medicine and their management plan.

B.INTELLECTUAL SKILLS

1. Discuss the most common diseases in general medicine by interpreting the most important symptoms and signs of common diseases.
2. Interprets patient's data in an organized and informative manner, makes a differential diagnosis, and ability to do single diagnosis and exclude other differential diagnoses.
3. Discuss the most important laboratory diagnostic tests to set up a priority-based action plan for common diseases.
4. Formulate a management plan for common diseases.
5. Analyze different factors that help in the prevention of diseases as well as eradication measures.
6. Discuss the causes, clinical symptoms, signs, and management plan for the most important psychiatric diseases.
7. Discuss the clinical presentation of the most common dermatological diseases.
8. Analyze management plans for the most common dermatological diseases.
9. Discuss emergency and critical conditions and formulate appropriate management plans for an individual patient.

C.PRACTICAL AND CLINICAL SKILLS

1. Record and present good detailed history for patients presenting with common diseases.
2. Practice an adequate general and systemic examination, for patients presented with common diseases.
3. Perform the most important procedures, laboratory diagnostic tests, and other investigations including ABG, NGT insertion, x-ray, ECG, CT scan, and MRI to set up a priority- based action plan of common diseases.
4. Practice plane management for common diseases in medicine
5. Prepare aprevention plan for diseases as well as eradication measures.

6. Discover the causes, clinical presentations of most important psychiatric diseases and practice management plan.
7. Conduct a clinical assessment of the most common dermatological diseases.
8. Practice management plans for the most common dermatological diseases.
9. Apply diagnosis and demonstrate competently action plans and basic life support of emergency and critical conditions on manikins, and practice appropriate management plans for individual patient.

D.GENERAL AND TRANSFERABLE SKILLS

1. Respect the patients, colleagues and any other members of the health profession.
2. Possess the ability to give presentations.
3. Present medical information in written and oral forms.
4. The ability to work effectively with others on a common task.
5. Possess the ability to use a computer to search for information related to the course.
6. Self- learning ability.
7. Manage time effectively.
8. Practice self and peer evaluation.

COURSE CONTENT:

GENERAL MEDICINE

CARDIOVASCULAR SYSTEM

LECTURES

- Rheumatic heart disease
- Coronary heart disease
- Arrhythmias
- Cardiomyopathy
- Infective endocarditis
- Heart failure
- Pericardial diseases

CASE SCENARIO &TUTORIAL

- Patient with syncope
- Patient with chest pain
- CPR
- CARDIOGENIC SHOCK
- D/D of lower limb edema

- Cardiac murmurs
- Patient with dyspnea
- Hyper tension
- Patient with palpitation
- Patient with PND and orthopnea
- ECG 1
- ECG2
- ECG3
- ECG4

GASTROENTEROLOGY &HEPATOLOGY

LECTURES

- Inflammatory Bowel diseases
- Small bowel diseases
- GIT bleeding
- Liver cirrhosis
- Peptic ulcer disease
- Esophageal diseases
- Pancreatitis
- Hepatitis

CASE SCENARIO &TUTORIAL

- Patient with nausea& vomiting
- patient with abdominal pain
- Jaundice
- bloody diarrhea
- constipation
- patient with dysphagia
- patient with dyspepsia
- Hematemesis
- Melena
- patient with anemia&diarrhea(Malabsorption)

NEUROLOGY

LECTURES

- Multiple sclerosis
- Parkinson disease and extra pyramidal disorders
- C.V.A, Epilepsy and brain tumors

CASE SCENARIO &TUTORIAL

- Localization of CNS Lesions
- gait disorders
- patient with headache

INFECTIOUS DISEASES

LECTURES

- HIV -
- HIV-II
- Extra pulmonary TB
- CNS infection

CASE SCENARIO &TUTORIAL

- Pyrexia of unknown origin

RESPIRATORY SYSTEM

LECTURES

- Bronchial asthma
- Chronic obstructive lung diseases
- Pneumonia
- Tuberculosis
- Interstitial lung diseases
- Bronchogenic carcinoma
- Pleural diseases
- Pulmonary function test

CASE SCENARIO AND TUTORIAL

- Patient with chest pain
- Patient with hemoptysis
- Patient with chronic cough
- Patient with acute cough and fever
- Patient with wheeze
- Patient with dyspnea
- Patient with sleep/ breathing problem
- ABG

ENDOCRINE SYSTEM AND METABOLISM

LECTURES

- Introduction to DM
- DM diagnosis and management
- DM chronic complication

- Thyroid diseases
- Sheehan's syndrome and other hypopituitary disorders
- Acromegaly and other pituitary tumors
- Adrenal disorders
- Dyslipidemias

