SYLLABUS AND CURRICULUM

TIME DISTRIBUTION AND TRAINING PERIOD

As already stated, every student shall undergo a period of study extending over 4 ½ academic years divided into 9 semesters of 6 months each from the date of commencement of his/her study for the subjects comprising the medical curriculum to the date of completion of examination and followed by one year compulsory rotating internship. The period of four and half years is divided into three phases as follows:-

Phase-1 (2 semesters) – consisting of Pre-clinical subjects (Human Anatomy, Physiology including Bio-Physics, Biochemistry and introduction to Community Medicine including Humanities). Besides 60 hours for introduction to Community Medicine including Humanities, rest of the time shall be somewhat equally divided between Anatomy and Physiology plus Biochemistry combined (Physiology 2/3 and Biochemistry 1/3)

Phase-II (3 semesters) – consisting of para-clinical/clinical subjects.

During this phase teaching of para-clinical and clinical subjects shall be done concurrently.

The para-clinical subjects shall consist of Pathology, Pharmacology, Microbiology, Forensic Medicine including Toxicology and part of Community Medicine.

The clinical subjects shall consist of all those subjects detailed under Phase III.

Out of the time for para-clinical teaching approximately equal time be allotted to Pathology, Pharmacology, Microbiology and Forensic Medicine and Community Medicine combined (1/3 Forensic Medicine and 2/3 Community Medicine).

Phase-III (continuation of study of clinical subjects for 7 semesters after passing Phase-1)

The clinical subjects to be taught during Phase II and III are Medicine and its allied specialties, Surgery and its allied specialties, Obstetrics and Gynaecology and Community Medicine.

Admission process will be initiated in such a way that teaching in first semester starts by 1st of August each year.

OUTLINES OF SYLLABI FOR M.B.B.S. 1ST PROFESSIONAL CURRICULUM (SUBJECT-WISE)

Pre-clinical subjects - Phase I: In the teaching of these subjects stress shall be laid on basic principles of the subjects with more emphasis on their applied aspects.

ANATOMY

Goal

The broad goal of the teaching of undergraduate students in Anatomy aims at providing comprehensive knowledge of the gross and microscopic structure and development of human body to provide a basis for understanding the clinical correlation of organs or structures involved and the anatomical basis for the disease presentations.

Objectives:

A) Knowledge:

a) At the end of the course the student should be able to

b) Comprehend the normal disposition, clinically relevant interrelationships, functional and cross sectional anatomy of the various structures in the body.

c) Identify the microscopic structure and correlate elementary ultra-structure of various organs and tissues and correlate the structure with the functions as a prerequisite for understanding the altered state in various disease processes.

d) Comprehend the basic structure and connections of the central nervous system to analyse the integrative and regulative functions of the organs and systems. He/She should be able to locate the site of gross lesions according to the deficits encountered.

e) Demonstrate knowledge of the basic principles and sequential development of the organs and systems, recognise the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards.

He/She should be able to explain the developmental basis of the major variations and abnormalities.

(B) Skills :

At the end of the course the student should be able to:

a) Identify and locate all the structures of the body and mark the topography of the living anatomy.

b) Identify the organs and tissues under the microscope.

c) Understand the principles of karyotyping and identify the gross congenital anomalies.

d) Understand principles of newer imaging techniques and interpretation of Computerised Tomography (CT) Scan, Sonogram etc.

e) Understand clinical basis of some common clinical procedures i.e., intramuscular & intravenous injection, lumbar puncture and kidney biopsy etc.

(C) Integration

From the integrated teaching of other basic sciences, student should be able to comprehend the regulation and integration of the functions of the organs and systems in the body and thus interpret the anatomical basis of disease process.

SYLLABUS

General Anatomy:

- Anatomical positions, planes & terms.
- Functions of skin & fasciae.
- Classification & structure of the bones.
- Parts & blood supply of long bones.
- Classification & structure of cartilages.

- Classification of joints with examples for each class/type.

General Histology :

- Cell: Naming the parts of eukaryotic cell and the organelles, structure and functions of nucleus, mitochondria, endoplasmic reticulum and cilia.
- Epithelial tissues.
- Connective tissues (inclusive of cartilage and bone)
- Exocrine glands.
- Muscles: Types.
- Nervous tissue: Nerve, spinal and sympathetic ganglia.

Integumentary System:

- Dermatomes, cutaneous nerve supply of the whole body.
- Microanatomy: Skin and its appendages.

Blood, Reticuloendothelial and Immune Systems:

Main groups of Lymph nodes

- Structure
- Location
- Areas of drainage.

General Embryology and Genetics:

- Gametogenesis, fertilization, implantation.
- Menstrual cycle.
- Ist three weeks of human development, germ layers and their derivatives, foldings.
- Determination, differentiation and morphogenesis, foetal membranes and connecting stalk.
- Organogenesis.
- Acquisition of external body form and growth.
- Twinning.
- Formation, structure and functions of placenta.
- Teratology.

- Common genetic terms and symbols used in pedigree chart.
  Mendelian principles, single gene and multifactorial pattern of inheritance.
- Chromosome - Morphology and classification
- Aberrations of chromosomes: Down's, Turner's and Klinefelter's syndrome.
- Sex determination and hermaphrodites.

