جـــامعة غـــــريان

كلية الطب البشري

Unified Study Program

For Medical Colleges

Gharyan Medical College

2022

Anatomy syllabus

First and Second year

Anatomy I	
Course name	Anatomy I
code	ANAT1101
Course type	specialty
Accredited hours	7
Educational hours	340 hour
Prerequisite requirements	Admission criteria and selection
Program offered the course	Bachelor of medicine Bachelor of surgery
Instruction language	English
Date of course approval	September 2022

course Description	This course extends to 34 weeks ,students are provided with the basic and detailed knowledge of the anatomical structure of the body regions and normal human development
Course objectives	• Providing students with knowledge concerning the normal structure of the human body at the level of the anatomical regions and organs • To study the normal growth and development relevant to anatomical topics. • To correlate anatomical facts with their clinical application
references	Clinical anatomy for medical students. Richard S. Snell. Gray's Anatomy, Drake, R.L., Vogl, W. Mitchell, A.W.M Grant s atlas of anatomy, Agur, A.M.R. Dalley, A.F Langman s medical embryology ,Sadler , T.W
Methods of teaching	Lectures Tutorials Practical using: Models, palatinate bodies, cadavers, x-ray films, CT and MRI films, Videos ,3D software , skeletons .
Tools of assessment	Midterm exam, MCQ, matching questions 20_25% Final exam (75_80%) Written, MCQ, matching questions. Practical, OSPE. Oral exam
Duration of the course	34 weeks

Syllabus Breakdown
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.
. **Bones of upper limb:** (1 lecture, 1 hrs. practical) 2. **Pectoral region:** (1 lecture, 1hr practical)
Breast. - Muscles.
. **Axilla:** (1 lecture, 1hr practical) - Inlet, Walls, contents (brachial plexus, axillary artery, axillary vein, axillary lymph vessels and nodes, maxillary process of the breast …)
Back musclature: (1 lecture, 1 hr practical) 5. **Rotator cuff:** Muscles: (1 lecture, 1 hr practical) - Supraspinatus, infraspinatus, teres minor, subscapularis
6. **Anatomical spaces (Quadrungular, triangular):** (1 lecture, 1 practical) - Boundaries and structures passing through 7. **Arterial anastomosis:** (1 lecture, 1hr practical)
. **Joints:** (1 lecture, 1 hr practical) - Sternoclavicular joint - Acromioclavicular joint - Shoulder joint - Scapular– Humera mechanism
9. **The upper arm:** (1 lecture, 1 hr practical) 10. **The forearm:** (1 lecture, 1 hr practical)
11. **The wrist region:** (1 lecture, 1 hr practical) - Structures anterior to the wrist

– Structures posterior to the wrist
12. Joints of the upper limb: (2 lectures, 2 hr practical)
13. Nerves of the upper limb: (2 lectures, 2 hr practical)
14. Blood supply to the upper limb: (1 lecture, 1hr practical)
15. The hand: (2 lectures, 2 hr practical)
General Embryology 1. Gametogenesis (spermatogenesis and oogenesis). Uterine cycle (phases) 2. Reproductive cycles:
. 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).
I–THORAX: (6 lectures, 6 hr practical) – 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.
IV– 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 • Nerve supply

Course name	Anatomy II
Code	ANAT1201
Course type	specialty
Accredited units	6
Educational hours	272hours
Prerequisite requirements	ANAT1101 , BIOC1103, HIST1102 ,PHYS1104
Program offered the course	Bachelor of medicine, Bachelor of surgery
Instruction language	English
Date of course approval	September 2022

course Description	This course extends to 34 weeks ,students are provided with the basic and detailed knowledge of the anatomical structure of the body regions and normal human development
Course objectives	• Providing students with knowledge concerning the normal structure of the human body at the level of the anatomical regions and organs • To study the normal growth and development relevant to anatomical topics. • To correlate anatomical facts with their clinical application
references	Clinical anatomy for medical students. Richard S.Snell. Gray's Anatomy, Drake, R.L.,Vogl,W.Mitchell ,A.W.M Grant s atlas of anatomy, Agur, A.M.R. Dalley, A.F Langman s medical embryology ,Sadler , T.W
Methods of teaching	Lectures Tutorials Practical using: Models, palatinate bodies, cadavers, x_ray films, CT and MRI films, Videos ,3D software , skeletons .
Tools of	Midterm exam, MCQ, matching questions

assessment	20_25% Final exam (75_80%) Written, MCQ, matching questions. Practical, OSPE. Oral exam
Duration of the course	34 weeks

Syllabus Breakdown
- **ABDOMEN**: (16 lectures, 8 hrs. practical) - Anterior abdominal wall.
Peritoneum, Esophagus (abdominal part).
Stomach. Small intestine: (duodenum, jejunum and ilium).
- Large intestine.
- Liver and biliary system.
Pancreas and spleen
Retroperitoneal space
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
Contents of the pelvic cavity • Pelvic viscera in the male
Male genital organs (prostate gland , seminal vesicle , vas deferens
Female genital organs (uterus , ovaries)
• 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).
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
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 Para nasal air sinuses Oral cavity, Pharynx. Larynx.
NEUROANATOMY: • Neuroanatomical terms and Organization of the central nervous system
Cerebral hemispheres: External appearance and surfaces. • Internal structure of cerebral hemispheres
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

Histology Syllabus

First and Second year

Histology I	
Course name	Histology I
Code	HIST1102
Course type	specialty
Accredited hours	4
Educational hours	204 hours
Prerequisite requirements	Admission criteria and test
Program offered the course	Bachelor of Medicine ,Bachelor of Surgery
Instruction language	English
Date of course approval	September 2022

Brief description	The course extends for 34 weeks , it allows students to obtain fundamental knowledge of the normal histological structure of the human cell and different tissues of the body, also to provide students with understanding of the human genetics, structure of chromosomes and their structural and numerical anomalies .
Course objectives	• To understand the basic knowledge related to the cell and tissue structure and their relationship to their biological functions. • To provide practical knowledge in terms of understanding tissue structure using the basics techniques of light, electron microscopes, etc. • To discuss the basic molecular aspects of certain cellular and tissue components (Membrane, Cytoskeleton, and Matrix). • To distinguish Epithelial and connective tissue. • To understand the basic structure of genetic materials. • To understand the basics histology structure of, connective tissue, Blood and Hematopoiesis, skin, bone and cartilage, nervous tissue, muscular tissue and circulatory system tissue, immune system and lymphoid organs. • To understand the basics tissue structure of the Nervous system, Digestive system tract, Respiratory system, Urinary system, Male and Female reproductive systems, Endocrine system and sense organs
Course duration	34 weeks
Methods of	Lectures .

teaching	Tutorials. Practical. Student presentations .
Tools of assessment	Mid _term Exam (20%) Written exam in different forms Final written exam ,MCQs, Matching questions ,fill the blanks etc.(50%) Practical exam. (20%) Oral exam. (10%)
references	Basic histology, Junqueira et al Histology text and atlas , Ross et al DiFiore s of histology, Eroschenko PhD, Victor P Concise histology , Bloom& Fawcett

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

o **Components ofthe Nucleus**.

- Nuclear Envelope.
- Chromatin.
- Nucleolus.

o **The Cell Cycle**.

o **Mitosis**.

o **Meiosis**.

o **Apoptosis**

EPITHELIUM TISSUE

o **Characteristic Features of Epithelial Cells**.

- Basement Membranes.
- Intercellular Adhesion & Other Junctions.

o **Specializations of the Apical cell Surface**.

- Microvilli.

Stereocilia.

- Cilia.

Types of Epithelia.

- Covering or Lining Epithelia.
- Secretory Epithelia & Glands.

o **Transport across Epithelia**.

o **Renewal of Epithelial Cells**.

V. CONNECTIVE TISSUE (7 Lectures)

o **Cells of Connective Tissue**.

– Fibroblasts. – Adipocytes. – Macrophages & the Mononuclear Phagocyte System. – Mast Cells. – Plasma Cells. – Leukocytes
Fibers – Collagen. – Reticular Fibers. – Elastic Fibers. o **Ground Substance**.
Types of Connective Tissue. – Connective Tissue Proper. – Reticular Tissue. – Mucoid Tissue.
GENETIC o DNA structure. o Chromosome organization. o Gene structure.
DNA replication. o DNA transcription. o DNA translation.
DNA mutation and repair. o DNA recombination.
BLOOD AND HEMATOPOIESIS (3 lectures) o Composition of Plasma. ▪ Blood Cells. ▯ Erythrocytes. ▯ Leukocytes. ▯ Platelets.
Stem Cells, Growth Factors, & Differentiation. ▪ Hemopoietic Stem Cells. ▪ Progenitor & Precursor Cells.
Bone Marrow. o Maturation of Erythrocytes. o Maturation of Granulocytes.

o Maturation of Agranulocytes.

▪ Monocytes.

▪ Lymphocytes.

o Origin of Platelets

CARTILAGE (3 lectures)

o Hyaline Cartilage.

▪ Matrix.

▪ Chondrocytes.

▪ Perichondrium.

o Elastic Cartilage.

o Fibrocartilage

Cartilage Formation, Growth, & Repair.

• **BONE** (3 lectures)

o Bone Cells.

▪ Osteoblasts.

▪ Osteocytes.

▪ Osteoclasts.

o Bone Matrix.

o Periosteum & Endosteum.

o Types of Bone.

▪ Lamellar Bone.

▪ Woven Bone.

o Osteogenesis.

▪ Intramembranous Ossification.

▪ Endochondral Ossification.

o Bone Remodeling & Repair.

NERVOUS TISSUE (3 lectures)

o Development of Nerve Tissue.

o Neurons.

▪ Cell Body.

▪ Dendrites.

▪ Axons.

▪ Nerve Impulses.

▪ Synaptic Communication.

o Glial Cells & Neuronal Activity.

▪ Oligodendrocytes.

▪ Astrocytes.

▪ Ependymal Cells.
▪ Microglia.
▪ Schwann Cells
MUSCLE TISSUE (3 lectures)
o Skeletal Muscle.
▪ Organization of A Skeletal Muscle.
▪ Organization within Muscle Fibers
Sarcoplasmic Reticulum &Transverse Tubule System.
▪ Mechanism of Contraction.
▪ Innervation.
Muscle Spindles & Tendon Organs.
▪ Skeletal Muscle Fiber Types.
o Cardiac Muscle.
▪ Smooth Muscle.Satellite Cells of Ganglia.
CIRCULATORY SYSTEM (3 lectures)
o Heart.
o Tissues of the Vascular Wall.
Vasculature.
▪ Elastic Arteries.
▪ Arterial Sensory Structures.
▪ Muscular Arteries.
▪ Arterioles.
Capillary Beds.
▪ Venules.
▪ Veins.
o Lymphatic Vascular System.
IMMUNE SYSTEM AND LYMPHOID ORGANS (3 lectures)
o Innate & Adaptive Immunity.
o Cytokines
Antigens & Antibodies.
▪ Classes of Antibodies.
▪ Actions of Antibodies.
o Antigen Presentation
Cells of Adaptive Immunity.
▪ Antigen–Presenting Cells.
▪ Lymphocytes.

Thymus. ▪ Role of the Thymus in T–Cell Maturation & Selection. o Mucosa–Associated Lymphoid Tissue.
Lymph Nodes. ▪ Role of Lymph Nodes in the Immune Response. Spleen. Functions of Splenic White & Red Pulp.
SKIN (3 lectures) o Epidermis. ▪ Melanocytes. ▪ Langerhans Cells. ▪ Merkel Cells. o Dermis
Subcutaneous. o Sensory Receptors. o Hair. o Nails. o Skin Glands. ▪ Sebaceous Glands. ▪ Sweat Glands. ▪ Mucoid Tissu

Histology II	
Course name	Histology II
Code	HIST1202
Course type	specialty
Accredited hours	4
Educational hours	204 hours
Prerequisite requirements	ANAT1101,BIOC1103,PHYS1104,HIST1102
Program offered the course	Bachelor of Medicine ,Bachelor of Surgery
Instruction language	English
Date of course approval	September 2022

Brief description	The course extends for 34 weeks , it allows students to obtain fundamental knowledge of the normal histological structure of the human cell and different tissues of the body, also to provide students with understanding of the human genetics, structure of chromosomes and their structural and numerical anomalies .
Course objectives	• To understand the basic knowledge related to the cell and tissue structure and their relationship to their biological functions. • To provide practical knowledge in terms of understanding tissue structure using the basics techniques of light, electron microscopes, etc. • To discuss the basic molecular aspects of certain cellular and tissue components (Membrane, Cytoskeleton, and Matrix). • To distinguish Epithelial and connective tissue. • To understand the basic structure of genetic materials. • To understand the basics histology structure of, connective tissue, Blood and Hematopoiesis, skin, bone and cartilage, nervous tissue, muscular tissue and circulatory system tissue, immune system and lymphoid organs. • To understand the basics tissue structure of the Nervous system, Digestive system tract, Respiratory system, Urinary

	system, Male and Female reproductive systems, Endocrine system and sense organs
Course duration	34 weeks
Methods of teaching	Lectures. Tutorials. Practical. Student presentations.
Tools of assessment	Mid _term Exam (20%) Written exam in different forms Final written exam, MCQs, matching questions, fill the blanks etc. (50%) Practical exam. (20%) Oral exam. (10%)
references	Basic histology, Junqueira et al Histology text and atlas , Ross et al DiFiore s of histology, Eroschenko PhD, Victor Concise histology , Bloom& Fawcett

Syllabus Breakdown
NERVOUS SYSTEM (4 lectures) o Central Nervous System.
Meninges.
Blood–Brain Barrier. ▪ Choroid Plexus
Peripheral Nervous System. ▪ Nerve Fibers. ▪ Nerve Organization.
Ganglia.
Neural Plasticity & Regeneration.
DIGESTIVE TRACT. o General Structure of the Digestive Tract.
Oral Cavity. ▪ Tongue. ▪ Teeth. ▪ Dentin.