CASE SCENARIO AND TUTORIAL

- Approach to patient with neck swelling
- Polyuria and polydipsia
- Patient with decreased appetite and weight gain
- Patient with increased appetite and weight loss
- Obesity (D/D of endocrine disorders)
- Patient with symptoms of hypoglycemia

RHEUMATOLOGY

LECTURES

- Systemic lupus erythematosus
- Rheumatoid arthritis
- Systemic sclerosis
- Inflammatory muscle diseases
- Vasculitis syndromes

CASE SCENARIO AND TUTORIAL

- Approach to painful joints
- D/D of recurrent oral ulcers
- D/D of crystal induced arthropathy
- Biological treatment (immunological base)

NEPHROLOGY

LECTURES

- Acute kidney injury
- Chronic renal failure
- Secondary hypertension (renal causes)
- Glomerulonephritis and nephrotic syndrome

CASE SCENARIO AND TUTORIAL

- Anuria and oliguria
- Approach to hematuria, proteinuria and renal function

HEMATOLOGY

LECTURES

- Anemia
- Leukemia and lymphoma
- Plasma cell disorders
- Bleeding disorders

CASE SCENARIO AND TUTORIAL

- Patient with anemia
- Patient with lymphadenopathy
- Patient with bleeding tendency
- Interpretation of CBC
- Blood transfusion

SPECIAL MEDICINE

LABORATORY DIAGNOSTIC MEDICINE

LECTURES

- Acid- base balance
- Mineral metabolism
- Toxicology
- Cellular hematology
- Body fluid analysis
- Tumor markers
- Endocrine test I (thyroid + parathyroid)
- Endocrine Test II(pituitary + Adrenal)

TUTORIALS

- C.S.F analysis
- Coagulation tests
- Immunological serology
- Blood gases(ABG)
- Urinalysis
- Stool analysis
- CBC and Acute reacting substances
- Peripheral Blood film
- L.F.T
- Renal function test
- Synovial fluid analysis

PSYCHIATRY

LECTURES

- Introduction and term definitions
- Schizophrenia &related disorders
- Delusional diseases
- Affective disorders
- Neurosis disorders
- Personality disorders
- Somatoform disorders
- Mental disorders due to general medical conditions
- Organic syndromes
- Disorders of eating, sleeping & psychosexual function
- Substance related disorders
- Treatment in psychiatry

TUTORIAL

- History
- Examination
- History of psychosomatics
- Psychosomatics disorders
- Treatment of psychosomatics disorders
- S/E of psychiatric drugs

CASE SCENARIO OF COMMON PSYCHIATRIC DISEASE:

- Mania
- Depression
- Anxiety neurosis
- Schizophrenia

DERMATOLOGY&VENEREOLOGY

LECTURES

- Function & structure of normal skin
- Bacterial skin diseases
- Fungal skin diseases
- Viral skin diseases
- Facial dermatosis (Acne, Rosacea)
- Mycobacterial skin disease (T.B & leprosy)
- Autoimmune vesiculo- bullous disease
- Ecto-parasite skin infection diseases
- Skin tumors

- Geno – Dermatosis
- Skin manifestation of sexually transmitted disease
- Syphilis
- HIV
- Psoriasis

TUTORIAL

- History and examination
- D/D of alopecia (primary & secondary)
- D/D of hyper pigmentation
- D/D of papulo- squamous disease
- Types of eczema
- Urticaria
- Erythema, EN, EM& sweat disease
- The cutaneous manifestation of C.T.D(SLE&Dermatomyositis)
- Cutaneous manifestation of scleroderma
- Discoid lupus erythematosus
- Candidiasis
- Management of lichen planus
- D/Dof hypopigmentation
- Leishmaniosistypes &management
- Nail disorders (deferential diagnosis)
- Cutaneous manifestations of granulomatous diseases

EMERGENCYMEDICINE

LECTURES

- DKA
- Hyperosmolar diabetic coma
- GIT bleeding
- Shock
- Drugs and substance poisoning
- Hypoglycemia
- Adrenal crisis
- Status asthmaticus
- Hepatic failure
- Status epilepticus
- Acid – Base and electrolytic disturbance
- Cardiopulmonary resuscitation

TUTORIAL

- D/D of coma
- D/D of acute chest pain
- Medical causes pf acute abnormal pain
- Use of Seng-Staken tube
- Endotrachealintubation (indication & mechanism of insertion)
- Ventilators (types & indication of use)
- Hypothyroidism (myxedema coma)
- Thyroid storm
- Hypothermia
- Causes of hypotension
- Pulmonary hemorrhage
- Acute pulmonary edema`
- Septicemia and septic shock
- Sclerotherapy (definition &indication)
- Pacemaker(insertion in Emergency)
- Treatment of arrhythmias in ICU
- Central venous line and monitoring of CVP.
- NG tubes (uses in emergency situations).