Thorax:

- Thoracic vertebrae, ribs and sternum.
- Intervertebral disc : Gross features and applied aspects.
- Intercostals spaces : Muscles, vessels and nerves.
- Bony cage of thorax : Inlet and outlet, applied aspects with reference to deformities in various diseases.
- Diaphragm.
- Trachea, bronchial tree and bronchopulmonary segments : Gross and applied.
- Pleura and lung : Gross and applied.
- Microscopic structure of lung and tracheobronchial tree.
- Development of pleura, lung and tracheobronchial tree.
- Divisions of mediastinum and their contents.
- Oesophagus : Extent, relations, normal constrictions, blood supply, nerve supply and lymphatic drainage.
- Thymus - Gross anatomy and development.
- Heart : Pericardium, chambers, blood supply, nerve supply, Internal structure and conducting system.
- Microscopic structure of heart and blood vessels.
- Development of various chambers of the heart.
- Major blood vessels and their distribution.
- Development of major arteries and veins.
- Congenital anomalies of heart and major vessels.
- Foetal circulation and changes at birth.
- Thoracic aorta, internal thoracic, intercostals arteries.
- Azygos and hemiazygos veins

Superior vena cavae.

Abdomen :

- Muscles of anterior abdominal wall and rectus sheath.
- Inguinal canal : Gross features and their clinical importance.
- Peritoneum
- The mesentery, lesser omentum and greater omentum.
- Stomach and duodenum: Gross features, vasculature, innervation, Lympathic drainage and applied anatomy.
- Regional differences between small and large intestine.
- Appendix : Gross, blood supply and applied anatomy.
- Pancreas : Disposition, relations, blood supply, development and applied anatomy.
- Rectum and anal canal : Gross features, relations vasculature, innervation, Lymphatic drainage and applied anatomy.
- Microscopic structure, Oesophagus, stomach, duodenum, jejunum, ileum, Appendix, colon and pancreas.
- Development of GIT and its congenital anomalies.
- Liver, gross anatomy, lobes, peritoneal relations, visceral relations, blood supply.
- Gall bladder, bile duct and hepatic portal system - Gross anatomy.
- Microscopic structure of liver and gall bladder.
- Development of hepatobiliary system and its congenital anomalies.
- Spleen : Gross anatomy, relations, development.
- Gross Anatomy : Kidney: Size, shape, relations, blood supply, vertical section (gross internal structures).
  - Ureter, urinary bladder and urethra.
- Development: Kidney, ureter, urinary bladder and urethra.
- Microanatomy: Kidney, ureter and urinary bladder.
- Adrenal gland: Gross features, histology and vasculature.
- Male Reproductive System :

  Scrotum, epididymis, seminal vesicle, spermatic cord and penis

Gross and microscopic features and applied anatomy - testis, vas deferens and prostate.

Development - male genital system and its anomalies.

- Female Reproductive System :
- Uterus & vagina - Gross, blood supply, lymphatic drainage, age changes, supports and applied anatomy, broad ligament.Gross features□ovary, fallopian tube and external genitalia.
- Breast morphology, structure and lymphatic drainage, development and age changes.
- Microscopic structure□ovary oviduct, uterus, cervix, vagina and breast.
- Development – Female genital system and its congenital anomalies.
- Importance of levator ani muscle in connection with pregnancy, defaecation and micturition.
- Lumbar and sacral plexus: Formation, branches and applied aspects.
- Lumbar vertebrae and skeletal pelvis : Types, features, sex differences.
- Abdominal aorta.

  External and internal iliac arteries.
- Inferior vena cava and portal system.

Central Nervous System:

- Introduction to nervous system, neuron and neroglia.
- Sympathetic and parasympathetic system-craniosacral outflow, sympathetic chain.
- Spinal cord: Naming the contents of vertebral canal., Meanings of spinal cord
- Extent, gross and surface features, blood supply and applied anatomy
- Diagram of transverse section at cervical level showing the position of major

  tracts and applied anatomy of the tracts.

  Origin, termination and modality carried by:

  Cortico-spinal tracts Spino-thalami tracts
  Posterior column tracts Spino-cerebellar tracts.
- Base of brain: Surface attachments of cranial nerves.

- Mid-brain, pons and medulla: External features, cross section and blood supply.
- Cerebellum: Gross features, connections, blood supply and histology.
- Hypothalamus and thalamus: Main nuclei and main connections.
- Epithalamus and metathalamus: Parts and functions.
- Cerebrum: Sulci and gyri, fibre bundles, functions, blood supply, histology.
- Ventricular system and circulation of cerebrospinal fluid.
- Basal nuclei: Parts and major connections of corpus striatum.
- Extrapyramidal system: Parts and functions.
- Limbic system: parts and functions.
- Development of nervous system.

Upper Limb

- Boundaries, contents and applied aspects of axilla, cubital fossa, Anatomical snuff box and carpal tunnel.
- Type, subtype, attachments of capsule and ligaments, movements, muscles involved, blood supply, nerve supply and applied aspects of:

  Shoulder joint Elbow joint
  Radio-ulnar joint Wrist joint
  1st carpo-metacarpal joint
- Shoulder girdle, sterno-clavicular and acromio-clavicular joints: Movements
- Fascial spaces in the palm and their applied aspects.
- Side determination, parts, immediate relations.