Esophagus. o 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 in the Liver. ▪ Biliary Tract & Gallbladder.
THE RESPIRATORY SYSTEM. (3 lectures) o Nasal Cavities. ▪ Respiratory Epithelium. ▪ Olfactory Epithelium. ▪ Paranasal Sinuses.
Pharynx. o Larynx. o Trachea
Bronchial Tree & Lung. ▪ Bronchi. ▪ Bronchioles. ▪ Respiratory Bronchioles.
Alveolar Ducts. ▪ Alveoli. o Regeneration in the Alveolar Lining.
Lung Vasculature & Nerves. o Pleural Membranes.
URINARY SYSTEM. o Kidneys. o Blood Circulation
Renal Function: Filtration, Secretion, & Reabsorption.

▪ Renal Corpuscles & Blood Filtration. ▪ Proximal Convoluted Tubule. ▪ Loop Of Henle ▪ Distal Convoluted Tubule & Juxtaglomerular Apparatus.
Collecting Ducts. o Ureters. o Bladder. o Urethra
MALE REPRODUCTIVE SYSTEM. o Testes. ▪ Interstitial Tissue. ▪ Seminiferous Tubules. ▪ Spermatogenesis. ▪ Spermiogenesis. ▪ Sertoli Cells.
Intratesticular Ducts. o Excretory Genital Ducts. ▪ Epididymis. ▪ Vas Deferens.
o Accessory Glands. ▪ Seminal Vesicles. ▪ Prostate Gland. ▪ Bulbourethral Glands. o Penis.
FEMALE REPRODUCTIVE SYSTEM. o Ovaries. ▪ Early Development of the Ovary. ▪ Ovarian Follicles. ▪ Follicular Growth & Development. ▪ Follicular Atresia. ▪ Ovulation & Its Hormonal Regulation. ▪ Corpus Luteum.
Uterine Tubes. o Uterus. ▪ Myometrium. ▪ Endometrium. ▪ Menstrual Cycle.

▪ Proliferative Phase. Secretory Phase. ▪ Menstrual Phase
Embryonic Implantation, Decidua & the Placenta. o Cervix and Vagina.
External Genitalia. o Mammary Glands. ▪ Breast development during Puberty. ▪ Breasts during Pregnancy & Lactation. ▪ Postlactational Regression in the Mammary Glands.
ENDOCRINE SYSTEM o Pituitary Gland. o Adrenal Glands
Pancreatic Islets. o Diffuse Neuroendocrine System.
Thyroid Gland. o Parathyroid Glands. o Pineal Gland
SENSE ORGANS o Eyes. ▪ Fibrous Layer. ▪ Vascular Layer. ▪ Lens. ▪ Vitreous Body. ▪ Retina. ▪ Accessory Structures Of The Eye.
Ears. ▪ External Ear. ▪ Middle Ear. ▪ Internal Ear.
Replacement

Biochemistry Syllabus

First and Second year

Biochemistry I	
Course name	Biochemistry I
code	BIOC 1103
Course type	specialty
Accredited units	5
Educational hours	238
Prerequisite requirements	Admission criteria
Program offered the course	MBBCH
Instruction language	English
Date of course approval	September 2022

Brief description	The course is a 34 weeks course, which aim to introduce the students to biochemistry to allow them to understand the biochemical reactions and cycles behind the cell and body functions and how the metabolism is integrated and controlled.
Course objectives	To be able to distinguish between different chemical bonds, functional groups, aliphatic and aromatic hydrocarbons. – To understand the interaction of biomolecules with water. – To be familiar with pH and physiological buffers and the imbalances of blood pH (alkalosis and acidosis). – To know the structure and physical properties of the building blocks of protein, carbohydrate, nucleotides and nucleic acids. – To be familiar with the terminology of nucleoside and nucleotide. To understand the chemistry of lipids and their physiological importance. – To know how enzymes increases biochemical reactions and role of coenzymes and cofactors. – To understand the components of the electron transport chain (E.T.C), location, components, energy span and redox span of E.T C, inhibitions of E.T.C. 1. To understand the biological importance of digestion, and

	absorption of carbohydrate, lipid, protein, purines, and pyrimidines and explain their metabolism and regulation. 2. To discuss the integration and regulation of the major metabolic pathways To know aboutexpression of genetic information. - To discusse regulation of gene expression and recombinant DNA. - To know the clinical application of enzymes in the diagnosis and prognosis of diseases, enzymes as reagents, enzymes as labeling reagents in-ELISA and enzymes as therapeutic agent. - To describe the metabolism of heme and related disorders.
duration	34 weeks
Methods of teaching	Lectures Tutorials Practical sessions in the lab
Tools of assessment	Midterm exam, written (MSQ and matching questions Final exam, Written MSQs, matching questions Practical exam Oral exam
references	1. (Lippincott of biochemistry.Champe PC,Harvey RA,Ferrier Dr 2. Harper's illustrated biochemistry.Murray RK.Granner DK.Mayes PA,Rodwell VW

Syllabus Breakdown
Introduction - Biomolecules
Introduction Chemical bonds,
Introduction Organic chemistry
Introduction Functional groups, Aliphatic and aromatic hydrocarbones.
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).
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
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 glycolipid
Steroids: definition, structure and function Lipid peroxidation
Separation and identification of lipids. Digestion and absorbance of lipids and clinical correlation.
II. VITAMINS AND COENZYMES (12 lectures)

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).
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 sit.
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. BIOENERGITICS (6 Lectures) 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
VI. BODY FLUIDS AND NUTRITION (8 Lectures) 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.
Revision

Biochemistry II	
Course name	Biochemistry II
code	BIOC 1203
Course type	specialty
Accredited hours	6
Educational hours	272 hours
Prerequisite requirements	ANAT1101,BIOC1103,PHY1104, HIST1102
Program offered the course	Bachelor of Medicine and Bachelor of Surgery.
Instruction language	English
Date of course approval	September 2022

Brief description	The course is a 34 weeks course, which aim to introduce the students to biochemistry to allow them to understand the biochemical reactions and cycles behind the cell and body functions and how the metabolism is integrated and controlled.
Course objectives	To be able to distinguish between different chemical bonds, functional groups, aliphatic and aromatic hydrocarbons. To understand the interaction of biomolecules with water. To be familiar with pH and physiological buffers and the imbalances of blood pH (alkalosis and acidosis). To know the structure and physical properties of the building blocks of protein, carbohydrate, nucleotides and nucleic acids. To be familiar with the terminology of nucleoside and nucleotide. To understand the chemistry of lipids and their physiological importance. To know how enzymes increases biochemical reactions and role of coenzymes and cofactors. To understand the components of the electron transport chain

	(E.T.C), location, components, energy span and redox span of E.T C, inhibitions of E.T.C. 1. To understand the biological importance of digestion, and absorption of carbohydrate, lipid, protein, purines, and pyrimidines and explain their metabolism and regulation. 2. To discuss the integration and regulation of the major metabolic pathways To know aboutexpression of genetic information. To discusse regulation of gene expression and recombinant DNA. To know the clinical application of enzymes in the diagnosis and prognosis of diseases, enzymes as reagents, enzymes as labeling reagents in-ELISA and enzymes as therapeutic agent. To describe the metabolism of heme and related disorders.
duration	34 weeks
Methods of teaching	Lectures Tutorials Practical sessions in the lab
Tools of assessment	Midterm exam, written (MSQ and matching questions Final exam, Written MSQs, matching questions Practical exam Oral exam
references	1. (Lippincott of biochemistry.Champe PC,Harvey RA,Ferrier Dr 2. Harper's illustrated biochemistry.Murray RK.Granner DK.Mayes PA,Rodwell VW

Syllabus Breakdown
Digestion and absorption of carbohydrates transport of glucose and rate of absorbed sugars. Insulin, receptors and glucose transporters. Glycolysis (aerobic and anaerobic), free energy.
Changes of glycolysis, alternative fate of pyruvate, regulation of glycolysis. Clinical aspects impairment of pyruvate metabolism and lactic acidosis, pyruvate kinase deficiency.
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

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

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

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).

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

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

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

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.

Molecular biology

Expression of Genetic information

DNA replication and repair.

Transcription and RNA processing.

Protein synthesis.

Mutations.

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.
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.
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, posttranscriptional modifications. Mutation: Base substitution, insertion and deletion of bases
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).
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 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 malignancies, enzyme assay to evaluate degree of toxicity and deficiency of some vitamins (or cofactors).

Porphyrin and Bile pigments (4 Lectures)

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. Thalasemia

Hormonesand cell signalling (4 Lectures)

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 …etc)

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.

Physiology Syllabus

First and Second year

Physiology I	
Course name	**Physiology I**
Code	PHYS1104
Course type	specialty
Accredited hours	5
Educational hours	238 hours
Prerequisite requirements	Admission criteria and test
Program offered the course	Bachelor of Medicine ,Bachelor of Surgery
Instruction language	English
Date of course approval	September 2022

Brief description	This course extends for 34 weeks , it provides students with an understanding of the function and regulation of the human body and integration of the organ systems to maintain homeostasis
Course objectives	To acquire knowledge of normal function and regulation of different body systems. To understand the mechanisms underlying the function of organ systems. To state the functions of the respiratory, blood, and gastrointestinal systems, and recognize the mechanisms by which these functions are carried. To know the pathophysiology underlying some respiratory, hematological, and GIT disorders. To understand the interrelations of the various body systems. To explain the integrated responses of the body systems to physiological stresses. To state the functions of the cardiovascular and renal systems, and explain the mechanisms by which these functions are carried. To understand and demonstrate the interrelations of the various body systems to each other. To know the pathophysiology of some cardiac, circulatory, and renal defects pertaining to the cardiovascular and renal systems.
duration	34 weeks
Methods of teaching	Lectures. Tutorials.

	Practical sessions in the lab . Student presentations.
Tools of assessment	Mid_term Exam (written, MCQ) Final exam: Written (MCQ, extended matching questions) Practical. Oral .
references	Guyton text book of human physiology and mechanism of disease by: Arthur C.Guyton ,John EHall Review of medical physiology. By WilliamF.Ganong

Syllabus Breakdown
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.
Regulation of ECF volume.
II– AUTONOMIC NERVOUS SYSTEM: (7 Lectures) 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.
Structure and function of nerve cell – Resting membrane potential Na+ – K+electrogenic pump – Action potential and its propagation – Spike potential Types of nerve fibers and their functions Properties of mixed nerves Velocity of conduction in nerve fibers.
Structure and functions of different types of muscle tissues – Differences between skeletal, smooth and cardiac muscles – Refratory period – Molecular mechanism of muscle contraction – Source of energy for muscle contraction and role of calcium – Chronaxie – Rheobase.

Neuromuscular transmission – End plate potential – Drugs affecting neuromuscular junction – Myasthenia gravis.
Function of smooth muscle – Types of smooth muscle Contractile process and neuromuscular junction in smooth muscle. Isotonic and isometric contractions – Muscular fatigue Tetanus – Twitch and clonus – Muscular atrophy and hypertrophy.
1. To state the functions of the respiratory, blood, and gastrointestinal systems, and recognize the mechanisms by which these functions are carried. 2. To know the pathophysiology underlying some respiratory, hematological, and GIT disorders. 3. To understand the interrelations of the various body systems. 4. To explain the integrated responses of the body systems to physiological stresses.
I- BLOOD AND IMMUNITY (12 Lecture, 2hr practical) 1.1- **Composition and function of blood.**
1.2- **Red blood cells:** Production of RBC – Types and formation of haemoglobin – Iron metabolism – Destruction of RBC – Anaemia and Jaudice – Polycythaemia
.3-**White blood cells:** Genesis and properties different types and their functions – Reticulo-endothelial system – Leukocytosis – Leukopenia – Leukemia
1.4- Plasma **proteins:** Types – Origin and functions. 1.5- **Blood groups and blood transfusion** (A, B, O) bloods: Blood typing - Transfusion reaction - Rh blood groups - Rh immune response - Erythroblastosis fetalis.
1.6- **Hemostasis and blood coagulation:** Events of hemostasis and mechanism of blood coagulation - Coagulation test - Haemophilia.
1.7- **Immunity and allergy:** Types of acquired immunity - Role of lymphoid tissues – Vaccination - Passive immunity - Allergy
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
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
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.
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 (1st, 2nd, 3rd degree AV blocks and BBB) - Rapid arrhythmias (atrial and ventricular tachycardias) – Flutter and fibrillation - Ventricular hypertrophy- Ischemia and infarction.
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.
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.
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.