MEDICAL SKILLS LAB

- Respiratory system examination
- Cardiovascular system examination
- Abdominal examination
- Central nervous system examination
- Rheumatology skill lab
- Medical emergency skills
- Monitoring and therapeutic skills.

TEACHING & LEARNING METHODS:

- Lectures
- Tutorials (group discussion &case studies)
- Bedside teaching and demonstration: training in small groups.
- Practicle in skill lab.

ASSESSMENT METHODS:

Allocated Marks: - 300 Marks

Final Examinations:

- Written exam (paper one): 60 Marks.

- Written exam (paper two): 60 Marks.
- Clinical Examination: 100 Marks
  (Including 3 short cases (75 marks) and dermatology assessment station (25 marks).
- Oral exam (Diagnostic): 40 marks
- History taking skills: 40 marks

LIST OF REFERENCES:

1. Davidson's Principles and Practice of Medicine
2. Macleod's Clinical Examination.

FIFTH CLINICAL SEMESTER/ SURGERY (SG512)

BASIC INFORMATION

Title	**Surgery**
Code	SG512
Units	12units –33 hours/week
Duration	18 weeks
Prerequisites:	All basicnonclinicalcourses

OBJECTIVES OF THE COURSE:

By the end of the course, the student will be able to:-

1. Recognize the common surgical conditions and surgical emergencies, their etiology, epidemiology, clinical presentation assessment, diagnosis, management, and complications.
2. Acquire the necessary professional and ethical skills for the practice of surgery.
3. Communicate effectively with patients, their relatives, colleagues, and the rest of the medical team.
4. Practice patient-centered care with the involvement of patients in decisions about their treatment and care.
5. Practice problem-solving approach and evidence-based medicine.
6. Keep the patient's safety and well being his first concern.
7. Understand the principles of preoperative preparation and postoperative care.
8. Carry out basic surgical interventions and basic life support.
9. Recognize the effect of diseases on patients, families, and society, and the role of surgery in life-saving, treatment of diseases, and amelioration of suffering.
10. Learn the importance of health promotion, disease prevention, early detection, and screening of diseases.
11. Acquire the competencies in self and long life learning, self -development, and team work.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Understand the principles of surgical care, patient safety, patient -centered care, and team work, evidence -based practice, consent, and medico legal aspects of surgical care.
2. Understand the principles of surgical practice and how to use them in day to day care of surgical patients.
3. Identify the epidemiology, causes, and burden of injuries, and describe the triage, resuscitation, management of multiple injured patients, and management of injuries of different regions and organs of the body.
4. Define the pathogenesis, epidemiology, presentations, examination, differential diagnosis, investigation, treatment, complications , follow -up, and palliative care of common conditions in general surgery, orthopedics, urology, ENT, neurosurgery, burns and reconstructive surgery, pediatric surgery, thoracic surgery.
5. Identify the causes, clinical manifestations, diagnosis, treatment, and complications of common surgical emergencies in all surgical specialties.
6. Identify the common laboratory investigations, diagnostic imaging and basic instruments, and devices used in surgical care.
7. Recognize the types of anesthesia, drugs used in anesthesia, oxygen therapy, care of the airway, ventilation, care of the critically patients, safety and complications of anesthesia.
8. Recognize the life threatening conditions and critically ill patients and the life-saving measures and interventions for these conditions.
9. Define the methods and ways of screening and early detection of cancers and other diseases.

B.INTELLECTUAL SKILLS

1. Relate the principles of surgery and biomedical sciences to the diagnosis, management and prevention of surgical conditions.
2. Interpret the common and important symptoms, and signs of common general surgical conditions, and surgical subspecialties.
3. Interpret the symptoms, and signs of surgical emergencies.
4. Differentiate between different surgical conditions.
5. Correlate the aspects of patient safety and risks on patients
6. Formulate anappropriate management plan for common surgical conditions

7. Plan preoperative preparation, type of anesthesia and postoperative care for common surgical conditions
8. Interpret the common investigation results used for surgical patients, and select the appropriate instruments and devices used for common surgical conditions.
9. Differentiate critically ill patients and life threatening conditions and select the appropriate life saving measures.