  Capsular attachments and blood supply of the following bones:

  Clavicle Scapula

  Humerus Radius Ulna
- Identification of bones in an articulated hand.
- Axillary lymph nodes: Subgroups, relations and applied aspects.
- Muscles: Origin, insertion, nerve supply and actions of-

Pectoralis major & minor Deltoid, Trapezius, serratus anterior, Latissimus dorsi Biceps brachii, Brachialis Pronator teres
Supinator and adductor pollicis Flexor and Extensor compartments asgroups
Lumbricals and interossi

- Nerves
  Brachial plexus - Its formation, parts, branches and applied aspects
  Origin, root value, course, termination and applied anatomy of-
  Axillary Radial
  Median Ulnar

- Arteries: Origin, course, termination and branches of-
  Axillary Brachial
  Radial Ulnar arteries
  Palmar arches

- Veins:
  Basilic and cephalic veins Formation, tributaries and termination
  Median cubital vein - position and applied anatomy

- Identification of structures in scapular region and hand

Lower Limb:

- Boundaries, contents and applied aspects of:
  Femoral triangle, Femoral sheath and hernia, adductor canal and pepliteal fossa

- Thigh and leg: Compartments and their contents

- Identification of structures in the gluteal region, sole and dorsum of foot

- Type, subtype, capsular attachments, naming the ligaments, movements, Muscles involved, nerve supply, blood supply and applied aspects of:

  Hip joint Knee joint
  Ankle joint Subtalar joint

- Articuled foot : Naming the bones and major attachments

- Arches of foot: Formation, supports and applied anatomy
- Side determination, parts, immediate relations, attachments of capsule and ligaments and blood supply of the following bones:
  Hip bone Femur
  Tibia Fibula
  Patella
- Lymph nodes
- Inguinal and popliteal groups subgroups,
  Their afferents, efferents and applied aspects
- Muscles :
  Origin, insertion, nerve supply and action of-
  Gluteus maximus and medius
  Triceps surae
  Psoasmajor, Iliacus, Sartorius
  Biceps femoris
  Semimembranosus
  Adductor group Rectus fe moris ,Popliteus, Tibialis anterior and posterior
  Peroneus longus, Gastrocnemius, Soleus Long flexors and extensors

- Nerves: Origin, root value, course, branches and applied aspects of-
  Sciatic Common peroneal
  Tibial Femoral
  Obturator Superficial and deep peroneal
- Arteries: Origin, course, termination and branches of- Femoral
  Popliteal
  Arteria dorsalis pedis Peroneal
  Anterior & posterior tibial Plantar arch
- Veins:
  Origin, termination, tributaries and applied aspects
  of- Long and short saphenous veins
  Popliteal and femoral veins
  Varicose veins and ulcers-mention

Head & Neck :

- Gross anatomy of oral cavity including palate, salivary glands and tongue
- Dental formula
- Development of tongue and palate and developmental basis of cleft palate
- Microscopic structure of tongue and salivary glands
- Pharynx: Gross features, walls, muscles, relations and innervation
- Tonsil - Gross anatomy, blood supply, lymphatic drainage, applied aspect and development
- Scalp: Layers, blood supply, nerve supply and applied anatomy
- Meninges of brain: Layers and functions
- Dural venous sinuses
- Identification: Muscles of facial expression with reference to facial paralysis
- Anterior and posterior triangles: Boundaries and contents
- Nasal cavity: Gross - conchae, meati, bony walls, formation of septum, blood supply, nerve supply and applied anatomy
- Paranasal air sinuses: Gross-site, opening, applied anatomy
- Larynx: Gross-cartilages, main muscles, movements of vocal cords, internal features and nerve supply
- Pituitary and pineal glands: Gross, applied and vasculature
- Thyroid and parathyroid glands: Gross, vasculature and applied anatomy Microanatomy : Pituitary, thyroid, parathyroid
- Cervical group of lymph nodes:
  Subgroups, drainage areas and their applied aspects
- General and special features of the following bones:
  Skull - various normas, cranial fossae and mandible
  Cervical vertebrae
  Temporo mandibular joint: Type, subtype, capsular attachments, naming the ligaments, movements, muscles involved, blood supply, nerve supply and applied aspects
- Naming the type, subtype, ligaments, movements and applied aspects of
  Atlanto-occipital joint
  Atlanto-axial joint

- Muscles: Origin, insertion, nerve supply and actions of the following-

  Sternocleidomastoid Orbicularis oculi
  Buccinator Muscles of mastication

Scalenus anterior Digastric
(Reference to be made in relation of scalenus anterior syndrome)

- Cranial nerves: Origin, route and supply
- Special senses :
  Ear External ear parts, direction and applied aspects
  Middle ear and internal ear parts and applied aspects
  Eye Gross structure, fascial coverings of eyeball and uveal tract and blood supply
  Extraocular muscles list and discuss their individual and group movements
  Eyeball microscopic structure –cornea and retina

- Arteries:
  Origin, course, termination and branches of the following Common, external and internal carotid arteries

- Veins:
  Formation, tributaries, termination and applied aspects of the following
  Internal jugular vein
  Facial vein

- Derivatives of pharyngeal arches
- Development of face and major anomalies (cleft lip, cleft palate)
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Radiological anatomy

- Identification of normal anatomical features in plain skiagrams
- Identification of normal anatomical features in Barium meal and enema
  Bronchography, ascending and descending pyelography, Hysterosalpingography, Cranio-angiography, Cardio-angiography
- Basic principles of M.R.I. & CT scan

Cross-sectional anatomy

- Identification of anatomical structures on a provided section at the following vertebral levels:

C5, C7, T2, T4, T7, T10, T12, L1, L5, S3

- Cross-sectional anatomy of limbs at representative levels

***Book Recommended* :**

(i) Cunningham's Manual of Practical Anatomy Volume I, II, III.

(ii) Text Book of Anatomy, Vol. I, II, III by Inderbir Singh

(iii) Human Genetics by S.D. Gangane

(iv) Langman's Medical Embryology by T.W. Sadler

(v) Difiore's Atlas of Histology by V.P. Erischenko

PHYSIOLOGY

GOAL

The broad goal of the teaching of undergraduate students in Physiology aims at providing the student comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

ii) OBJECTIVES

a) KNOWLEDGE

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

(1) explain the normal functioning of all the organ systems and their interactions for well coordinated total body function.