Physiology II	
Course name	Physiology II
Code	PHYS1204
Course type	specialty
Accredited hours	6
Educational hours	272hours
Prerequisite requirements	ANAT1101 ,BIOC1103 ,PHYS1104,HIST1102
Program offered the course	Bachelor of Medicine ,Bachelor of Surgery
Instruction language	English
Date of course approval	September 2022

Brief description	This course extends for 34 weeks , it provides students with an understanding of the function and regulation of the human body and integration of the organ systems to maintain homeostasis
Course objectives	To acquire knowledge of normal function and regulation of different body systems. To understand the mechanisms underlying the function of organ systems. To state the functions of the respiratory, blood, and gastrointestinal systems, and recognize the mechanisms by which these functions are carried. To know the pathophysiology underlying some respiratory, hematological, and GIT disorders. To understand the interrelations of the various body systems. To explain the integrated responses of the body systems to physiological stresses. To state the functions of the cardiovascular and renal systems, and explain the mechanisms by which these functions are carried. To understand and demonstrate the interrelations of the various body systems to each other. To know the pathophysiology of some cardiac, circulatory, and renal defects pertaining to the cardiovascular and renal systems.
duration	34 weeks
Methods of teaching	Lectures. Tutorials. Practical sessions in the lab . Student presentations.
Tools of assessment	Mid_term Exam (written, MCQ) Final exam : Written (MCQ ,extended matching questions) Practical . Oral .
references	Guyton text book of human physiology and mechanism of disease by : Arthur C.Guyton ,John EHall Review of medical physiology . By WilliamF.Ganong

Syllabus Breakdown
II- GASTRO-INTESTINAL PHYSIOLOGY: (12 Lectures) 2.1- **Functional anatomy of gastro-intestinal tract.** 2.2- **Salivary glands** – Composition and function of saliva – Mechanism of salivary secretion 2.3- **Mastication and deglutition**
2.6- **GIT mobility** – Types, function and mechanism.
2.7- **Pancreas** – Pancreatic juice – secretion and regulation – Secretin CCK – PZ. 2.8- **Small intestine** – Intestinal secretion – Gastro-ileac reflex. 2.9- **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.
2.10- **Absorption in the various parts of the GIT** – Factors affecting absorption – mechanism of absorption – Malabsorption syndromes.
Large intestine – Absorption of water and salts – Gastrocolic and duodenocolic reflexes – Mucous secretion – Defecation. 2.12- **Gastrointestinal hormones and their functions**.
II- RENAL PHYSIOLOGY: (12 Lectures) 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- 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.
.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 NH3) - Tubular mechanism for reabsorption of Na+, K+; H2O; HCO3 -; 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.

I– CENTRAL NERVOUS SYSTEM: (18 Lectures)

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.

II–ENDOCINOLOGY AND REPRODUCTIVE PHYSIOLOGY: (14 Lectures)

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.
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.
III-SPECIAL SENSES: (7 Lectures) 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.
3.11- 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.
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Pathology Syllabus

Third year

Pathology	
Course name	**Pathology**
Code	PATH1307
Course type	specialty
Accredited hours	8
Educational hours	374 hours
Prerequisite requirements	ANAT1101, ANAT1201, HISTO1102 HISTO1202, BIOC1103, BIOC1203 PHYS1104,PHYS1204
Program offered the course	Bachelor of Medicine ,Bachelor of Surgery
Instruction language	English
Date of course approval	September 2022

Brief description	The course duration is 34 weeks , the course provides students with the core knowledge of disease processes , the pathological terms and the different diagnostic pathological tools.
Course objectives	Provide the medical students with the concepts of etiology, pathogenesis, microscopic and gross morphology, complications, and clinic pathologic correlation of human diseases through general and system based approaches. Focus on gaining competency in medical knowledge, with specific emphasis on core discipline and problem-solving competencies.
Course duration	34 weeks
Methods of teaching	Lectures Tutorials. Practical, histopathology slides, museum specimens, fresh surgical samples. Case studies and assignments.
Assessment tools	Mid-year exam 20% Written exam, MCQs, matching questions

	Final written Exam 50%. MCQs, case studies, matching questions Practical exam ,20% Gross and microscopic examination of tissues Oral exam 10%
References	Robbins and Cortran, pathological basis of disease, Kumar, Abbas, Aster Robbins and Cortran Atlas of pathology Klatt, Edward C Muir s textbook of pathology. Lecture notes and handouts offered by the department

Syllabus Breakdown
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, 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 a **Amyloidosis:** Definition, classification, the nature and aetiology of amyloidosis, morphology, clinical correlation. nd anthracosis).
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).

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.

1. DISEASE OF THE CARDIO VASCULAR SYSTEM: (12 lectures)

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.

B. **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: (10 lectures)

Lesions of the upper respiratory tract:

Acute and chronic infections of the nose, sinuses, and larynx.Nasopharyngeal carcinoma, laryngeal tumors, nonmalignant 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: (12 lectures)

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: (3 lectures)

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: (5 lectures)

The Pituitary (hypopituitarism, 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, hypothyroidism, 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.

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: (8 lectures)

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, $\alpha 1$-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).

A. DISEASE OF THE FEMALE GENITAL SYSTEM: (6 lectures)

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 of The Breast: (2 lectures)

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: (5 lectures)

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: (5 lectures)

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: (5 lectures) 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

Pharmacology Syllabus

Third year

Pharmacology	
Course Name	Pharmacology
Course Code	PHAR 1306
Course Type: (General/Specialty/Optional)	specialty
Accredited Units	9
Educational Hours	408 hrs
Pre-requisite Requirements	All first and second year courses
Program Offered the Course	MBBCH
Instruction language	English
Date Of Course Approval	September 2022

Textbooks required for this course	
Basic and clinical pharmacology	Katzung
Rang & Dale Pharmacology	Rang & Dale
Academic journal	Journal pharmacology
Internet websites	www.pubmed.com

Course duration
34 Weeks

Delivery (Teaching and Learning Methods)
• Formal Lectures • Practical sessions • Case studies, Group discussion & Assignments

Course Objectives
• To assist students in acquiring the fundamental knowledge of frequently used drug groups, pharmacokinetics, mode of action, and pharmacological properties. • Ensure complete understanding of proper use by learning regarding side effects including toxicity, contraindications, and drug – drug interaction • Ensuring that students have a clear understanding on the essentials of therapeutic applied to a wide range of disorders.

Course Assessments

Evaluation Method	Date	Marks 300	%	ILOs Assessed
Annual Work		60	20 %	
Mid-year Exam	January	45		Intellectual abilities, knowledge, and awareness
Quizzes & Assignments		15		
Final Exam	June	240	80%	
Written		150		Intellectual abilities, knowledge, and awareness
Practical		60		Aawareness, understanding, and intellectual abilities Skills that are both practical and professional Skills that are applicable
Oral		30		

Evaluation Schedule:

Evaluation		Date
Mid-term written exam:	It includes a varieties of questions; - True & False questions & Best answers choice Questions/ Multiple choice questions with case studies - Essay Questions – Matching and complete the blanks	January
Final written exam:		June
Practical exam.		June
Oral examination		June
Participation	Discussions, assignments/ continuous assessment exam…….etc)	Daily–Monthly

Lecture	Lab & Clinical cases
1. General pharmacology 1.1 Introduction 1.2. Pharmacokinetics of drugs. 1.2.1. Absorption. 1.2.2. Distribution. 1.2.3. Metabolism.	Factors influencing drug metabolism
1.2.4. Excretion	Effect of drugs on rabbit eye.

1.2.5. Factors affecting pharmacokinetics 1.3. Pharmacodynamics 1.3.1. Mode of drug action. 1.3.2. Drug receptors. 1.3.3. Dose-response relationship. 1.4. Adverse drug reactions. 1.5. Drug- drug and drug- food interactions.	
1.6. Drugs classification. 1.7. Drug evaluation. 1.7.1. Animal studies. 1.7.1.1. Toxicity studies. 1.7.1.2. Efficacy, potency, ED50, LD50 and therapeutic index. 1.7.2. Clinical evaluation. Patient at particular risks 1.8. Route of drug administration.	Effect of drugs on isolated rabbit jejunum
2. Autonomic and neuromuscular pharmacology 2.1. Introduction to PNS pharmacology. 2.2.1. Anatomical and physiological consideration. 2.2.2. Neurotransmitters. 2.2. Parasympathetic division of ANS (Cholinergic system). 2.2.1. Parasympathetic drugs. 2.2.1.1. Directly acting drugs. 2.2.1.2. Indirectly acting drugs. 2.2.1.3. Pharmacological action of parasympathetic drugs. 2.2.2. Parasympatholytic drugs. 2.2.2.1. Muscarinic antagonists.	Study of the dose-response relationship. 2.2.2
2.2.3. Nicotinic antagonists. 2.3. Pharmacological action of parasympatholytic 2.4. Sympathetic division of ANS	2.4.1 CLINICAL CASES

(Adrenergic system). 2.4.1. Sympathetic drugs. 2.4.1.1. Directly acting drugs. 2.4.1.2. Indirectly acting drugs. 2.4.1.3. Mixed action. 2.4.1.4. Pharmacological action of Sympathetic drugs	
2.4.2. Sympatholytic drugs. 2.4.2.1. Alpha adrenoceptor blockers. 2.4.2.2. Beta adrenoceptor blockers. 2.4.3. Adrenergic neuron blockers. 2.5. Pharmacology of the eye.	CLINICAL CASES
3. Autacoids 3.1. Histamine & histamine antagonists 3.2. .Serotonin &Serotonin antagonists. 3.3. Prostaglandins & thrmboxanes. 3.4. Leukotriens 3.5. Platelets activating factor 3.6. Rennin angiotensin system 3.7. Vasopressin & endothelins	CLINICAL CASES
4. Anti-Inflammatory Drugs. 4.1. Non-Steroidal Anti-Inflammatory Drugs (NSAIDS). 4.2. Non- narcotic analgesics. 4.3. Slow acting anti-rheumatic drugs. 4.4. Drugs used in gout. 4.5. Corticosteroids	Hot plate and acetic acid methods of inflammation in mice and study of NSAIDs and opioids analgesic activity.
5. Cardiovascular pharmacology. 5.1. Hypertension 5.1.1. Etiology of hypertension. 5.1.2. Classification of high blood pressure. 5.1.3. Antihypertensive drugs.	5.2.4 CLINICAL CASES

5.1.3.1. Diuretics 5.1.3.2. Sympathetic inhibitors. 5.1.3.3. Direct vasodilators. 5.1.3.4. Indirect vasodilators. 5.2. Drug therapy of myocardial ischemia 5.2.1. Pathophysiology of angina pectoris. 5.2.2. Types of angina. 5.2.3. Etiology & risk factors of angina pectoris. 5.2.4. Treatment of angina pectoris. 5.2.4.1. Organic nitrates. 5.2.4.2. β blockers. 5.2.4.3. Ca channel blockers. 5.2.4.4. Antithrombotic & antiplatelets agents.	
5.3. Management of heart failure. 5.3.1. Introduction of heart failure. 5.3.2. Pathophysiology of heart failure. 5.3.3. Classification of heart failure. 5.3.4. Classification of drugs used in heart failure. 5.3.4.1. Positive inotropic drugs. 5.3.4.2. Diuretics. 5.3.4.3. Angiotensin converting enzyme inhibitors (ACEI). 5.3.4.4. Vasodilators.	CLINICAL CASES
5.4. Anti- arrhythmic drugs. 5.4.1. Pathophysiology of cardiac arrhythmia. 5.4.2. Classification of cardiac arrhythmia.	CLINICAL CASES

5.4.3. Classification of anti-arrhythmic drugs. 5.4.3.1. Class I (Sodium channel blockers). 5.4.3.2. Class II (β-blockers). 5.4.3.3. Class III (Potassium channel blockers). 5.4.3.4. Class IV (Calcium channel blockers). 5.4.3.5. Miscellaneous: Digoxin, Adenosine, Magnesium ions, Potassium ions 5.5. Treatment of shock.	
6. Renal pharmacology. 6.1. Basic physiology of the kidney. 6.2. Diuretic drugs. 6.2.1. Carbonic anhydrase inhibitors. 6.2.2. Thiazide diuretics. 6.2.3. Loop diuretics. 6.2.4. Potassium sparing diuretics. 6.2.5. Osmotic diuretics & Anti-diuretics hormone	CLINICAL CASES
7. Central Nervous System pharmacology. 7.1. Analgesics. 7.1.1. Classification of analgesics. 7.1.1.1. Non-opioid analgesics. 7.1.1.2. Opioid analgesics 7.2. Anxiolytics & Sedative- hypnotic drugs. 7.2.1. Classification according to mechanism of action. 7.2.1.1. Drugs affecting GABA action. 7.2.1.2. 5HT1A agonist. 7.2.1.3. Others drugs with	7.2.1 CLINICAL CASES

anxiolytic or sedative–hypnotic effects.	
7.3. General anesthetics. 7.3.1. Stages of General anesthesia. 7.3.2. Classification of General anesthetics. 7.3.2.1. Inhalation anesthetics. 7.3.2.2. I.V. anesthetics. 7.3.2.3. Mechanism of action. 7.4. Local anesthetics. 7.4.1. Chemical classification of General anesthetics. 7.4.1.1. .Esters. 7.4.1.2. Amides. 7.4.2. Mechanism of action.	CLINICAL CASES 7.4.3.
7.5. Antiepileptic drugs. 7.5.1. Causes of epilepsy. 7.5.2. Pathophysiology of epilepsy. 7.5.3. Antiepileptic drugs. 7.5.3.1. Causes of Alzheimer's disease. 7.5.3.2. Pathophysiology of Alzheimer's disease. 7.5.3.3. Drugs used to treat Alzheimer's disease. 7.6. Treatment of CNS degenerative disorders. 7.6.1. Parkinson's disease. 7.6.1.1. Causes of Parkinsonism. 7.6.1.2. Pathophysiology of Parkinsonism. 7.6.1.3. Antiparkinsonian drugs.	7.6.1 PTZ induced convulsions in rats and study of antiepileptic activity of some drugs.
7.6.2. Alzheimer's disease. 7.6.2.1. Causes of Alzheimer's disease.	Catatonia produced by perphenazine in rats and tremors produced by