C.PRACTICAL AND CLINICAL SKILLS

1. Apply the biomedical sciences and principles of surgery in day to day care of surgical patients.
2. Use the ethical and professional standards in the practice of surgery, and apply the guidelines of patient safety at all stages of surgical care.
3. Take an informed consent and document it according to the medicolegal standards
4. Obtain and record a detailed, comprehensive history and document it clearly for patients presenting with surgical problems.
5. Carry out and record a complete general and systemic examination in general surgery and surgical subspecialties.
6. Perform preoperative assessment and optimize the patient for the type of surgery and anesthesia, andperform post-operative care and observation clinically and by the use of monitoring devices.
7. Obtain focused history for surgical emergencies and injured patients, and perform anassessment of these patients.
8. Order the common laboratory and imaging investigations with consideration to relevance and cost, and able to identify normal and abnormal results and findings, and perform basic interventions needed in day to day care of surgical patients.
9. Identify and provide care to the critically ill patients, carry out life support measures, and cardiopulmonary resuscitation.

D.GENERAL AND TRANSFERABLE SKILLS

1. Behave ethically and professionally.
2. Work effectively within a team with an understanding of the team dynamics and spirit.
3. Show respect to patients, and their relatives and maintain their dignity, integrity, and confidentiality.
4. Communicate well with patients, colleague's andthe rest of the medical and non-medical teams.

5. Manage time effectively and appreciate the value of time in medical care.
6. Motivate and teach colleagues and the rest of the team.
7. Present information and data in all available forms.
8. Develop analytical and problem- solving skills.
9. Practice self-evaluation and improvement and acquire lifelong learning and professional development.

COURSE CONTENT

LECTURES

- Course introduction, principles of surgical care, patient centered care, patient safety, team work and evidence based practice.
- Role of surgery in life saving, treatment of disease, amelioration of suffering ,health promotion screening, early detection and prevention of disease
- Medical ethics, professional standards, the consent process and medical documentation.
- Wounds, wound healing, management of wounds.
- Fluids and electrolytes in surgical patients
- Hemostasis types of hemorrhage, blood and blood products in surgery.
- Shock, types, pathophysiology and management of shock.
- Septic shock and sepsis syndrome.
- Metabolic response to surgery and injury.
- Nutritional support in surgical patients
- Surgical infections I :health care associated infections(HAI), surgical site infections, use and misuse of antibiotics
- Surgical infections II: skin infections, gas gangrene, tetanus, synergestic gangrene.
- Surgical infections III: specificinfections, TB, leprosy, syphilis hydatiddisease, parasitic infections of surgical importance.
- Sterilization and disinfection ,use of antiseptics
- Preoperative preparation and post operative complications.
- Principles of surgical oncology, epidemiology ,causes ,grading , staging, tumor markers, diagnosis ,treatment ,follow up ,,prognosis ,precancerous conditions , early detection, screening and prevention.
- Venous thromboembolism, DVT and pulmonary embolism.
- Palliative care.
- Organ transplantation.
- Trauma, epidemiology,causes, burden of trauma, disaster, war surgery and triage.
- Management of patients with multiple traumas.

- Abdominal injuries.
- Chest injuries.
- Vascular injuries and compartment syndrome
- Head injuries.
- Spinal injuries.
- Principles of fractures and dislocations, causes, types, diagnosis and complications.
- Principles of fracture treatment.
- Burns
- Salivary gland diseases.
- Neck swellings and conditions.
- Thyroid, benign diseases of thyroid.
- Thyroid, solitary nodule, thyroid malignancies.
- Parathyroid diseases and disorders of calcium metabolism.
- Diseases of adrenal gland, neuroendocrine tumors, MENI&MENII.
- Benign diseases of the breast and male breast.
- Carcinoma breast and other malignant breast conditions.
- Diseases of the venous system, varicoseveins, post phlebtic leg and congenital anomalies of venous system.
- Chronic limb ischemia.
- Acute limb ischemia, criticalischemia, gangrene and compartment syndrome.
- Vascular aneurysms.
- Foot ulceration and diabetic foot disease.
- Thoracic outlet syndrome and vasospastic conditions of the limbs.
- Diseases of the lymphatic system, lymphadenopathy, lymphedema, and DD of unilateral leg swelling.
- Benign diseases of esophagus, injuries, perforation, neuromuscular disorders, diverdiculae, hiatus hernia.
- Benign and malignant tumors of esophagus.

- Benign diseases of stomach and duodenum.
- Gastric carcinoma ,duodenal tumors
- Gall bladder anatomy, diseases.
- Obstructive jaundice.
- liver ,anatomy , infections , cysts and benign tumors
- liver tumors, tumors of gall bladder and biliary tree
- Portal hypertension .acute upper GIT bleeding.
- Diseases of the pancreas, acute pancreaitis, chronic pancreatitis, pancreatic cysts.
- Carcinoma of pancreas, endocrine tumors of the pancreas.
- Diseases of the spleen, spleenomegally , indications and complications of spleenectomy.