(2) assess the relative contribution of each organ system to the maintenance of the milieu interior.

(3) elucidate the physiological aspects of normal growth and development.

(4) describe the physiological response and adaptations to environmental stresses.

(5) list the physiological principles underlying pathogenesis and treatment of disease.

b) SKILLS

At the end of the course the student should be able to :

(1) conduct experiments designed for study of physiological phenomena.

(2) interpret experimental/investigative data.

(3) distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

c) INTEGRATION

At the end of the integrated teaching the student should acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

(B) BIOPHYSICS

(a) **GOAL & OBJECTIVES :** The broad goal of teaching Biophysics to undergraduate students is that they should understand basic physical principles involved in the functioning of body organs in normal and diseased conditions.

Total time for teaching Biophysics = 5 hours

Out of which : 1. Didactic lectures = 3 hours

2. Tutorial/group discussion = 1 hour

3. Practical = 1 hour

(b) Topic distribution

(1) Lectures :

(i) Physical principles of transport across cell memberanes and across capillary wall.

ii) Biopotentials.

iii) Physical principles governing flow of blood in heart and blood vessels.

Also physical principles governing flow of air in air passages.

2. Tutorial/group discussion: On the topic covered in didactic lectures.

3. Practicals:

Demonstration of :

a) Biopotential on oscilloscope

b) Electro Encephalogram (EEG)

c) Electro Myelogram (EMG)

d) Electro Cardiogram (ECG)

SYLLABUS

Basic Concepts

- Introduction :
  General functional organization of human body.
  Cell-organelles and their functions
  Cell to cell and local communications
- Body fluid compartments : Define and explain.
- Homeostasis: Definition, maintenance, control of internal environment, different regulatory systems in homeostasis
  Principles of control systems :
  General characteristics and components of biological control systems
  Concept of negative and positive feedback
  Correction, error and feedback gain
- Hormonal control mechanism: Definition of hormones, receptors and target cells
  Role of hormones in homeostasis
- Neural control mechanism: Role in homeostasis
- Terminology: Stimulus, excitability, conductivity, contractility, refractory period, chronaxie, rheobase, summation etc.
- Bioelectricity : Functional anatomy of neurons
- Resting membrane potential, Nernst equation
  Action potential and its ionic basis
  Receptor - Generator potential, properties and transduction
  Synapses - Ultrastructure, properties, synaptic plasticity, neurotransmitters and mode of transmission.

Autonomic Nervous System

- Autonomic organization of nervous system: Review
- Functional organization of nervous system: Divisions, Distribution and functions
- Higher control of autonomic nervous system
- Physiological role of autonomic nervous system

Blood, Reticuloendothelial and Immune Systems

- Blood as a body fluid: Composition and functions of blood Plasma: Normal constituents.
- Plasma proteins : Types, concentrations, properties & functions
- Blood cells : Types, distribution and overview of haematopoiesis
  Erythrocytes Morphology, functions, fate, normal count, PCV, ESR, fragility, haemolysis
  Erythropoiesis Definition, stages and regulating factors
  Blood indices and their clinical usefulness
  Leucocytes Classification and morphology, normal counts, functions and development Platelets - Morphology and functions.
- Blood groups : Agglutinogens and agglutinins, Landsteiner's law, ABO and Rh groups Blood transfusion - relation of blood groups, indications, hazards and storage of blood Inheritance, erythroblastosis foetalis & hemolytic disease of the new born
- Haemostasis: Physiology of coagulation, tests for clotting, clot retraction, fibrinolysis and anticoagulation
- Reticuloendothelial system: Functions of spleen and lymph nodes
- Lymph and tissue fluids: Formation and functions

Respiratory System

- Functional anatomy of respiratory system:
- Mechanics of breathing: Movements of thoracic cage during respiration, muscles involved and their nerve supply,
  Intrapleural and pulmonary pressure and volume changes,
  Pressure - volume inter- relationships
  Lung compliance Surfactant, airway resistance, work of breathing
- Spirometry : Lung volumes & capacities: Definitions, normal values and significance
- Pulmonary circulation: Functional anatomy, distribution, factors influencing and special features
- Pulmonary gas exchange: Alvcolocapillary membranes, diffusion capacities, Partial pressure gradients and factors influencing diffusion of gases, measurement of diffusion capacity using carbon monoxide
  Applied physiology - shunt and alvcolocapillary block
  Ventilation - Perfusion ratio and its importance in respiratory diseases
- Gas Transport:
  Oxygen transport Factors influencing the combination of haemoglobin with oxygen, oxygen dissociation curve plotting, features, physiological advantage of its shape, factors affecting its shift and Bohr effect
  Carbon dioxide transport tissue uptake, carriage in blood and release at the lungs
  Importance of red blood cell, chloride shift, role in acid-base balance Haldane effect
- Regulation of respiration: Neural control-medulla, ports and vagus
  Chemo-receptors-peripheral and central, chemical and non-chemical Influences on respiration, integrated responses
- Respiration in unusual environments: High altitude hypoxia and space flight
  Deep sea driving-nitrogen narcosis
  Hyperbaric oxygen and oxygen toxicity
  Abnormal breathing: Apnoea, hypernoea, tachypnoea, dyspnoea,
  Cheyane-stokes breathing, and Biot's breathing Definition, features and physiological basis
- Artificial respiration: Definition, types, principles, indications, advantages and disadvantages.