7.6.2.2. Pathophysiology of Alzheimer's disease. 7.6.2.3. Drugs used to treat Alzheimer's disease. 7.6.3. Huntington's disease. 7.6.3.1. Causes of Huntington's disease. 7.6.3.2. Pathophysiology of Huntington's disease. 7.6.3.3. Drugs used to treat Huntington's disease. 7.7. Antidepressants. 7.7.1. Introduction. 7.7.2. Pathogenesis of depression. 7.7.3. Classification of depression. 7.7.4. Classification of antidepressants drugs. 7.7.4.1. First generation. 7.7.4.2. Second generation. 7.7.4.3. Third generation. 7.7.4.4. Selective serotonin reuptake inhibitors. 7.7.4.5. Monoamine oxidase inhibitors. 7.7.4.6. Lithium.	oxotremorine in mice and study of the 7.7.4
7.8. Antipsychotic drugs (neuroleptics). 7.8.1. Introduction. 7.8.2. Pathogenesis of schizopherenia. 3.2.1. Classification of antipsychotics drugs. 3.2.1.1. Classical drugs. 3.2.1.2. Atypical drugs. 7.9. CNS stimulant drugs. 7.9.1. Classification of CNS stimulant. 7.9.1.1. Cerebral stimulants. 7.9.1.2. Brain stem stimulants.	Antiparkinsonism activity of antimuscarinic drugs

7.10. Spinal cord stimulants.	
7.11. Opioid agonist & antagonist 7.12. Drug abuse. 7.12.1. Classification of drugs of abuse. 7.12.1.1. CNS Depressants. 7.12.1.2. CNS Stimulants. 7.12.1.3. Hallucinogens. 7.12.1.4. Cannabis. 7.12.1.5. Inhalants.	CLINICAL CASES
8. Blood pharmacology. 8.1. Drug therapy of thrombosis. 8.1.1. Anticoagulant. 8.1.2. Antiplatelets. 8.1.3. Fibrinolytics. 8.2. Drugs used in bleeding disorders. 8.3. Drugs therapy of anemia. 8.3.1. Drugs therapy of iron-deficiency anemia. 8.3.2. Drugs therapy of megaloblastic anemia. 8.4. Drug-induced blood disorders. 8.5. Drugs therapy of hyperlipidemia.	CLINICAL CASES
9. Gastrointestinal pharmacology. 9.1. Drug therapy of acid- related GIT diseases. 9.2. Drug therapy of peptic ulcer. 9.3. Drug therapy of gastroesophageal reflux disease. 9.4. Drug therapy of vomiting. 9.5. Drug therapy of diarrhea. 9.6. Drug therapy of constipation. 9.7. Drug therapy of irritable bowel syndrome	CLINICAL CASES
10. Respiratory pharmacology. 10.1. Introduction to Bronchial asthma. 10.1.1. Classification of asthma.	CLINICAL CASES

10.1.2. Drug therapy of Bronchial asthma. 10.1.2.1. Short- term relievers. 10.1.2.2. Long- term controllers. 10.2. Drug therapy of cough. 10.2.1. Antitussive. 10.2.2. Expectorants. 10.2.3. Others (bronchodilators and decongestants). 10.2.4. Drug therapy of chronic obstructive pulmonary disease.	
11. Endocrine pharmacology. 11.1. Hypothalamic Hormones. 11.2. Pituitary Hormones. 11.2.1. Anterior Pi 11.2.2. Posterior Pituitary Hormones.	CLINICAL CASES
11.3. Thyroid Hormones & Antithyroid drugs. 11.4. Adrenocorticosteroids.	CLINICAL CASES
11.4.1.1.1. Sex hormones & hormonal contraception. 11.4.1.1.2. Drugs used in treatment of diabetes mellitus.	CLINICAL CASES
11.5. Agents Affecting Bone Ca Homeostasis. 11.5.1. Parathyroid hormone. 11.5.2. Vitamin D. 11.5.3. Calcitonin. 11.5.4. Non-hormonal agents affecting bone mineral homeostasis.	CLINICAL CASES 11.5.5.
12. Chemotherapy 12.1. Itroduction 12.2. Classification of antimicrobial drugs 12.2.1. B-lactam antibiotic (pencillins, Cephalosporins & others) 12.2.2. Sulphonamides and trimethoprim 12.2.3. Aminoglycosides	CLINICAL CASES
12.2.4. Quinolones and urinary antiseptics 12.2.5. Broad spectrum antibiotics and others	CLINICAL CASES

12.2.6. Antitubercular and antileprotic drugs	
12.2.7. Antiviral drugs. 12.2.8. Anti HIV drugs. 12.2.9. Other drugs: 12.2.10. Antifungal drugs 12.2.11. Clinical aspects of antimicrobial drugs.	CLINICAL CASES
12.2.12. Antiparasitic drugs. 12.2.12.1. Antiprotozoal drugs. 12.2.12.2. Antimalarial drugs. 12.2.12.3. Antiamoebic drugs. 12.2.12.4. Trypanosomiasis drugs. 12.2.12.5. Leishmanisis drugs. 12.2.13. Antihelmintics drugs. 12.2.13.1. Drugs for nematodes 12.2.13.2. Drugs for trematodes. 12.2.13.3. Drugs for cestodes. 12.2.13.4. Drugs for giardiasis. 12.2.13.5. Drugs for trichomoniasis	CLINICAL CASES 12.2.14.
13. Anti-cancer chemotherapy 14. Miscellaneous topics 14.1. Chelating agents and treatment of poisoning	CLINICAL CASES
14.2. Immuno-suppressants 14.3. Pharmacogenetics	CLINICAL CASES
14.4. Treatment of drug toxicity and poisoning 14.5. Drug interactions 14.6. Drug adverse effects	CLINICAL CASES
14.7. Prescription writing 14.8. Drugs used in pregnancy, lactation, neonates, the elderly and disease states	CLINICAL CASES

Microbiology Syllabus

Third year

Microbiology	
Course name	Microbiology
Code	MICR1308
Course type	specialty
Accredited hours	7
Educational hours	340 hours
Prerequisite requirements	ANAT1101,HIST1102, BIOC1103 ,PHYS1104, ANAT 1201 ,HIST 1202 ,BIOC1203, PHYS1204
Program offered the course	MBBS
Instruction language	English
Date of course approval	September 2022

Brief description	The course provides students with basic concepts of micro organism of clinical importance, specially their morphology, physiology, genetics, what diseases they cause, how transmission occurs and how it can be prevented. Also students are exposed to the structure and function of the immune system ,the health care associated infection and how to prevent them.
Course objectives	To provide essential knowledge of the principles of microbiology, infection control and immunology disciplines with emphasis on microbial structure and function, pathogenesis, classification, host–pathogen relationship, components (cells, tissues, antibodies and immunoglobulins) involved in host defense against infectious agents. – To understand the basic concepts of clinical immunology and its associated disorders. – To Acquire the fundamentals of medical microbiology laboratory skills – To interpret methods of detection of antibiotic resistance
duration	34 weeks
Methods of teaching	Lectures Tutorials Student presentations practical
Tools of assessment	Midterm exam (20%) Written, MCQs, quizzes, assignments. Final exam (80%).

	Written exam (50%) Practical (20%) Oral exam (10%)
references	Course handouts . Medical microbiology ,Jawetz Melnick &Adelberges, by KarenC.Carroll ,Janet Butel,Timothy Mietzner .

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.
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 cell structure (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.
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).
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. • Disinfectant (phenolics, halogens, quaternary ammonium compounds, diguanides, alcohols, aldehydes and chlorinated bisphenols).

• General characteristics of disinfectant. • Disinfectants /antiseptics properties. • Classification of disinfectants. • Application in medicine.
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. • Disinfectant (phenolics, halogens, quaternary ammonium compounds, diguanides, alcohols, aldehydes and chlorinated bisphenols). • General characteristics of disinfectant. • 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). • Principle of antimicrobial therapy.
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). • Principle 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.

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.
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.
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.
Molecules of immune system • Major histocompatibility complex molecules. • T cell receptor. • Antigens and antigen processing. • Antibodies and its role in immune system. • Monoclonal antibodies.
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
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
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
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
Replacement 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
• 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.

Parasitology Syllabus

Third year

Parasitology	
Course name	Parasitology
Code	PARA 1309
Course type	specialty
Accredited hours	4
Educational hours	204 hrs
Prerequisite requirements	All first and second year courses
Program offered the course	MBBCH
Instruction language	English
Date of course approval	2022
Textbooks required for this course	
Paniker textbook of medical parasitology	CK Jayaram Paniker
Atlas of medical parasitology	Shiba Kumar Rai et al
Academic journal	Journal Parasitology
Internet websites	www.pubmed.com
Course duration	
34 Weeks	
Delivery (Teaching and Learning Methods)	
• Formal Lectures • Practical sessions • Case studies, Group discussion & Assignments	

Course Objectives
• تعريف المصطلحات والمفاهيم العامة في علم الطفيليات. • تصنيف الطفيليات. الأوليات والديدان والحشرات الطبية • وصف التوزيع الجغرافي للطفيليات. • شرح الاشكال المختلفة للطفيليات الأولية والديدان والحشرات الطبية. • توضيح دورة حياة الطفيليات وتكاثرها وكيفية انتقال العدوي الطفيلية للإنسان. • شرح الإمراضية والتغيرات النسيجية والأعراض السريرية للأمراض الطفيلية. • شرح كيفية التشخيص والاختبارات المعملية والاختبارات الأخرى لتشخيص الامراض الطفيلية. • توضيح الأدوية العلاجات المناسبة المستخدمة في علاج الأمراض الطفيلية. • توضيح طرق الوقاية والمكافحة للأمراض الطفيلية. • شرح العوامل البيئية والبشرية التي تؤثر على انتشار الأمراض الطفيلية. • العوامل البيئية المؤثرة في معدل انتشار الأمراض الطفيلية وحدوث الأوبئة

Course Assessments				
Evaluation Method	Date	Marks 100	%	ILOs Assessed
Annual Work		**20**	**20 %**	
Mid-year Exam	January	**20**		Intellectual abilities, knowledge, and awareness
Quizzes & Assignments		**None**		
Final Exam	June	**80**		
Written		**40**		Intellectual abilities, knowledge, and awareness
Practical		**20**	**80%**	Awareness, understanding, and intellectual abilities Skills that are both practical and professional Skills that are applicable
Oral		**20**		

Evaluation Schedule:		
Evaluation		**Date**
Mid-term written exam:	It includes a varieties of questions; True & False questions & Best answers choice Questions/	January
Final written exam:	Multiple choice questions with case studies – Essay Questions Matching and complete the blanks	June
Practical exam.		June
Oral examination		June
Participation	Ddiscussions, assignments/ continuous assessment exam.etc.)	Daily-Monthly

1. General parasitology

1.1 Introduction to Parasitology:

1.1.1. Terms used in clinical parasitology.

1.1.2 Types of parasites.

1.1.3.Types of host.
1.2 Host parasite relationship. 1.2.1. Sources of Parasitic Infections. 1.2.2. Habitat of different parasites. 1.2.3 Life cycle of parasites.
1.3 Pathogenesis of parasitic infection
Classification of human Parasites. 1.4.1 Unicellularprotozoa. 1.4.2 Multicellular helminthes and arthropods
Classification of helminthes
General characteristic of nematodes. 1.6.1 Classification of nematodes according to their habitat.
Intestinal Nematodes:. 2.1.Ascaris lumbricoides. 2.1.1 Geographical distribution. 2.1.2 Habitat. 2.1.3 General morphology. 2.1.4 Life cycle. 2.1.5 Pathogenesis and clinical pictures. 2.1.6 Lab. diagnosis. 2.1.7 Treatment. 2.1.8 Control and prevention
Ancylostoma duodenale. 2.2.1 Geographical distribution. 2.2.2 Habitat. 2.2.3 General morphology. 2.2.4 Life cycle. 2.2.5 Pathogenesis and clinical pictures. 2.2.6 Lab. diagnosis. 2.2.7 Treatment. 2.2.8 Control and prevention
2.3 Necator americanus. 2.3.1 Geographical distribution. 2.3.2 Habitat. 2.3.3 General morphology. 2.3.4 Life cycle.

2.3.5 Pathogenesis and clinical pictures.

2.3.6 Lab. diagnosis.

2.3.7 Treatment.

2.3.8 Control and prevention

2.4 Trichostrongylus colubriformis (Pseudo Hookworm)

2.4.1 Geographical distribution.

2.4.2 Habitat.

2.4.3 General morphology.

2.4.4 Life cycle.

2.4.5 Pathogenesis and clinical pictures.

2.4.6 Lab. diagnosis.

2.4.7 Treatment.

2.4.8 Control and prevention

2.5 Strongyloides stercoralis.

2.5.1 Geographical distribution.

2.5.2 Habitat.

2.5.3 General morphology.

2.5.4 Life cycle

2.5.5 Pathogenesis and clinical pictures.

2.5.6 Lab. diagnosis.

2.5.7 Treatment.

2.5.8 Control and prevention

2.6 Larva Migrans

2.6.1 Geographical distribution.

2.6.2 Habitat.

2.6.3 General morphology.

2.6.4 Life cycle.

2.6.5 Pathogenesis and clinical pictures.

2.6.6 Lab. diagnosis.

2.6.7 Treatment.

2.6.8 Control and prevention

2.7 Trichinella spiralis

2.7.1 Geographical distribution.

2.7.2 Habitat.

2.7.3 General morphology.

2.7.4 Life cycle.

2.7.5 Pathogenesis and clinical pictures.

2.7.6 Lab. diagnosis.

2.7.7 Treatment.

2.7.8 Control and prevention

2.8Capillaria (philippinensis, hepatica, aerophila)

2.8.1 Geographical distribution.

2.8.2 Habitat.

2.8.3 General morphology.

2.8.4 Life cycle.

2.8.5 Pathogenesis and clinical pictures.

2.8.6 Lab. diagnosis.

2.8.7 Treatment.

2.8.8 Control and prevention

2.9 Enterobius vermicularis.

2.9.1 Geographical distribution.

2.9.2 Habitat.

2.9.3 General morphology.

2.9.4 Life cycle.

2.9.4 Pathogenesis and clinical pictures.

2.9.5 Lab. diagnosis.

2.9.6 Treatment.

2.9.7 Control and prevention

2.10 Trichuris trichiura

2.10.1 Geographical distribution.

2.10.2 Habitat.

2.10.3 General morphology.

2.10.4 Life cycle.

2.10.5 Pathogenesis and clinical pictures.

2.10.6 Lab. diagnosis.

2.10.7 Treatment.

2.10.8 Control and prevention

3.Filarial worm

3.1 Wuchereria bancrofti.

3.1.1Geographical distribution.