- Diseases of the small bowel,tumors ,intussusception ,Meckeles diverticulum ,infections of terminal ileum.
- Inflammatory bowel disease.
- Acute appendicitis ,tumors of the appendix
- Diverticular disease of the colon, colonic infections of surgical importance.
- Ischemic colitis, radiation proctitis, IBS, polyps of colon and rectum.
- Intestinal obstruction.
- Colorectal carcinoma and premalignant conditions of colorectal carcinoma.
- Anal canal anatomy and physiology , perianal conditions ,piles ,fissure and ulceration
- Peri anal infections, abscess, fistula and pilonidal sinus .
- Rectal prolapse, fecal incontinence, and pelvic dysfunction syndrome.
- Anal carcinoma and warts.
- Peritonitis and intraperitoneal sepsis.
- Intestinal ischemia.
- Lower GIT bleeding.
- Intestinal stomas and fistulas.
- Diseases of the mesentery, omentum and retroperitoneum.
- Abdominal wall hernias and diseases of the umbilicus.
- Principles of bariatric surgery.
- Management of abdominal masses in infancy and childhood.
- Tracheo_esophageal fistula, congenital pyloric stenosis.
- Intestinal obstruction in infancy and childhood.
- Anorectal anomalies, congenital megacolon and constipation in children.
- Surgical emergencies in infancy and child hood
- Diseases of the mediastinum, infections, cysts tumors and superior venacaval obstruction.
- Pleural diseases, empyema, chylothorax and tumors of pleura.
- Surgical aspects of carcinoma lung.
- Lung abscess, bronchioectasis, hydatid cyst of lung and tuberculosis of lungs.
- Regional and general anesthesia.
- Lumps of skin and subcutaneous tissue.
- Malignant skin tumors.
- Instruments, surgical photos and x_rays.
- Hematurea, injuries of the urinary tract.
- Urinary obstruction.

GENERAL SURGERY

Salivary glands, Neck, Thyroid, Parathyroid gland, Lymphatic system, Arterial Disorders Venous Disorders, Abdominal wall and hernias, Breast, Stomach and duodenum, Liver Biliary system, Pancreas, Spleen, Peritoneum, momentum, and mesentery, Intestinal obstruction

Appendix, Small and large intestines, anal canal, Minima invasive surgery

TUTORIAL IN GENERAL SURGERY

Management of abdominal injuries, Management of acute abdomen, Management of upper gastro- intestinal bleeding, Management of bleeding per rectum, Management of multiple injured patient, Management of solitary thyroid nodule, Management of a breast lump, Common surgical operation, Common surgical instruments and tubings.

ORTHOPAEDIC SURGERY

- Introduction to fractures and dislocations and principles of treatment
- Fracture complications and their management
- Fractures and dislocations around shoulder fracture and arm
- Fractures and dislocations around elbow and forearm
- Fractures and dislocations around wrist and hand
- Fractures and dislocations around pelvis and hip
- Fractures of the femur
- Fractures and dislocations around knee
- Fractures and dislocations around the leg, ankle and foot
- Principles of treatment of orthopaedic disorders
- Bone tumours
- Bone and joint infection
- Congenital anomalies of bones and joints
- Biomechanics & mechanical disorders
- Metabolic and generalized bone diseases
- Non-infective arthritis
- Neurological disorders affecting musculoskeletal system
- Spinal deformities and low back pain

TUTORIAL IN ORTHOPAEDIC

- Introduction to Orthipaedic patient
- Disorder of the shoulder
- Disorders of the elbow
- Disorders of wrist and hand
- Disorders of the hip
- Disorder of the knee
- Disorder of the foot

BURNS AND RECONSTRUCTIVE SURGERY

- Burns
- Management of Facial Injuries
- Reconstructive Surgery
- Reconstructive Surgery
- Surgical lesions of the skin
- Cleft Lip and Palate
- Thoracic trauma
- Mediastinum
- Oesophagus disease
- Lung Cancer
- Thoracic cage, pleural diseases, Spontaneous pneumothorax, & bullous disorders
- Thoracic infections & parasite infestation
- Pleural diseases in general
- Surgical aspect of heart diseases (pericardium& great vessels)

NEUROSURGERY

- Head injury
- Spinal injury
- Hydrocephalus
- Brain tumor WHO classification
- Spinal tumors classification
- Subarachnoid heamorrhage (SAH)
- Developmental anomalies

UROGENITAL SURGERY

- Urinary tract infection
- Injury of genitourinary tract
- Benign prostatic hyperplasia
- Urolithiasis
- Congenital anomalies
- Renal tumours
- Urothelial tumour
- Cancer prostate & testicular tumours

PAEDIATRIC SURGERY

- Neo-natal intestine obstruction & intussusceptions in children
- Anorectal anomalies & congenitalmega – colon (Hirchsprung disease)
- Neo-natal respiratory distress -surgical causes