Cardiovascular System

- Heart as a mechanical pump: Design of systematic and pulmonary circulation Introduction of the terms - pressure, flow and resistance Type of blood vessels and their functions Properties of myocardial cells:
  Site of generation of cardiac impulse-pacemaker
  tissue mechanisms of spontaneous generation of
  impulses, specialized conducting system and its
  importance, electrical properties of working
  myocardial cells,
  molecular basis of contraction and excitation contraction coupling (in brief)
  All or none phenomenon, length-tension relationships, Frank-Starling Law,
  neural influences, effect of ions and chemicals on myocardial contractility
- Cardiac cycle: Mechanical and electrical events, Pressure-volume relationship
- Electrocardiography: Definition, uses, principle, waves and their explanations

Renal Electrolyte System

- Introduction : Nephron - divisions of nephron and its functions Processes involved in urine formation
  Role of kidney in homeostasis
  Renal circulation - pressure profile, peculiarities and its functional significance
- Glomerular filtration: Definition, mechanism and factors influencing G.F.R; methods of measurement, its physiological importance and variations
- Tubular functions:
  Mechanisms of reabsorption and secretion of electrolytes and other substances
  Countercurrent mechanism
  Water excretion-mechanisms of concentration, dilution and water diuresis
- Micturition: Definition
  Nerve supply of urinary bladder and its control
- Cystometrogram: Principle

Endocrines and Metabolism

- Introduction to Endocrines: Definition of hormones, classification, general mechanism of action and concept of second messengers.
- Hypothalamus: Role of hypothalamus and concept of hypothalamo-hypophyseal system
- Anterior pituitary: List the hormones.

- Growth hormone - Release, functions and regulation of secretion and disorders
- Posterior pituitary: List the hormones
  Vasopressin – Physiological actions, mechanism of action, regulation of release, hyperactivity and hypoactivity - clinical symptoms
- Thyroid Gland: Review the biosynthesis of 13 and 14
  Physiological effects, mechanism of action, regulation of release and
  Consequences of hypo and hyper thyroidism
    - Calcium and phosphorous metabolism: Brief outline Vitamin D-review source, synthesis and metabolism Regulation and physiological effects.

  Parathyroid hormone - physiological effects and mechanism of action
  Integrated role of parathormone, thyrodcalcitonin and vitamin D (review)
  Regulation of release and consequences of hypo and hyper parathyroidism
  Calcitonin - Source, secretion, metabolism, physiological effects, mechanism of action, regulation of Release and consequences of hypo and hyper secretions.
- Adrenal Cortex:
  Glucocorticoids - names of harmones, physiological effects, mechanism of action, regulation of secretion, consequences of hyper and hypo secretion
  Mineralocorticoids□names of harmones, physiological effects, mechanism of action, regulation of secretion, consequences of hyper and hypo secretion
  Sex-corticoids□names of hormones, physiological effects, effects of excess, secretion Summary of the effects of adrenocortical hyper and hypo functions
- Adrenal medulla: Review the physiological actions of epinephrine
- Stress: Physiological mechanisms for coping up with it
- Endocrine Pancreas: Enlist the hormones
  Insulin - Review sites of synthesis, secretion, transport and metabolism,
  Regulation of release and mechanism of action,
  Physiological effects and consequences of deficiency and excess
  Glucagon-review secretion, transport and metabolim,
  Physiological effects, mechanism of action and regulation of secretion
  Insulin-glucagon molar ratio and its importance
- Pineal Gland: Naming the hormone secreted, actions and clinical importance ECG recording techniques
- Cardiac output: Definition, normal values and variations,
  Major determinants of cardiac output and regulation
  Heart-lung preparation - measurement of cardiac output,
  Fick's principle and it application,
  Indicator dye methods of measurement

Regulation of heart rate and stroke volume

- Haemodynamics: Definition of terms - pressure, flow, resistance, velocity etc.
  Laminar and turbulent flow, Poiseuille law,
  Factors affecting blood flow and resistance, critical closing pressure
  Various types of circulation of local regulation of blood flow to tissues
- Arterial Blood Pressure : Definition, normal value, variations, measurement,
  Mean arterial pressure (MAP) and its determinants
  Short term reflex control- baroreceptors and their significance
  Mechanism of reflex control and its limitations
  Long term control - Renal body fluid-pressure control mechanism
- Regional circulation: Coronary, cerebral, cutaneous, splanchnic and foetal Normal values, special features and regulation
  Cardiovascular changes during exercise

Gastrointestinal System

- Introduction to gastrointestinal Physiology: Functions of GI system-individual parts
  Innervation of the gut, regulation of GI functions - general overview
- Oral Cavity: Mastication and digestion in mouth and its importance
  Salivary secretion mechanism, composition, functions and regulation
- Physiology of deglutition: Definition, stages and neural control
- Stomach: Overview of functions
  Physiology of gastric secretion - Mechanism, composition, function and control
  Experimental procedures to elucidate and phases of gastic secretion Gastric motility characteristics and control gastric emptying and antral pump mechanism.
- Pancreatic secretions: Functions and control
- Small intestine: Secretion, movements and control
- Large intestine: Functions
- Gastrointestinal hormones and their role in secretomotor functions of the gut
- Physiology of vomiting and the reflex mechanism involved
- Defaccation: Mechanism and control
- Physiology of vomiting, diarrhoea, constipation