3.1.2 Habitat.

3.1.3 General morphology.

3.1.4 Life cycle.

3.1.5 Pathogenesis and clinical pictures.

3.1 6 Lab. diagnosis.

3.1.7 Treatment.

3.1.8 Control and prevention

3.2 Brugia malayi.

3.2.1 Geographical distribution.

3.2.2 Habitat.

3.2.3 General morphology.

3.2.3 Life cycle.

3.2.3 Pathogenesis and clinical pictures.

3.2.4 Lab. diagnosis.

3.2.5 Treatment.

3.2.6 Control and prevention

3.3 Loa loa.

3.3.1 Geographical distribution.

3.3.2 Habitat.

3.3.3 General morphology.

3.3.4 Life cycle.

3.3.5 Pathogenesis and clinical pictures.

3.3.6 Lab. diagnosis.

3.3.7 Treatment.

3.3.8 Control and prevention

3.4 Onchocerca volvulus.

3.4.1 Geographical distribution.

3.4.2 Habitat.

3.4.3 General morphology.

3.4.4 Life cycle.

3.4.5 Pathogenesis and clinical pictures.

3.4.6 Lab. diagnosis.

3.4.7 Treatment.

3.4.8 Control and prevention

3.5 Dracunculus medinensis.

3.5.1 Geographical distribution.

3.5.2 Habitat.

3.5.3 General morphology.

3.5.4 Life cycle.

3.5.5 Pathogenesis and clinical pictures.

3.5.6 Lab. diagnosis.

3.5.7 Treatment.

3.5.8 Control and prevention

3.6 Angiostrongylus cantonensis.

3.6.1 Geographical distribution.

3.6.2 Habitat.

3.6.3 General morphology.

3.6.4 Life cycle.

3.6.5 Pathogenesis and clinical pictures.

3.6.6 Lab. diagnosis.

3.6.7 Treatment.

3.6.8 Control and prevention

3.7 Ansakis

3.7.1 Geographical distribution.

3.7.2 Habitat.

3.7.3 General morphology.

3.7.4 Life cycle.

3.7.5 Pathogenesis and clinical pictures.

3.7.6 Lab. diagnosis.

3.7.7 Treatment.

3.7.8 Control and prevention

4.Trematodes.

4.1 Schistosoma(mansoni, japonicum , haematobium)

4.1.1 Geographical distribution.

4.1.2 Habitat.

4.1.3 General morphology.

4.1.4 Life cycle.

4.1.5 Pathogenesis and clinical pictures.

4.1.6 Lab. diagnosis.

4.1.7 Treatment.

4.1.8 Control and prevention

4.2 Fasciola (hepatica, gigantica)

4.2.1 Geographical distribution.

4.2.2 Habitat.

4.2.3 General morphology.

4.2.4 Life cycle.

4.2.5 Pathogenesis and clinical pictures.

4.2.6 Lab. diagnosis.

4.2.7 Treatment.

4.2.8 Control and prevention

4.3 Clonorchis Sinensis

4.3.1 Geographical distribution.

4.3.2 Habitat.

4.3.3 General morphology.

4.3.4 Life cycle.

4.3.5 Pathogenesis and clinical pictures.

4.3.6 Lab. diagnosis.

4.3.7 Treatment.

4.3.8 Control and prevention

4.4 Opisthorchis viverrini

4.4.1 Geographical distribution.

4.4.2 Habitat.

4.4.3 General morphology.

4.4.4 Life cycle.

4.4.5 Pathogenesis and clinical pictures.

4.4.6 Lab. diagnosis.

4.4.7 Treatment.

4.4.8 Control and prevention

4.5 Heterophyes heterophyes, Fasciolopsis buski, Paragonimus westermani, Metagonimus yokogawi

4.5.1 Geographical distribution.

4.5.2 Habitat.

4.5.3 General morphology.

4.5.4Life cycle.

4.5.5 Pathogenesis and clinical pictures.

4.5.6 Lab. diagnosis.

4.5.7 Treatment.

4.5.8 Control and prevention

5.Cestodes

5.1 General morphology of Cestodes.

5.2 Diphyllobothrium latum, Spirometra mansoni, Sparganosis.

5.2.1 Geographical distribution.

5.2.2 Habitat.

5.2.3 General morphology.

5.2.4 Life cycle.

5.2.5 Pathogenesis and clinical pictures. 5.2.6 Lab. diagnosis. 5.2.7 Treatment. 5.2.8 Control and prevention
5.3 Taenia (saginata, solium). 5.3.1 General morphology. 5.3.2 Life cycle. 5.3.3 Pathogenesis and clinical pictures. 5.3.4 Lab. diagnosis. 5.3.5 Treatment. 5.3.6 Control and prevention 5.4 Cysticercosis 5.4.1 General morphology. 5.4.2 Life cycle. 5.4.3 Pathogenesis and clinical pictures. 5.4.4 Lab. diagnosis. 5.4.5 Treatment. 5.4.6 Control and prevention
5.5 Echinococcus (granulosus, multilocularis) Hydatid disease 5.5.1 General morphology. 5.5.2 Life cycle. 5.5.3 Pathogenesis and clinical pictures. 5.5.4 Lab. diagnosis. 5.5.5 Treatment. 5.5.6 Control and prevention
5.6 Taenia multiceps, Coenurus, Hymenolepis nana, Hymenolepis diminuta, Dipylidium caninum 5.6.1 Geographical distribution. 5.6.2 Habitat. 5.6.3 General morphology. 5.6.4 Life cycle. 5.6.5 Pathogenesis and clinical pictures. 5.6.6 Lab. diagnosis. 5.6.7 Treatment. 5.6.8 Control and prevention
6.Introduction to Protozoa 6.1 Definitions and concepts related to protozoa.

6.2 Biology , Morphology and cellular structure of protozoa

6.3 Basic classification of protozoa.

6.4 Classification of protozoa according to their habitat

6.5 Pathogenic Amoeba.(Entamoeba histolytica, Dientamoeba fragilis, Naegleria fowleri, acanthamoeba)

6.5.1 Geographical distribution.

6.5.2 Habitat.

6.5.3 General morphology.

6.5.4 Life cycle.

6.5.5.Pathogenesis and clinical pictures.

6.5.6 Lab. diagnosis.

6.5.7 Treatment.

6.5.8 Control and prevention

6.6 Non pathogenic Amoeba

6.6.1 (Entamoeba hartmani, dispar, polecki, Endolimax nana, Iodamoeba bütschlii, gingivali)

Pathogenic flagellate.

7.1 Giardia lamblia, Trichomonas vaginalis.

7.1.1 Geographical distribution.

7.1.2 Habitat.

7.1.3 General morphology.

7.1.4 Life cycle.

7.1.5 Pathogenesis and clinical pictures.

7.1.6 Lab. diagnosis.

7.1.7 Treatment.

7.1.8 Control and prevention

7.2 Leishmania, Trypanosoma, Nonpathogenic flagellates

7.2.1 Geographical distribution.

7.2.2 Habitat.

7.2.3 General morphology.

7.2.4 Life cycle.

7.2.5 Pathogenesis and clinical pictures.

7.2.6 Lab. diagnosis.

7.2.7 Treatment.

7.2.8 Control and prevention

7.3 Balantidium coli, Plasmodium Malaria, Babesia

7.3.1 Geographical distribution.

7.3.2 Habitat.

7.3.3 General morphology.

7.3.4 Life cycle.

7.3.5 Pathogenesis and clinical pictures.

7.3.6 Lab. diagnosis.

7.3.7 Treatment.

7.3.8 Control and prevention

7.4 Toxoplasmagondii.Cryptosporidium,Cyclospora,Isospora.

7.4.1 Geographical distribution.

7.4.2 Habitat.

7.4.3 General morphology.

7.4.4 Life cycle.

7.4.5 Pathogenesis and clinical pictures.

7.4.6 Lab. diagnosis.

7.4.7 Treatment.

7.4.8 Control and prevention

7.5 Sarcocystis, Pneumocystis carinii

7.5.1 Geographical distribution.

7.5.2 Habitat.

7.5.3 General morphology.

7.5.4 Life cycle.

7.5.5 Pathogenesis and clinical pictures.

7.5.6 Lab. diagnosis.

7.5.7 Treatment.

7.5.8 Control and prevention

8. Introduction to medical entomology.

8.1 (Cyclops (copepods), Hard tick Ixodes, Soft tick Argasidae, Scorpions).

8.1.1 General definition.

8.1.2 Vector as a transmitter of pathogens.

8.1.3 Mechanical transmission.

8.1.4 Biological transmission.

8.1.5 Arthropods As Etiologic Agent of Diseases

8.1.6 Life cycle and metamorphosis of arthropods.

8.1.7 Classification of medical importance of arthropods.

8.1.8 General morphology of cyclop.

8.1.9 Medical importance.

8.1.10 Control and prevention.

8.2 Sarcoptes scabiei (Itching Mite), Demodex folliculorum (Hair Follicle Mite), House Dust Mite Dermatophagoide., Mosquitoes, Sandfly Phlebotomus, Fleas. 8.2.1General morphology. 8.2.2 Life cycle and metamorphosis. 8.2.3 Medical importance. 8.2.4 Diagnosis. 8.2.5 Treatment
8.3 House fly (Musca domestica), Myiasis, Lice, Bed bug Cimex, Stomoxys, Glossina, Chrysops 8.3.1 General morphology. 8.3.2 Life cycle and metamorphosis. 8.3.3 Medical importance. 8.3.4 Diagnosis. 8.3.5 Control and pervention
Revision
Revision
Revision

Obstetrics &gynecology

Syllabus Fourth year

Obstetrics &gynecology	
Course name	Obstetrics &gynecology
code	OBGY1410
Course type	speciality
Accredited units	18
Educational hours	208 hours
Prerequisite requirements	All basic sciences courses
Program offered the course	Bachelor of Medicine, Bachelor of Surgery
Instruction language	English
Date of course approval	September 2022

Brief descripition	The course is an eight weeks course, it allows the students to be exposed to the normal pregnancy and how antenatal care is provided ,and to know the complications of pregnancy. The students will have understanding of normal labor and required to attend and observe the normal labor and the care of the mother and baby. The student will become familiar of common gynecological problems including emergencies
references	Obstetrics by ten teachers. Gynecology by ten teachers . Fundamentals of Obs & Gyne. Illustrated text book of Obstetrics & Gynecology
Course duration	Eight weeks
Teaching methods	Lectures. Tutorials and case based discussions. Clinical training, in wards ,outpatient clinics ,labor room, operating theatre. Skills lab.
Course objectives	To acquire the knowledge about the basic sciences related to Obstetrics and Gynecology. - To be exposed to different problem and diseases of the pregnant woman. - To acquire the knowledge about the serious gynecological problems

	and disease. – To develop the basics knowledge of scientific research, communicate skills, counseling. – To be able to participate in health education of the public
Assessment tools	Written examination (MCQ, case scenarios, EMQ) (70_80) . Clinical examination, long and short cases And OSCE (70_ 100 marks) Oral examination. (0_30marks) Mid term exam and continous assessment(10_15%) Attendance 10 marks Skills lab exam 10 marks

BASIC OBSTETRICS AND GYNECOLOGY:

Anatomy, Embryology, Physiology of pregnancy, Biochemistry & molecular genetics, Physiology of menstruation, Diagnosis of pre 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.gnancy

4.2 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, Mal-position, mal-presentation, Instrumental delivery, Caesarian section, c/s hysterectomy, Prolonged pregnancy, IOL, Abnormal puerperal PLROM

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 & Curettage, Laparoscopy, hysteroscopy, colposcopy, Major gynecological surgery.

URO-GYNECOLOGY INCLUDING PELVIC RELAXATION

Utro-vaginal disease & prolapsed, Urodynamic, Urinary incontinence, Urinary fistula, Urinary retention.