- Malignant solid tumours in children

TUTORIAL IN PAEDIATRIC SURGERY

- Hernia and hydrocele in children
- Undescended testis
- Pyloric stenosis
- Acute abdomen in children
- Neck swelling in children

ENT SURGERY

- Conditions of external ear (pinna, & external canal & meatus)
- Conditions of middle ear
- Condition of inner ear
- Benign nasal conditions
- Epistaxix
- Nasal trauma
- Tumour of nose & para-nasal sinuses
- Lymphoid tissue (tonsils&adenoids)
- Abscesses (peritonsillar, parapharyngeal, retropharyngeal)
- Conditions of larynx
- Tumours of larynx, hypopharyns&oropharyns
- Air way problems
- Congenital anomalies in otolaryngology
- Facial nerve paralysis
- Miscellaneous topics

TUTORIAL IN ENT

- Ear & hearing (introduction)
- Nose & para-nasal sinuses (introduction)
- Oropharynx, Hypopharynx, Nasopharynx, & larynx &tracheo-bronchial tree (introduction)

ANAESTHESIA

- Pre-operative assessment
- Inhalational anaesthetic agents
- Intravenous anaesthetic agents
- Neuromuscular blockade (muscle relaxants)
- Laryngoscopy & endotracheal intubation (ETI)
- Complications of G.A
- Regional anaesthesia

- Shock
- Cardiopulmonary resuscitation (CPR)
- Analgesia & pain control
- Life support

TEACHING & LEARNING METHODS

- Lectures
- Tutorials (group discussion &case studies)
- Bedside teaching and demonstration: training in small groups.
- Practicle in skill lab.

ASSESSMENT METODS:

Allocated Marks: 300 Marks
Pre- Final Test: 40 marks
- **Final Examinations:-**
- Written Examination: 50 Marks. .
-Problem solving: 50 marks
- OSCE: 160 Marks.

LIST OF REFERENCES:

1. Principles and practice of surgery by. O. James Garden..Andre. W. Bradbury.... John. L.
   Forsyth. 6 th Edition
2. Baily, s and Love, s... Short practice of surgery.By Norman. S. Williams.... Christopher
   Bulstrod.... P. Ronan. O. Connell.26thEdition
3. Browse lntoduction to the symptoms and signs of surgical disease 4thEdition
4. Adam, s outline of FracturesChurchill Livingstone, David hamblen... Hamish Simpson12thEdition.

RADIOLOGY (RD440)

BASIC INFORMATION

Title	**Radiology**
Code	RD440
Units	4 units- 10 hours/week
Duration	4 weeks
Prerequisites:	All basicnonclinicalcourses

OBJECTIVES OF THE COURSE

By the end of the course, the student will be able to:-

1. Understand the principles of primary health service regarding bio effects of radiation hazards and prevention.
2. Identifiy radiological services in acute emergency and trauma including its medico-legal aspects.
3. Understand imaging's role in diagnosis, treatment, advantages, and disadvantages.
4. Understand the physics of the diagnostic imaging, radiotherapy and nuclear medicine machines.
5. Acquire essential knowledge and skills needed to interact with other specialists to provide the utmost benefit for the patient.

INTENDED LEARNING OUTCOMES

A.KNOWLEDGE AND UNDERSTANDING

1. Describe basic concepts of diagnostic imaging techniques, and their indications and contraindications including the MRI, CT, X RAY, and US.
2. Identify basic concepts of radiology physics, radiation protection, patient safety measures, and risks of contrast media.
3. Determine the most important radiology interventional procedures including their indications and risks involved.
4. Define basic concepts of nuclear medicine and its role in the treatment and follow-up of common clinical conditions including the tumors, should be able to describe the proper cost-effective algorithm of basic imaging techniques in a given problem setting.

5. Describe the management plane of basic concepts of radiotherapy and its role in the treatment of common tumors of different bony organs and identify the basic concept of patient informed consent.

B. INTELLECTUAL SKILLS

1. Discuss diagnostic imaging techniques and their indications and contraindications including the MRI, CT, X RAY, and US and optimally prescribe the most appropriate imaging test in relation to the clinical question.
2. Interpret radiology physics, radiation protection and patient safety measures, and risks of contrast media.
3. Discuss the most important radiology interventional procedures including the indications and risks involved, andthe role of diagnostic imaging techniques in theinvestigation of common clinical conditions including common emergencies.
4. Formulate indication, diagnostic features, and limitations of the application of basic diagnostic imaging of nuclear medicine techniques and should be able to discuss proper cost-effective algorithm of basic imaging techniques in a given problem setting.
5. Give examples of the management plan of radiotherapy and its role in treatment of common tumors of different bony organs and to discuss the basic concept of patient informed consent.