Hepatobiliary System

- Liver: Functions
  Entero hepatic circulation
  Bile formation, secretion and regulation
  Physiological basis of liver function tests.
- Gall bladder: Functions
  Mechanism and regulation of gall bladder contraction
  Oral cholecystography
  Neuroglia - Types, morphology, functions: classification of nerves
- Signal transmission in the nervous system: Review
  Graded potential Definition, characteristics and physiological significance
  Resting membrane potential ionic basis
  Action potential definition
  Ionic basis for electrical, chemical and excitability changes
  Propagation, mechanism and factors influencing the same
- Response of neurons and nerve fibers to injury: Types of injuries Types of changes - Wallerian degeneration and regeneration, factors influencing regeneration
- Microenvironment of the neuron: Blood brain barrier and its importance
- Synapse: Definition and types
  Structure and mechanism of transmission
  Neurotransmitters and their properties
- Sensory receptors: Definition, classification and properties.
- Reflexes : Definition and classification
  Reflex arc and stretch reflex
  Properties of reflexes and their clinical significance
- Somato-sensory system:
  Classification and characteristics of different sensations
  Sensory pathways and regulation at the higher level
  Physiology of pain including referred pain
- Control of posture and movement:
  General Principles of organization of motor control
  Effects of complete transection and hemisection of spinal cord
  Descending pathways involved in motor control-
  Corticospinal (pyramidal) system and
  Corticobulbar (extra pyramidal) system
  Cortex, basal ganglia and cerebellum-motor control and their disorders
- Reticular formation: Definition connections and functions Physiological basis of consciousness and sleep
- EEG: Evoked potentials and their clinical significance

- Hypothalamus: Components, connections and functions
- Thalamus: Components, connections, functions Thalamic syndrome
- Limbic system: Components, connections and functions
- Prefrontal lobe: Components, connections and functions Effects of lesions
- Higher cortical functions:
  Learning, memory, judgement, language and speech
- Visual System:
  Structure of eye and overview of functions
  Structure and function of cornea
  Aqueous humor□Formation, circulation and drainage
  Intraocular pressure and functions
  Optics of vision□image forming mechanism
  Pupil and its functions
  Light reflex and accommodation
  Binocular and monocular vision
  Common errors of refraction
  Visual acuity and visual fields□clinical importance.
  Ophthalmoscopy, retinoscopy and perimetry
  Photo receptors - distribution, visual pigments and their functions
  Light and dark adaptation: photopic and scotopic vision

Reproductive System

- Introduction: Sexual differentiation and development
- Male reproductive system :
  Primary and accessory organs and their functions
  Spermatogenesis and its regulation
  Testoterone - Transport, metabolism, mechanism and physiological actions
  Control of testicular function□Feedback mechanism and abnormalities
- Female reproductive system:
  Physiology of menstrual cycle:
  Ovarian cycle Uterine cycle Vaginal and cervical cycle
  Physiology of ovulation and its detection
  Ovarian hormones—
  Estrogen and Progesterone - Physiological actions and mechanism of action
  Control of overian function - Feedback mechanism, menopause and abnormalities
- Physiology of fertilization and implantation
- Physiology of pregnancy: Endocrine changes, fecto-placental unit, changes in mother during pregnancy, tests for pregnancy

- Physiology of parturition: Role of oxytocin
- Physiology of lactation: Role of oxytocin and prolactin

Growth Development and Genetics

- Growth and development: Definition
  Physical growth - pienatal period, birth to puberty, pubertal growth, skeletal age and physical maturity
  organ growth - Differential growth of specific organs and tissues (brain, head, lymphoid tissue, visceral & reproductive organs at various ages) Growth spurts in human's life - infancy and late puberty.
  Growth rates in boys and girls, mental growth and IQ
  Factors influencing growth - genetic, nutritional and hormonal
- Disorders of normal growth:
  Abnormalities of foetal and postnatal growth
  Hereditary short stature
- Physiology of ageing:
  Changes in various systems and mechanisms involved Factors affecting ageing

Integumentary System

- Skin: Functions
- Sweat glands: Types, secretion and functions
- Thermoregulation: Mechanism, receptors
  Hypothalamic thermostat
  Acclimatization
  Disorders of thermoregulation

Central nervous-System and Special Senses

- Introduction: Organization of the nervous system
  The structural and functional unit of nervous system
  Neurons - Types, functional components and morphology
  Visual pathway - Transduction, transmission, synaptic modulation and visual cortex.
  Effects of transection of visual pathway at various levels
  Eye movements
  Neurophysiological basis of fixation of gaze and conjugate movements
  Physiology of colour vision - theories and electrophysiological aspects Colour blindness - classification and tests

- Audiotory System:
  Functional anatomy of ear and general properties of sound External ear - Functions
  Middle ear - Functions of tympanic membrane and ossicles, mechanism of sound transmission, impedance maching, function of custachian tube
  Internal ear - Structure and function of cochlea, Sound transduction, electrical potentials from cochlea, pitch and intensity discrimination
  Auditory pathway Receptive fields and tonotopic maps, binaural interactions, nerve pathway from the cochlea to the auditory cortex.
  Organization of auditory cortex and functions, sound localization
  Deafness : Types, tests, to diagnose deafness (*practicals*)
  Audiometry and its clinical applications
- The Vestibular System: Structure of labyrinth
  Vestibular transduction response to rotational and linear acceleration
  Central vestibular pathway
  Vestibulo-ocular reflex and its clinical importance
  Clinical tests for vestibular integrity, disorders of labyrinth
- The Olfactory System: Location of receptors and pathways, physiology of olfaction and disorders of olfactory sensation
- The Gustatory System : Location of receptors and pathways
- Physiology of gustation and disorders of gustatory sensation**.**

Practical

The students must know at the end of the practical –

I. Haematology

1. Preparation and staining of blood films : Identification of blood cells in a stained film: total and differential leucocyte count : estimation of haemoglobin : fragility of red blood cell : erythrocyte sedimentation rate, haematocrit value: blood grouping : bleeding and clotting time.