GYNEONCOLOGY

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

TUTORIAL:

- The subjects of the tutorial are announced in a time table at the start of the course so allthe students know the subjects that will be discussed.
- The students would be divided into small groups from 15-30.
- The facilitator or coordinator will organize the discussion of the subject.
- The discussion would include all aspects of the subject including related anatomy, physiology, pathology, differential diagnosis, management plan. - The time of discussion should not exceed 45 minutes.
- The facilitator should organize the discussion and allow all students to participate. At theend of the tutorial the facilitator should summarize the subject. - The students should be encouraged to work as a team.
- The subject of the tutorial should be selected carefully and focused on clinical rather thantheoretical component

Family and community Medicine syllabus Fourth year

Family and community medicine	
Course name	Family and community medicine
Code	FAME 1413
Course type	specialty
Accredited hours	20
Educational hours	208 hours
Prerequisite requirements	All first ,second and third year courses
Programme offered the course	MBBCH
Instruction language	English
Date of course approval	September 2022

Brief description	It is an eight weeks course ,it provides students with an understanding of the physical ,psychological ,economic and environmental determinants of health and disease, the aspects of health promotion and education, it also allow students to acquire knowledge and skills in research methodology and biostatistical methods and epidemiological surveys .
Course objectives	• To be aware of the physical, social, psychological, economic, and environmental determinants of health and disease. • To be able to take a leadership role with other health care members in educating, motivating, supervising and leading them in health promotion, prevention and control of diseases. • To acquire knowledge and skills regarding statistical methods that can improve critical thinking, problem solving and decision making and enhances medical research. • To understand concept of preventive medicine and importance of community medicine in implementing community based disease prevention, cancer screening and health promotion programs. • To enable students to acquire Lifelong learning competencies required for continuous professional development • Apply the scientific, evidence-based approach to the practice of family and community medicine. • Apply an in-depth knowledge of the principles of family and community medicine. • Evaluates and applies knowledge related to health, psychological and environmental problems at the individual and community

	levels. • Apply knowledge of the pathological and clinical features of common diseases in family medicine. • Provides effective and safe evaluation and treatment for patients at the primary health care level – Uses effective communication skills with the patient. • Implement and evaluate strategies to maintain and promote health and prevent disease with patients and colleagues. • Apply the principles of lifelong education and continuous learning. • Assesses and implements the ethical and professional responsibilities required of the family and community physician. • Apply religious, legal and professional responsibilities. • Exchange the acquired knowledge and skills with colleagues, members of the health team and the community.
Duration	8 weeks
Methods of teaching	• Lectures • Tutorials • Clinical training • Field visits • Case based dissections • Writing research proposal
Tools of assessment	• Midterm exam (40marks) (20%) • Written exam: MCQs,EMQs, case studies. • Final assessment: (160 marks) • Written exam: MCQs, EMQs, fill the blanks • (80 marks) 40% • Practical exam 40 marks (20%) • Structured oral exam 30marks (15%) • Research proposal ,assignments and presentations 10 marks (5%)
references	Health and preventive medicine, Maxcy,Rosenau Park text book of preventive and social medicine, Banarsidas Bhanot_Jabalpur Rakel RE,Essentials of family practice medicine ,fundamentals and case studies . Handouts by the department .

Subjects	Hours per week.	Lecture (hours)	Clinical &Practical (hours)	Tutorial (hours)	Unites
Introduction in public health &epidemiology.	1	1	-	-	1
Definition & concept in public health & epidemiology.	2	2	-	-	**2**
Primary health care. Health education Health information system.					
School health services.	4	4	-	-	**4**
Demography & family planning.	6	4	**2**	-	**5**
Health planning & management	2	2	-	-	**2**
	4	2	**2**	-	**3**
	2	2	-	-	**2**
	4	2	**2**	-	**3**
Computer science	6	2	4	-	4
Medical statistic.	14	8	4	2	11
SPSS programme	5	3	1	-	4
Research methodology	12	6	6	-	9
Family medicine.					
Behavioral science.	10	6	2	2	8
	3	3	-	-	3
Principal of epidemiology & epidemiology methods.	10	6	2	2	8
Epidemiology of chronic non					

communicable diseases Screening	10	6	4	–	8
	5	3	–	2	4
Epidemiology of communicable Diseases.	25	15	10	–	20
Nutrition & health.	8	6	2	–	7
Vaccination & cold chain	5	3	2	–	4
Environmental and health.	12	10	2	–	11
Mother & child health.	3	2	1	–	3
Mental health.					
International health.	2	2	–	–	2
Disaster management.	2	2	–	–	2
Health care for the elderly, disabled & adolescents.	2	2	–	–	2
Occupational health	4	2	2	–	3
	12	6	6	–	9
					–
(open week) Task, field visits, problems solving & courses or other activity.	25	3	18	4	14

Ophthalmology syllabus

Fourth year

ophthalmology	
Course name	ophthalmology
Code	OPHT1411
Course type	specialty
Accredited hours	18
Educational hours	156 hours
Prerequisite requirements	All first, second and third year courses
Program offered the course	MBBCH
Instruction language	English
Date of course approval	September 2022

Brief description	The course aimed to provide students with understanding of the structure and function of the eyes ,to recognize and manage common ophthalmic conditions and emergencies
Course objectives	To understand, diagnose with fair degree of accuracy and be able to decide the line of management of common ophthalmic problems prevalent in Libya. To initiate the undergraduates to follow a systemic clinical approach by way of inquiring the clinical history, presenting symptoms and signs and clerking the case sheets; so that the common disease of the anterior of the eye like trachoma, spring catarrh, corneal ulcer, iritis; epidemic viral conjunctivitis etc. To diagnose correctly and properly treated and other anterior segment disorders of the lid; lacrimal sac and the lens, glaucoma are well recognized and referred to an established eye department – To know the various causes of visual loss sudden and gradual painful and painless in patient of different ages clinical entities requiring advanced investigation and specialized medical and/or surgical treatment, the undergraduate is made familiar with as to when such patient need the reference to consultants – To understand ocular trauma which is fairly common occurrence as road traffic accident trauma in and out of domestic

	life industrial accidents chemical burns training include the first aid and immediate therapy of such cases. - To teach students the use of ophthalmoscope so as to optically scan the media and learn the salient features of the normal eye fundus and are able to recognize common gross lesions of the posterior segment of the eye - To make students aware and whenever possible demonstrate advanced investigations like ultrasonography dacryocystography fluorescein angiography and use of laser therapy in ophthalmology - To know the role of genetics is explained in the transmission of familial diseases like congenital cataract congenital glaucoma squint developmental defects and how these may be averted by genetic counseling to the would-be parents
duration	Six weeks
Methods of teaching	Lectures. Tutorials Clinical training in wards, outpatient clinic, minor operating theatre Case presentations and assignments
Tools of assessment	Midterm exam 15% (30marks) Written exam Final exam (170)marks Written MCQs (70marks) Slides (40marks) or oral. Clinical, OSCE (60marks)
references	Kanski ophthalmology .

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 it'suse 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 Ant 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 6. DISEASES OF EYE LOSS –Applied anatomy and physiology, Development deformities epicanthus congenital photos Infections and inflammations of lids shy 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 Bechet s 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 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 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 F B (metal, glass, others), Investigation and localization of F B, 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 OR 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 Travis,Diane syndrome Marcus Gunn has winking 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 of,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 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 vitamin deficiency.

B- 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

Forensic medicine and Toxicology Syllabus

Fourth year

Forensic medicine and toxicology	
Course name	Forensic medicine and toxicology
code	FORM 1412
Course type	specialty
Accredited hours	22
Educational hours	112 hours
Prerequisite requirements	All first ,second and third year courses
Program offered the course	MBBCH
Instruction language	English
Date of course approval	**September 2022**

Brief description	The course extends for weeks, it provides students with knowledge and understanding of the medical ethics and malpractice, the medicolegal aspects of living and dead individuals, wounds and injuries, sexual offenses and forensic identification. Lt allow them to study toxicology, circumstances of intoxication, toxic doses, the clinical presentations, how to diagnose And the treatment available for various intoxications
Course objectives	To build the competencies of the undergraduate medical student to manage the medico-legal problems and situations that will face them after graduation during the medical general practice. To build the competencies of the undergraduate medical student to provide 1st aid management care for cases of poisoning that will face them after graduation during the general medical practice.
duration	Four weeks
Methods of teaching	Lectures Tutorials and case based dissections. Case presentations

	Practical sessions Demonstration, use of audiovisual materials and photos. Post mortem sessions in the mortuary
Tools of assessment	Midterm exam (15%), Quizzes, attendance, presentations and participation Final exam (75%) Written exam, MCQs, case scenarios (45_55%) Practical (10_20%) Oral exam (20%)
references	Simpson s forensic medicine,J.Payne_James ,R.Jones,S.Karch ,J.Manlove. Fundementals of forensic medicine and toxicology, R.Basu. Hadad clinical management of poisoning and over dose. Modern medical toxicology, V.V.Pillay. Color atlas of forensic medicine and pathology, Charles Catanese.

• 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 hemorrhages]. • 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 [bloodstain identification, blood grouping, medico-legal aspects of blood groups].

• Transportation injuries [different types, autopsy findings].

• Forensic Genetics [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 practice according 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].

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]

• Drugs and 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].

- 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.

Methods	Topic Hours	Hours
Riensch test or using the available instrument	detection of some heavy metals: mercury-arsenic & lead Animal poisons, etc…	3
Demonstration using either samples of natural plants or photos or audio-visual aids	some toxic plant samples, which include: ♦ Atropa belladona 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	4

	♦ Colocynth capsule and seeds. ♦ Castrol oil seeds. ♦ Croton oil seeds. ♦ Jalap root	
Demonstration of clinical toxicology using models.	Plastic model for adult and child for practice in toxicology of gastric lavage	2

Diagnostic and Therapeutic Radiology Syllabus

Fourth year

Diagnostic radiology and radiotherapy	
Course name	Diagnostic radiology and radiotherapy
Code	RADI 1414
Type of program	specialty
Accredited hours	16
Educational hours	88 hours
Prerequisite requirements	All non-clinical basic sciences courses
Program offered the course	MBBCH
Instruction language	English
Date of course approval	September 2022

Brief description	The course is a four weeks course. It exposes students to the different diagnostic imaging modalities in different body regions and systems , how to order them ,the contraindications and complications associated with imaging, the basic principles of reading common x-rays especially in emergencies. Students will have knowledge about interventional radiology and nuclear medicine. Also students will know about the role of radiotherapy in management of different cancers.
Course objectives	**OBJECTIVES OF THE COURSE:** - To acquire good basic knowledge in the various sub-specialties of radiology such as Neuroradiology, GI-radiology, Uro-radiology, Vascular-radiology, Musculoskeletalradiology, Interventional radiology, Emergency radiology, Pediatric radiology,Mammography,basics of radiotherapy ,basics of nuclear medicine. - To conduct and correctly interpret all routine and basic imaging investigations, basics of radiotherapy and nuclear medicine indications. - To provide radiological services in acute emergency and trauma

	including itsmedico-legal aspects. - To understand the impact of radiological investication on patient safety (byunderstanding the basics of radiation protection measures). - To know basic informations about the physics of the diagnostic imaging,radiotherapy and nuclear medicine machines. - To basically interact with other specialists so that maximum benefit to patientaccrues. 1. Understand the basic consepts of diagnostic imaging techniques and itsindications and contraindications including the MRI, CT, X RAY and US . 2. Understand basic concepts of radiology physix, radiation protection andpatient safety measures and risks of contrast media. 3. Understand a basic of radiology interventional proceduresincluding its indications and risks involved. 4. Understand the basic concepts of the nuclear medicine and to describe itsrole in treatment and follow up of common clinical conditions including thetumors. 5. Understand the basic consepts of the radiotherapy and to describe its rolein treatment of common tumors of different bony organs
Course duration	Four weeks
Methods of teaching	Lectures Tutorials Practical and clinical teaching
Tools of assessment	Final exam 100 marks Written ,MCQs ,EMQs ,case scenarios .(70 marks) Oral and images (30marks)
references	Getting started in clinical radiology from image to diagnosis ,George W.Eastman ,Christoph Wald ,Jane Crossin Course handouts .

1- CENTRAL NERVOUS SYSTEM IMAGING (3 Hours)

- Imaging pt. with CVA.
- Cerebral Infarction.
- Brain tumors and metastasis.
- Neurodegenerative diseases.
- Congenital disorders of the brain.
- C.N.S Infection.

2- FACE AND NECK IMAGING(2 Hours)

- Disease of the Nose and Sinuses.
- Disease of the Ears.
- Injuries and Diseases of the orbit
- Disease of the neck

3- CARDIOVASCULAR AND INTERVENTIONAL RADIOLOGY (2 Hours)

- Interventions in vascular disease.
- Tissue biopsies.
- Congenital heart disease.
- Coarcatation of Aorta and Aortic Dissection.
- *Imaging of Vascular disease*

4- CHEST RADIOLOGY (2 Hours)

- Analysis of chest radiograph.
- Opacities in the Lung.
- Acute Pulmonary changes.
- Chronic Lung disease.
- Lesions in the Mediastinum.
- Enlargement of the Hila.
- Pleural disease.

5- GENITOURINARY TRACT RADIOLOGY (2 Hours)

- Renal Ultrasound.
- Renal masses.
- Renal volume loss / Renal atrophy.
- Increase in renal volume.
- Renal calculi.
- Renal congenital anomalies.
- Renal trauma.

• Adrenal tumor.

6- GASTROINTESTINAL RADIOLOGY(3 Hours)

• 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.

7- Bone and Soft tissues imaging (2 Hours) Analysis of a bone image.

Disease of the Bone.

Disease of the Joints.

Fracture and Dislocation. Soft tissue tumors.

Imaging of spine disease.

7- Bone and Soft tissues imaging (2 Hours) Analysis of a bone image.

Disease of the Bone.

Disease of the Joints.

Fracture and Dislocation. Soft tissue tumors.

Imaging of spine disease.

8- OBSTETRICS AND GYNECOLOGY RADIOLOGY (1 Hour)

Obstetrics Ultrasound.

Gynecological disease.

Child pelvic mass.