C. PRACTICAL AND CLINICAL SKILLS

1. Conduct adequate diagnostic imaging techniques including the MRI, CT, X RAY, and Us, and practice the normal anatomy of body organs as they appear on imaging.
2. Apply and record radiological information in a report and beable to relate the radiological reports to structures on images using knowledge in radiology physics, radiation protection and patient safety measures, and risks of contrast media.
3. Apply the As Low as Reasonably Achievable (ALARA) principle to the prescription of different radiological methods involving ionizing radiation.
4. Discover unnecessary radiation exposure by choosing the most appropriate imaging test and proper use of nuclear medicine techniques.
5. Prepare a management plan of radiotherapy and its role in treatment of common tumors of different bony organs and apply the basic concept of patient informed consent.

D.GENERAL AND TRANSFERABLE SKILLS

1. Respect the patients, colleagues and any other members of the health profession.
2. Possess the ability to give presentations.
3. The ability to work effectively with others on a common task.
4. Possess the ability to use a computer to search for information related to the course.
5. Self- learning ability and manage time effectively.

COURSE CONTENTS:

1- LECTURES
A- DIAGNOSTIC RADIOLOGY

CENTRAL NERVOUS SYSTEM IMAGING

- Imaging pt. with CVA.
- Cerebral Infarction.
- Brain tumors and metastasis.
- Neurodegenerative diseases.
- Congenital disorders of the brain.
- C.N.S Infection

FACE AND NECK IMAGING

- Disease of the Nose and Sinuses.
- Disease of the Ears.
- Injuries and Diseases of the orbit.
- Disease of the neck

CARDIOVASCULAR AND INTERVENTIONAL RADIOLOGY

- Interventions in vascular disease.
- Tissue biopsies.
- Congenital heart disease.
- Coarcatation of Aorta and Aortic Dissection.
- Imaging of Vascular disease

CHEST RADIOLOGY

- Analysis of chest radiograph.
- Opacities in the Lung.
- Acute Pulmonary changes.
- Chronic Lung disease.

- Lesions in the Mediastinum.
- Enlargement of the Hila.
- Pleural disease

GENITOURINARY TRACT RADIOLOGY

- Renal Ultrasound.
- Renal masses.
- Renal volume loss / Renal atrophy.
- Increase in renal volume.
- Renal calculi.
- Renal congenital anomalies.
- Renal trauma.
- Adrenal tumor

GASTROINTESTINAL RADIOLOGY

- Analysis of Abdominal Radiography.
- Imaging of acute abdomen.
- Disease of Esophagus and Stomach.
- Disease of Liver and Hepatobilliary system.
- Disease of Pancreas and Spleen.
- Disease of Bowel.

BONE AND SOFT TISSUES IMAGING

- Analysis of a bone image.
- Disease of the Bone.
- Disease of the Joints.
- Fracture and Dislocation.
- Soft tissue tumors.
- Imaging of spine disease

Obstetrics and Gynecology Radiology

- Obstetrics Ultrasound.
- Gynecological disease.
- Child pelvic mass

RADIOLOGICAL ANATOMY

- CNS anatomy.
- Chest anatomy.
- GIT and HBS anatomy.

RADIOLOGICAL PHYSICS

- Conventional physics.
- MRI physics.
- CT physics.
- USS and Doppler physics.
- Radiation Protection.

B-RADIOTHERAPY

- CNS Tumors
- GIT Tumors
- Lung Tumors
- Genitourinary Tract and Pediatric tumors
- Head and Neck Tumors

C- NUCLEAR MEDICINE

- Physical principles of nuclear medicine
- Commonly used nuclear medicine procedures (Bone scintigraphy,
- myocardial scintigraphy,
- Renal scintigraphy (dynamic and static), Hepatobilliary scintigraphy,
- Endocrine Scintigraphy

2-TUTORIALS

A-DIAGNOSTIC RADIOLOGY

- MSK Anatomy
- Opacities in the Lung
- Analysis of Chest radiograph
- Analysis of abdominal radiograph
- Imaging Patient with Jaundice and Liver cirrhosis
- Imaging of acute abdomen
- Imaging of intestinal obstruction
- Imaging pediatric abdominal masses
- Imaging pt. with CVA
- Imaging of the brain tumor
- Imaging neck masses
- Imaging of bone tumor
- Imaging of vascular disease

B-RADIOTHERAPY

- Gynecological and breast Tumors
- Principles of Radiotherapy
- Oncological Emergencies andPalliative Radiotherapy
- Management of Cancer patients
- Lymphomas