2. Laboratory classification of anaemias and determination of absolute indices like MCH, MCHC, MCV, colour index, Cook- arneth count.

Demonstration only: Enumeration of reticulocyte and platelets

II. Experimental Physiology

1. Amphibian Experiments : Nerve- muscle physiology

Study of laboratory appliances in experimental physiology; Frog's gastroenaemius-sciatic muscle nerve preparation : simple muscle curve : effects of increasing strength of stimuli: effects of temperature : genesis of fatigue: effects of two successive stimuli : genesis of tetanus: effects of afterload and free load on muscle contraction and calculation of work done.

Cardiovascular System

Experimental cardiogram : Effect of warmth and cold on sinus venosus and ventricle : extra systole and compensatory pause: properties of cardiac muscle effect of acetylcholine, adrenaline.

2. Mammalian Experiments

Demonstration only: Recording of intestinal movements (rabbit) and effect of drugs, ions and temperature**:** perfusion of isolated rabbit's heart and effect of drugs and ions.

III Human Experiments

Cardiovascular System: Clinical examination of cardiovascular system, sphygmomanometry: effect of exercise and posture on blood pressure, radial pulse, cold-pressure test. Cardiac efficiency test using jogger.

Respiratory System : Pulmonary function tests including spirometry : Clinical examinations of respiratory system: stethography, respiratory response to exercise.

GIT: Examination of abdomen

Special Senses

Perimetry, acuity of vision- distant and near: colour vision: tests of smell and taste: tuning fork tests.

Nervous System : Examination of motor functions, sensory function and cranial nerves:

examination of reflexes of normal subject.

General Physical Examination : In normal subjects

Demonstration only

- Pregnancy test, ECG, Recording on Physiograph/Polyrite of EMG, EEG, Phono Cardiogram, Pulse, Respiration, Temperature

- Principles of ophthalmoscopy

- Recording using 16 channels data acquisition system EEG, EMG, Nerve conduction, evoked potential, GSR

- Diet Chart - Normal, pregnancy, diabetes, hypertension, obesity

- BMR using Benedict Roth spirometer

- Computerized pulmonary function tests using Medspiror.

Non-Conventional Teaching Tools

- Departmental quizafter completion of teaching of each system
- Computer experiments on nerve muscle physiology, normal blood pressure and heart rate and effect of various drugs on it.
- Seminars on different topics allocated.

Vertical Orientation Programme

After completion of teaching of each system, students are taken to respective clinical departments for acquainting them with latest diagnostic procedures TMT Holter, Echo-Cardiography, Pulmonary function test, audiometery, retinoscopy, dialysis endoscopy, Barium swallow, Barium meal/Barium enema, blood transfusion.

Undergraduate medical projects: The students are given topics for preparing projects after getting the latest/recent advances available through internet search.

Text Books

(i) Text book of Medical Physiology by A.C. Guyton

(ii) Review of Medical Physiology by W.F. Ganong

(iii) Understanding Medical Physiology by R.L. Bijlani

(iv) Practical Physiology by C.L. Ghai

Reference Books

(i) Physiological Basis of Medical Practice, Best and Taylor

(ii) Practical Physiology by V.G. Ranude

(iii) Clinical Methods by Hutchinson

(iv) The Central Nervous System Structure and Function by Per Brodal

BIOCHEMISTRY

Biochemistry including medical physics and Molecular Biology.

i) **GOAL**

The broad goal of the teaching of undergraduate students in biochemistry is to make them understand the scientific basis of the life processes at the molecular level and to orient them towards the application of the knowledge acquired in solving clinical problems.

ii) OBJECTIVES

a) KNOWLEDGE

At the end of the course, the student should be able to :

(1) describe the molecular and functional organization of a cell and list its subcellular components;

(2) delineate structure, function and inter-relationships of biomolecules and consequences of deviation from normal;

(3) summarize the fundamental aspects of enzymology and clinical application wherein regulation of enzymatic activity is altered;

(4) describe digestion and assimilation of nutrients and consequences of malnutrition;

(5) integrate the various aspects of metabolism and their regulatory pathways;

(6) explain the biochemical basis of inherited disorders with their associated sequelae;

(7) describe mechanisms involved in maintenance of body fluid and pH homeostasis;

(8) outline the molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in medicine;

(9) summarize the molecular concepts of body defence and their application in medicine;

(10) outline the biochemical basis of environmental health hazards, biochemical basis of cancer and carcinogenesis;

(11) familiarize with the principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of a given data;

(12) the ability to suggest experiments to support theoretical concepts and clinical diagnosis.

b. SKILLS:

At the end of the course, the student should be able to :

(1) make use of conventional techniques/instruments to perform biochemical analysis relevant to clinical screening and diagnosis;

(2) analyze and interpret investigative data;

(3) demonstrate the skills of solving scientific and clinical problems and decision making;

c. **INTEGRATION**

The knowledge acquired in biochemistry should help the students to integrate molecular events with structure and function of the human body in health and disease.

SYLLABUS

Eukaryotic Cell Structure

Cellular compartments – cellular environment - organization and composition of eukaryotic cells, functional role of sub cellular organelles and membranes.

Physicochemical principles and techniques :

Osmosis, diffusion, dialysis, surface tension, Donnan equilibrium, colloids, radioisotopes.