9- RADIOLOGICAL ANATOMY (2 Hours) CNS anatomy.

• Chest anatomy.

• GIT and HBS anatomy.

10- RADIOLOGICAL PHYSICS (3 Hours)

• Conventional physics.

• MRI physics.

• CT physics.

• USS and Doppler physics.

• Radiation Protection.

B-RADIOTHERAPY

1- CNS Tumors

2- GIT Tumors

3- Lung Tumors

4- Genitourinary Tract and Pediatric tumors

5- Head and Neck Tumors

C- NUCLEAR MEDICINE

1- Physical principles of nuclear medicine

2- Commonly used nuclear medicine procedures (Bone scintigraphy, myocardial scintigraphy, Renal scintigraphy (dynamic and static), Hepatobilliary scintigraphy, Endocrine scintigraphy (Thyroid, Parathyroid and Adrena)

3- Radioactive iodine therapy for benign and malignant thyroid diseases.

D- DIAGNOSTIC RADIOLOGY

Imaging of bone tumor

Imaging of vascular disease

Analysis of Chest radiograph

Analysis of abdominal radiograph

Imaging Pt. 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 in congenital CNS disease

Imaging neck masses

MSK Anatomy

Opacities in the Lung

CLINICAL SKILLS

Syllabus Fourth year

Clinical skills	
Course name	Clinical skills
code	CS1415
Course type	specialty
Accredited hours	16
Educational hours	104 hours
Prerequisite requirments	Admission criteria and selection
Program offered the course	MBBCH
Instruction language	English
Date of course approval	September 2022

Brief course description	This course is devoted to enable students to develop clinical skills in a simulation setting, to get the confidence in performance of these skills, which allow them to apply in real life.
Course objectives	To be able to perform the basic skills in patients care on a simulator. To obtain the principle involved in each task and its normal and abnormal values. – To understand the importance of each skill in the context of clinical setting To introducing the student to the bases of clinical history and the fundamentals of clinical examination, To acquire practical experience on recording clinical history and will be trained on the physical examination process of both the respiratory system and cardiovascular system. To acquire practical experience on recording clinical history and will be trained on the physical examination process of both the respiratory system and cardiovascular system. To Introduce the students to the basis of surgical skills including wound management
Course duration	4 weeks
Methods of teaching	Lecturs

,learning and training	Practical ,to perform clinical examination and interventions on simulators Practice communication skills in a simulated environment.
Tools of assessment	Attendance 10% Continuous assessment and performance 15% Final written exam 25% Practical ,OSCE 50%.
references	Macleod clinical examination Browses introduction to symptoms and signs of surgical disease

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 node
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 history
4.2 cardiovascular system examinations
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

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

General Medicine & Special Medicine syllabus Fifth year

Medicine	
Course name	Medicine
code	MED1514
Course type	specialty
Accredited units	17
Educational hours	504 hours
Pre_requisite	All basic non clinical courses
Program offered the course	MBBCH
Instruction language	English
Date of course approval	September 2022

Brief Description	This course is an eighteen weeks course which involves teaching and training students in general medicine and medical subspecialties, which allow them to acquire knowledge and skills and attitudes In communication , assessment and management of patients presenting with medical problems .
references	➢ Davidson s principles and practice of medicine. ➢ Macleod clinical examination. ➢ Kumar and Clark clinical medicine
duration	18 weeks
Methods of teaching	➢ Lectures. ➢ Tutorials, case based dissections. ➢ Assignments ➢ Clinical training, bedside teaching, clinical rounds, outpatient clinics, emergency departments, endoscopy suite. ➢ Skills lab.
Assessment tools	➢ End of the fourth year introductory course (40marks) ➢ Continuous assessment (attendance, case presentations, participation, communication and attitudes) (20_ 30 marks) ➢ End of courses assessment (medical photos and

	images, (20_ 30 marks) ➢ Final exam (200_220 marks) ➢ Written exam (MCQ, case scenarios, data analysis). (80 marks) ➢ Clinical examination (short and long cases), OSCE. (100 marks) ➢ Oral examination .(20_40 marks)
Course objectives	➢ To acquire knowledge of 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. ➢ To acquire competent knowledge and skill in: ➢ Obtaining comprehensive problem- oriented history. ➢ Performing complete physical examination. ➢ Demonstrating problem –solving skills and pathophysiologic derangements to specific disease entities. ➢ To be able to suggest the proper line of investigation to reach a tentative diagnosis after enlisting relevant differential diagnosis. ➢ To produce a plan of management including most appropriate prescribed medications, their pharmacology, indications, dosage, side effects and toxic effects, ➢ To recognize the complications associated with the disease process. ➢ To recognize different factors, internal. External, familial, environmental, seasonal, endemic or otherwise and to plan preventions well as eradication measures

Rheumatic heart disease 2- Coronary heart disease 3- Arrhythmias

4- Cardiomyopathy 5- Infective endocarditis 6- Heart failure 7- Pericardial diseases
1- Inflammatory Bowel diseases 2- Small bowel diseases 3- GIT bleeding 4- Liver cirrhosis 5- Peptic ulcer disease 6- Esophageal diseases 7- Pancreatitis 8- Hepatitis
Multiple sclerosis 2- Parkinson disease and extra pyramidal disorders 3- C.V.A, Epilepsy and brain tumors HIV – 2- HIV-II 3- Extra pulmonary TB 4- CNS infection
Bronchial asthma Chronic obstructive lung diseases Pneumonia
Tuberculosis Interstitial lung diseases Bronchogenic carcinoma Pleural diseases Pulmonary function test
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
Systemic lupus erythematosus Rheumatoid arthritis Systemic sclerosis Inflammatory muscle diseases Vasculitis syndromes
Acute kidney injury Chronic renal failure Secondary hypertension (renal causes) Glomerulonephritis and nephrotic syndrome
Anemia Leukemia and lymphoma Plasma cell disorders Bleeding disorders
Acid– base balance Mineral metabolism Toxicology Cellular hematology Body fluid analysis
Tumor markers Endocrine test I (thyroid + parathyroid) Endocrine Test II(pituitary + Adrenal) Introduction and term definitions Schizophrenia &related disorders
PSYCHIATRY 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
DERMATOLOGY&VENEREOLOGY
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
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
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

History

Examination

History of psychosomatics

Psychosomatics disorders

Treatment of psychosomatics disorders ▪ S/E of psychiatric drugs

History and examination in dermatology.

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)

The cutaneous manifestation of C.T.D(SLE&Dermatomyositis)

Cutaneous manifestation of scleroderma

Discoid lupus erythematosus

Candidiasis

Management of lichen planus

D/Dof hypopigmentation

Leishmaniosis types &management

Nail disorders (deferential diagnosis)

D/D of coma

D/D of acute chest pain

Medical causes of acute abdominal pain

Use of Seng–Staken tube

Endotrachea lintubation (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).
Patient with jaundice Bloody diarrhea Constipation. Dyspepsia . Gait disorders , patient with headach , localization of CNS lesions Pyrexaia of unknown origin Polyurea and polydipsia .obesity,weight loss. Painfull joints ,recurrent mouth ulcers . Anurea and oligurea , hematurea and proteiurea. Anemia, lymphadenopathy, bleeding tendency, blood transfusion. Patient with wheeze ,chronic cough ,dyspnea ,sleep breathing problems Syncope ,cardiogenic shock ,palpitation , Lower limb edema , CPR ECG

Pediatrics Syllabus

Fifth year

pediatrics	
Course name	pediatrics
Code	PAED1516
Course type	specialty
Accredited hours	15
Educational hours	288 hours
Prerequisite requirements	All basic sciences courses and forth year courses
Program offered the course	MBBCH
Instruction language	English
Date of course approval	September 12022

Brief description	To provide students with the knowledge of normal and abnormal growth and development and their clinical applications from birth to adolescence ,and to know about common childhood diseases and emergencies
Course objectives	To support acquisition of basic knowledge of normal and abnormal growth and development (physical, physiologic, psychosocial), and its clinical application from birth through adolescence. To enable students to provide basic health care for individuals in the Pediatric age group (neonates, infants, children and adolescents). To provide students with an appropriate background covering the common and important Pediatric emergencies and diseases. To enable the development and application of appropriate professional attitudes, communication and problem solving skill
Duration	12 weeks
Methods of teaching	Lectures Tutorials, case based discussions Student presentations Clinical training in wards ,neonatal department ,outpatient clinics ,emergency department

Tools of assessment	Midterm exam (20marks) Written exam,MCQs ,case scenarios Final exam (180 marks) Written exam (70 marks) Paper I MCQs, EMCs Paper II clinical scenarios and data analysis Practical exam, long and short cases, OSCE (80 marks0 Structured oral examination (30 marks)
references	Nelson text book of pediatrics, Robert Kliegman, etal. Course hand outs

NEONATOLOGY:

(1) THE NORMAL NEOBORN: Normal care of newborn baby, the components of the APGAR score, neonatal resuscitation, benign abnormalities seen in newborn, neonatal screening programs

(2) NEONATAL SEPSIS: The risk factors for infection in the newborn, related mortality and morbidity, common symptoms and signs, management plan and prevention methods 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

(3) 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 hyperbilirubinaemia.

(4) NEONATAL SEIZURES: Common causes of neonatal seizures, subtle seizures, investigations and the steps to control seizures and treating causes

(5) NEONATAL RESPIRATORY PROBLEMS: Clinical presentation of respiratory distress in neonates, differential diagnosis of common causes of RD, investigations & treatment based on the history & examination.

(6) HAEMORHAGIC DISEASE OF NEOBORN: Causes of bleeding in newborn, vitamin K prophylaxis, presentation and complications of vitamin K deficiency bleeding, management of bleeding in the newborn.

(7) INFANT OF DIABETIC MOTHER & ELECTROLYTES IMBALANCE IN NEONATES:

(8) BIRTH TRAUMA AND COLD INJURY: – Risk factors for birth trauma, common birth trauma and their management, The neutral thermal environment, methods of heat loss in newborn, risk factors, clinical picture, complications and management of hypothermia.

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.

RESPIRATORY SYSTEM

CHILDHOOD ASTHMA: The pathogenesis of asthma, common presentation, important features in history (including environmental factors) andexamination 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

GASTROENTEROLOGY

(1) 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 .

(2) CHRONIC DIARRHOEA: Definition of chronic diarrhea, common causes of chronic diarrhoea (Celiac, giardiasis, toddler's diarrhea, CMPI), principles of management of common causes.

(3) 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.

(4) 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).

(5) CONSTIPATION: 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.

V. 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) ADRENAL GLAND DISORDERS (HYPO & HYPER): The function of the adrenal gland and its important hormones, common causes for hypoadrenalism/ hyperadrenalism, clinical features of each, investigations for adrenal function.

(3) GROWTH AND PUBERTY (DELAYED/ PRECOCIOUS): Normal growth stages (including pubertal stages), normal variants of pubertal development, definition of delayed and precocious puberty, causes of delayed puberty and common causes of precocious puberty, investigations plan for precocious puberty.

(4) NORMAL GROWTH/ SHORT STATURE: Growth assessment, 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.

(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) 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

(7) 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.

VI. HAEMATOLOGY AND ONCOLOGY

(1) A CHILD WITH PALLOR (ANEMIA): Common types (nutritional, hemolytic and aplastic) of anemia, types of nutritional anemia, clinical features & diagnosis and treatment of iron deficiency anemia.

(2) LEUKAEMIA: Pathogenesis and basic classification of leukemia, modes of presentation of childhood acute leukemia, differential diagnosis of leukemia, investigations of a child with suspected leukemia, principles of management acute lymphoblastic leukemia.

(3) 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.

(4) CHILD WITH JAUNDICE AND PALLOR (HAEMOLYTIC ANEMIA):
differentiating the different types of pallor, types of hemolytic anemia, to diagnose hemolytic anemia in general & each type of hemolytic illness, principles of management of common hemolytic anemia.

(5) 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.

VII. 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 forRenal Biopsy.

(2) 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 &bacteruria, management of UTI, complications of renal scaring.

(3) CHRONIC KIDNEY DISEASE (CKD): Definition of CKD, common causes in children, clinical manifestations and complications of CKD, general management plan for CKD.

(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) 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.

VIII. 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, suspectition of meningitis and encephalitis, contraindications for lumbar puncture, principles of treatment of meningitis, common complication of meningitis.

(3) 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).

(4) 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.

(6) LARGE HEAD / SMALL HEAD / MENINGOMYELOCELE: Head size measurement method and definition of microcephaly and macrocephaly, common causes of micro- and

macrocephaly, clinical manifestations and impact of microcephaly and hydrocephalus, types and management of hydrocephalus, relationship between hydrocephalus and Spinabifida, effects of neural tube defect on other parts of the body.

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 fordiagnosis 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.

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.

XI. EMERGENCIES

(1) 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.

(2) THE YOUNG PERSON WITH POISONING / SELF HARM: Approach acutely poisoned child, understanding self harm& accidental poisoning, identifyingpredisposing factor, incidence, classical clinical manifestations, management and prognosis of poisonings like(Organophosphorous &Hydrocarbons& Iron&carbon monoxide poisoning&

corrosive (alkaline and acid)& Paracetamol and aspirin.

(3) ANAPHYLAXIS: Definition and common causes of anaphylaxis, clinical presentation an management d of anaphylaxis, measures to avoid recurrence.

XII. INFECTIOUS DISEASES

(1) 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.

(2) 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.

(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) PROTOZOAL INFECTIONS: Epidemiology, typical clinical features, investigations management and prognosis of common protozoal infections in children (Amebiasis& Giardiasis& Malaria& Leishmania).