C-NUCLEAR MEDICINE

- Palliative pain therapy for patients with disseminated bone metastases (e.g. Rhenium-188, Rhenium 186, Strontium-89 and Samarium-153)Emergency nuclear medicine: GIT Bleeding, Lung scintigraphy (ventilation and perfusion).
- Radioimmunoassay,Immunoradiometricassay and schilling testRadiosynoviorthesis (radiationsynevectomy of large, middle and small joints)

- Bone Densitometry (Bone mineralmeasurement) by using Dual energy X-ray absorptiometry (DXA scan).Positron Emmetion tomography (PETscan)

3-CLINICAL TEACHING

TEACHING AND LEARNING METHODS:

- Lectures.
- Tutorials. (Case presentation & small group discussion).
- Practice daily work (radiology and nuclear medicine frame work reporting and how to use the computer in reporting and radiological data archiving.
- Clinical bedside teaching.

ASSESSMENT METHODS:

Toatal marks: 100
Clinical assessment: 20%
Final exam: 65%
- Single best answer questions.
- Computer based clinical exam (for example short answer slide show).
- Extended matching questions (EMA).
- Oral exam.

Objective structured clinical examination (OSCE): 15%

LIST OF REFERENCES:

1. Teaching staff leactures.
2. Getting started in Clinical Radiology from Image to Diagnosis. George W. Eastman – Christoph Wald – Jane Crossin ISBN 3-13-140361-6.
3. Undergraduate Diagnostic Imaging Fundamentals Brent Burbridge, University of Saskatchewan.Evan Mah, and University of Saskatchewan Copyright Year: 2017 ISBN 13: 9780888806116.

STAGE 3
THE TRAINING STAGE (INTERNSHIP STAGE)

STAGE 3: THE TRAINING STAGE (INTERNSHIP STAGE)

After successfully passing all the courses, the student will begin the training course (internship). The bachelor's degree in medicine and surgery is only awarded after completion of the training period as stated below.

OBJECTIVE OF INTERN SHIP TRAINING PROGRAM:

It is an opportunity to apply, and expand clinical knowledge and skills, and gradualy increase responsibility to providing safe, high-quality patient care meets the community needs; to develop research skills and to develop new capabilities and career planning.

INTENDED LEARNING OUTCOMES:

A.KNOWLEDGE AND UNDERSTANDING

1. Describe the pathophysiology of common health problems.
2. Outline the causes of common medical problems.
3. Recognize the presentation of common medical emergencies.
4. Identify the principles of disease prevention and health promotion and infection control at the health facility.
5. Identify important medications and List the side effect of frequently used drugs.

B.INTELLECTUAL SKILLS

1. Exhibit critical thinking and problem-solving skills by analysing underlying conditions faced at real practical life.
2. Provide patient-centered care through the integration of medical knowledge, clinical competency, and professionalism.
3. Discuss issues related to environmental health, occupational health and nutritional health.
4. Discuss appropriate diagnostic and therapeutic management strategies for common deseases.
5. Acquire the ability to conduct a research-based on ethical and scientific evidence.

C.PRACTICAL AND PROFESSIONAL SKILLS

1- Demonstrate the ability to take a history, perform physical examination and diagnosis and manage common clinical problems.
2- Manage the common types of emergencies (medical, surgical, obstetric, and pediatrics)

3- Demonstrate the ability to screen patients for common diseases in the community and apply the concepts of risk assessment and risk management.
4- Order and interpret the results of the main tests relating to investigations based on the presentation of common medical problems.
5- Discuss the management plan for common medical conditions.
6- Perform basic procedures and prescribe, and to monitor drugs and fluids under supervision.
7- Demonstrate the ability to document, register health information of the patients, writhing prescription and notify the common health problem; and make appropriate referrals.

D.GENERAL AND TRANSFERABLE SKILLS

1- Communicate clearly, sensitively and effectively with patients, their families, doctors, and other health professionals.
2- Apply health education at a level of individual and community.
3- Respect the patient's rights, dignity, privacy, information confidentiality, and autonomy.
4- Manage time effectively.
5- Leadership and working cooperatively and effectively with others.
6- Apply life- long learning and continuous development.

COURSE CONTENTS

Department	Surgery	Medicine	Pediatric	Obstetrics &gynecology	Community medicine	Intensive care	Sychatery - Elective
Duration (week)	**12**	**12**	**8**	**8**	**4**	**4**	**4**
units	**6**	**6**	**4**	**4**	**2**	**2**	**2**

ASSESSMENT METHODS

During Internship emphasis will be laid on practical “hands-on” experience and building deep knoweledge and practicl skill on history taking, clinical examination and interpret lab result. The concerned departments will be encouraged to develop a diary / log book which gives details of tasks / cases to be seen by the intern’s undersupervision of senior

REFERENCES:
According to unit guidline.

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