(5) 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.

(6) 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.

XIII. GENERAL

(1) 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

(2) THE FEBRILE CHILD: - The mechanism of fever production and control in infants and young children, proper way of temperature measurement, common causes of fever (including common causes of fever without an obvious focus), relevant features of the clinical examination, relevant investigations and management options.

(3) 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.

(4) 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

XIV. SOCIAL AND PREVINTIVE PEDIATRICS - 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.

XV. 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.

XVI.BEHAVIOR

(1) CHILD WITH NEURODEVELOPMENTAL DISORDERS : Definitionof 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.

1. GIT bleeding. 2. GERD.
3. Inflammatory bowel disease. 4. Bed wetting.
5. Headache. 6. Floppy infant.
7. Drug prophylaxis in pediatrics. 8. Idiopathic thrombocytopenic Purpura.

9. Abdominal pain.	10. Henoch Sholein Purpura.
11. In born error of metabolism.	12. Renal tubular acidosis.
13. Birth trauma.	14. Acute weakness.
15. Food allergy.	16. Pyloric stenosis
17. Congenital hip dislocation.	18. Congenital infection.
19. Neonatal screening.	20. Hypernatremic dehydration.
21. Obesity.	22. Small for gestational age.
23. Hemophilia	24. Benign neonatal conditions.
25. Iron deficiency anemia.	26. Rickets

I. Respiratory Skills

1- Auscultation training of lung.

2- Delivery of Medications via Nebulizer and MDI& Oxygen delivery methods.

3- Basic respiratory function tests PFM.

II.Cardiovascular Skills

1- Auscultation training of heart sounds

2-Interpreting the 12- leads ECG By using Mannequin.

3-Scenario SVT

III.Pediatric Emergency Skills

1 - Newborn resuscitation.

2- Septic Shock

3- Scenario management of Acute Asthma.

General & Special Surgery

Syllabus Fifth year

General surgery	
Course name	General surgery
Course code	SURG 1515
Course type	specialty
Accredited units	17
Educational hours	504 hours
Pre_rquisite requirements	All basic non clinical courses
Program offered the course	MBBCH
Instruction language	english
Date of course approval	September 2022

Brief description	The course aims to allow medical students to study and be trained in the general surgery and the main subspecialties of surgery to know about the common surgical problems their epidemiology ,causes, presentations ,how to diagnose and treat them, and to develop skills in taking history and communicate with patients and their families ,and how to carry out clinical examination and assessment of patients with professional standards and ethics
references	Principles and practice of surgery by ,O.James Garden, Andre.W.Bradbury…John.L.Forsyth. Baily,and Love…short practice of surgery. By, Norman S. Williams … Christopher Bulstrod…P.Ronan. O. Connell Browse introduction to symptoms and signs of surgical disease Adam ,outline of fractures,David Hamblen
Course duration	18 weeks
delivery	Lectures ,tutorials, case based dissuctions and scenarios, case presentations, clinical training and skills lab
Course objectives	At the end of the course the students will be able to: 1)recognize the common surgical conditions and surgical emergencies , their

	Aetiology, epidemiology, presentations ,assessment ,management and complications. 2)aquire the necessary professional and ethical skills for the practice of surgery 3)to communicate effectively with patients ,their carers, colleagues and rest of the surgical team. 4)to practice patient centered care and involvement of patients in decisions about their treatment and care 5)to practice problem solving approach , and evidence based medicine. 6)keep the patient safety and well being his first concern. 7)understand the principles of preoperative preparation and post operative care. 8)carry out basic surgical interventions and basic life support. 9)recognize the effect of diseases on patients ,families and society, and role of surgery in life saving ,treatment of disease and amelioration of suffering 10) learn the importance oh health promotion ,disease prevention and early detection and screeining of diseases.
Course assessment	1)Attendance , case presentations, performance and attitudes during the course 2)MSQ examination at end of the course 3)casescenarios and problem solving questions 4) clinical examination, OSCE or traditional long case and short cases. 5) structured oral examination
Attendance criteria	As required by the bylaws of the faculties of medicine students should attend at least 75% of lectures and tutorials and 90% of clinical training

Week 1	1. course introduction. 2.medical ethics,consent ,professional standards. 3.teamwork,patient safety and medical ducomentation. 4. wounds,wound healing, management of wounds. 5. fluids and electrolytes insurgical patients.
Week 2	1.hemostasis types of hemorrhage, blood and blood products in surgery. 2.surgical infections I :health care associated infections(HAI), surgical site infections, use and mis use of antibiotics 3)surgical infections II : skin infections , gas gangrene , tetanus, synergestic gangrene. 4)surgical infections III :specific infections ,TB , leprosy, syphilis hydatid disease , parasitic infections of surgical importance. 5) sterilization and disinfection ,use of antiseptics.
Week 3	1)shock ,types, pathophysiology management of hypovolemic shock. 2) sepsis syndrome and septic shock. 3)metabolic response to surgery and trauma . 4) nutrition in surgical patients . 5) preoperative preparation and post operative complications .
Week 4	1) evidence based medicine and surgical audit. 2)principles of surgical oncology, epidemiology ,causes ,grading ,staging,tumor markers, diagnosis ,treatment ,follow up ,,prognosis ,precancerous conditions , early detection ,screening and prevention. 3)venous thromboembolism ,DVT and pulmonary embolism. 4)palliative care. 5)global surgery and health promotion.
Week 5	1)disaster, war surgery and triage. 2)management of patients with multiple trauma. 3)abdominal injuries . 4) chest injuries . 5)vascular injuries and compartment syndrome.

Week 6	1) head injuries, 2) spinal injuries . 3) principles of fractures and dislocations, causes, types,diagnosis and complications . 4)principles of fracture treatment. 5) burns
Week7	1) salivary gland diseases. 2)benign diseases of esophagus, injuries ,perforation, neuromuscular disorders ,diverdiculae ,hiatus hernia. 3)benign and malignant tumors of esophagus . 4)benign diseases of stomach and duodenum. 5)gastric carcinoma ,duodenal tumors
Week 8	1)gall bladder anatomy ,diseases. 2)obstructive jaundice. 3)liver infections , cysts and benign tumors 4) liver tumors,tumors of gall bladder and biliary tree 5)portal hypertension .
Week 9	1)diseases of the pancreas ,acute pancreatitis ,chronic pancreatitis, pancreatic cysts. 2) carcinoma of pancreas,endocrine tumors of the pancreas. 3) diseases of the spleen,spleenomegally ,indications and complications of spleenectomy. 4)diseases of the small bowel,tumors ,intussusception ,Meckeles diverticulum ,infections of terminal ileum. 5)inflammatory bowel disease.
Week 10	1)acute appendicitis ,tumors of the appendix. 2)colorectal carcinoma. 3)diverticular disease of the colon,colonic infections of surgical importance. 4) ischemic colitis, radiation proctitis ,IBS ,polyps of colon and rectum. 5)intestinal obstruction.
Week 11	1)anal carcinoma and warts. 2)perianal conditions ,piles ,fissure and ulceration 3) peri anal infections , abscess ,fistula and pilonidal sinus . 4) rectal prolapsed , fecal incontinence ,and pelvic dysfunction syndrome.

	5)peritonitis and intraperitoneal sepsis.
Week 12	1) diseases of the mesentry, omentum and retroperitoneum. 2)abdominal wall hernias and diseases of the umbilicus. 3)upper gastro intestinal bleeding. 4)lower gastro intestinal bleeding . 5)volvulus of sigmoid and peudoobstruction of the large bowel
Week 13	1) peripheral vascular disease. 2)aneurysms . 3)acute limb ischemia ,critical limb ischemia and gangrene 4) vascular diseases of upper limb, thoracic outlet syndrome and vasospastic conditions . 5)diabetic foot disease.
Week 14	1) varicose veins , postphlebtic leg and venous ulceration. 2)diseases of the lymphatic system, lymphadenopathy ,malignancy and lymphedema 3)vascular malformations and arteiovenous fistulas. 4)lumps of skin and subcutaneous tissue. 5) malignant skin tumors.
Week 15	1) thyroid diseases I. 2) thyroid diseases II 3)parathyroid diseases ,disorders of calcium metabolism. 4) diseases of adrenal gland other endocrine disorders. 5)management of abdominal masses in infancy and childhood.
Week 16	1) benign diseases of the breast.diseases of male breast. 2) carcinoma breast. 3)tracheo_esophageal fistula, congenital pyloric stenosis. 4)intestinal obstruction in infancy and childhood. 5) anorectal anomalies, congenital megacolon and constipation in children.
Week 17	1)surgical emergencies in infancy and child hood. 2)diseases of the mediastinum ,infections,cysts tumors and superior venacaval obstruction. 3)pleural diseases,empyema ,chylothorax and tumors of pleura. 4)surgical aspects of carcinoma lung. 5) lung abscess ,bronchioectasis , hydatid cyst of lung and tuberculosis of

	lungs.
Week 18	1) organ transplantation . 2) instruments , surgical photos and x_rays . 3) exam orientation. 4) replacement lecture. 5) replacement lecture.

TUTORIALS IN GENERAL SURGEY	
Week 1	1)communication skills. 2)history ,examination, formulation of management plan. 3)fluid therapy in surgical patients ,types of fluids and calculation of needs. 4)hemorrhage , hypovolemia and blood transfusion. 5)acute abdomen.
Week 2	1) preop preparation and post op care. 2)dysphagia. 3)abdominal swelling. 4) jaundiced patient . 5)case scenarios ,case based discussions.
Week 3	1) alteration of bowel habit. 2) inguinoscrotal swelling and DD of groin swellin. 3)intestinal obstruction . 4)breast lumps ,discharge and pain . 5) case scenarios.
Week 4	1) acute perianal pain. 2)acute swelling of the limb. 3) wounds and ulcers . 4)case scenarios, case based discussions. 5)upper and lower GIT bleeding.
Week 5	1) neck swelling. 2) acute limb pain. 3)solitary thyroid nodule. 4) case scenarios , case based discussions. 5) student presentations.

Week 6	1) chronic abdominal pain. 2)neonatal and childhood emergencies. 3)instruments and x_rays 4)student presentations. 5) case scenarios.

LECTURES and TUTORIALS IN ORTHOPEDICS	
Week 1	1) introductions to fractures and dislocations and principles of treatment. 2)complications of fractures and dislocations. 3)history and examination of an orthopedic case. 4) fractures and dislocations around the shoulder,and arm. 5) fractures and dislocations around the elbow and forearm. 6)fractures and dislocations around wrist and hand 7) student presentations
Week 2	1) back pain and spinal deformities. 2) bone and joint infections . 3)injuries of spine. 4) fractures and dislocations around the hip ,fractures of femur. 5) knee injuries. 6)fractures and dislocations around ankle and foot 7) neuromuscular disorders. 8) student presentations
Week 3	1)muscloskeletal tumors 2) congenital anomalies (DDH,foot deformities etc.) 3)hip conditions and DD of limping child. 4)non infective arthritis. 5)metabolic bone disease. 6) student presentations 7) bone and joint imaging

TUTORIALS and LECTURES IN ENT	
Week 1	1)History and examination of an ENT case. 2)anatomy of the ear, symptoms of ear diseases, acute otitis media ,external ear conditions. 3)chronic otitis media and its complications . 4)assessment of hearing and balance , vertigo and Menier s disease. 5)deafness.
week 2	1) anatomy of nose and sinuses , nasal trauma, allergy and polyps. 2) Epistaxis . 3) tumors of the nose and paranasal sinuses. 4)diseases of the nasopharynx , adenoids ,tumors and post nasal dripping. 5)oropharynx , hypopharynx , acute tonsillitis ,peritonsillar abscess and tumors. 6) student presentations.
Week 3	1) larynx ,anatomy and diseases. 2)tracheostomy . 3)acute airway obstruction in adults and children. 4) upper airway infections and rhinosinusitis. 5)student presentations.

LECTURES and TUTORIAL IN urology	
Week 1	1) urological history ,investigation and instruments . 2)specific and non-specific UTI. 3) scrotal swelling and DD of acute scrotal pain. 4)urogenital trauma . 5) urological imaging. 6)urinary retension 7)urinary catheterization, and operative urology 8)student presentations
Week 2	1) Hematurea and urolitheal tumors. 2) prostatic tumors.

	3) upper and lower obstructive uropathy. 4) urolithiasis. 5)maldescended testis and male infertility. 6)renal tumors 7)urinary incontinence 8)congenital anomalies of the urinary tract . 9) student presentations

TUTORIALS IN ANESTHESIA AND INTENSIVE CARE	
Week 1	1)preoperative assessment and preoperative investigations. 2)pharmacology of anesthesia. 3) monitoring. 4) general anesthetic techniques, controlled ventilation. 5)fluid and acid base balance. 6)blood transfusion 7)CPR. 8)post-operative complications. 9)pain management I . 10) Pain II.
Week 2	1)critical care I 2) critical care II. 3)critical care III. 4) Airway management. 5) Circulatory support. 6) Patient transfer. 7) Regional and central anesthesia. 8) recovery room, 9) instrumentation and technique. 10) Student presentations.

TUTORIALS IN PLASTIC SURGERY	
Week 1	1) burns I&II. 2)wound healing. 3)maxillofacial anomalies and trauma. 3)hand trauma and developmental anomalies . 4)skin tumors. 5) reconstructive surgery.

TUTORIALIS INNEUROSURGERY	
Week 1	1)head injuries I&II . 2) spinal injuries . 3) congenital anomalies of the spine. 4) brain tumors and space occupying lesions 5) degenerative disease of the spine.