Carbohydrate Chemistry

Definition, classification and nomenclature of carbohydrates, structure of glucose, biological importance and properties of glucose, fructose, galactose, lactose, maltose, sucrose, heteropolysaccharides, carbohydrates of cell membranes.

Lipid Chemistry

Definition, classification, nomenclature of lipids, biological importance and properties of saturated and unsaturated fatty acids, triacylglycerol, phospholipids, glycerol, sterols, steroids, glycolipids, prostaglandins, leukotrienes, thromboxanes, iodine number, rancidity.

Protein Chemistry

Definition, classification, composition of proteins, amino acids, their classification and properties, protonic equilibria of amino acids, separatory techniques for amino acids and proteins, biologically important small peptides, confirmation of proteins - levels of structural organization.

Structure-function relationship of proteins

(a) Oxygen transport proteins – Myoglobin structure and function structural basis and physiological functions of haemoglobin – co-operative binding, Bohr effect, role of 2,3 Diphosphoglycerate, fetal haemoglobin, modification of Hb structure and disease-glycated haemoglobin, HbM, HbC, thalassemias, HbS.

(b) Collagen structure and function: Lipoprotein – Structural characteristics, classification and biological importance.

(c) Structure and functions of immunoglobulins.

Nucleic Acids

Definition, structural description and functions of nucleic acids, their constituents and derivatives in our body. Biologically important nucleotides and their significance – synthetic analogues of purines and pyrimidines of medical importance.

Enzymes

(a) Enzymes : General Characteristics of enzymes, enzyme nomenclature, mechanism of enzyme catalysis, enzyme kinetics, enzyme inhibition, organization of multienzyme systems, regulation of enzyme activity in vivo, factors influencing enzyme activity, clinical enzymology.

(b) Co-enzymes : Definition, concepts of cosubstrate, second substrate, role of co-enzymes in group transfer reactions, classification and biological significance.

Vitamins

Vitamins : Definition, classification, occurrence, sources, daily requirements, functions, deficiency manifestations, A, D, E, K, Thiamine, Riboflavin, Niacin, Pantothenic acid, Biotin, Folic acid, Cynocobalamin, Pyridoxin, PABA and antivitamins, hypervitaminosis.

Digestion and absorption

Mechanism of digestion and absorption in gastrointestinal tract of carbohydrates, lipids, proteins, amino acids, vitamins, factors influencing digestion and absorption, role of dietary fibre.

Introduction of intermediary Metabolism

Definition, bioenergetics – Solids state, entropy, free energy (G), coupled reaction, high energy (P) compounds, oxidation-reduction reactions – definition, redox potential, electronic carriers, compartmentalization of metabolic pathways in cells and the biologic advantage of such compartmentalization.

Stages of catabolism of molecules

(i) breakdown with no energy trap.

(ii) breakdown with some force energy trap.

(iii) final pathway CMP consisting of TCA, electron transport chain and oxidative phosphorylation

Phosphorylation at the substrate level : mitochondrial electron transport and oxidative phosphorylation. Description, localization, organization of electron transport and uncouplers of oxidative phosphorylation, basic concepts of mechanism of oxidative phosphorylation.

(a) Carbohydrates : (without stress on structures). An overview and regulatory steps of glycolysis, glycogenesis, glycogenolysis, gluconeogenesis, HMP shunt, uric acid pathway, interconversion of hexoses, metabolism of fructose and galactose, blood glucose homeostasis, overview of common disorders of carbohydrate metabolism and their clinical significance, diabetes mellitus and relevant biochemical investigations, oral glucose tolerance test.

(b) Lipids : Overview of fatty acid synthesis, oxidation, ketosis, fatty liver, cholesterogenesis, biochemical basis of arterioslerosis, hyperlipoproteinemias, obesity, role of adipose tissue. Lipotropic factors and hypolipidemic drugs, Metabolic rate of cholesterol.

(c) Proteins and amino acids : Basic concepts of disposal of nitrogen, transamination, deamination, urea cycle, overview of disposal of carbon skeleton of amino acids, formation and biological significance of special compounds from amino acid- glycine, tryptophan, tyrosine, phenylalanine, histidine, sulphur containing amino acids. Common inborn errors of amino acids metabolism.

(d) Integration of metabolism of carbohydrates, lipids and amino acids, common metabolic pathway (TCA cycle).

(e) Nucleotides, purines and pyrimidines, Origin of constituents in the formation of purines, pyridimines and nucleotides, regulatory influences,

breakdown of purine and pyridimines. Biochemical basis and laboratory diagnosis of gout.

(f) Minerals : Sources, daily requirements, absorption, biochemical function and deficiency manifestations of calcium phosphorus, iron, fluoride, magnesium, copper, zinc, iodine, sodium, potassium and chloride, selenium, cobalt.

(g) Energy and nutrition : Calorie requirements, qualitative and quantitative requirements, specific dynamic action, EMR, factors influencing BMR, respiratory quotient, biological value of proteins, formulation and computation of energy requirements for a medical student, balanced and adequate diets, formulation of diets in health and diseases, protein and protein energy malnutrition, obesity, starvation.

(h) Outline of detoxication mechanisms in human body.

Composition and formation of urine, normal and abnormal :

- Constituents in urine, renal function tests, concept of clearance tests.

Electrolytes and acid base

- Regulation of fluid and electrolyte balance, disorders associated with laboratory parameters in diagnosis of fluid and electrolyte disorder. Oral rehydration solution.

- Acid base balance, blood buffers, regulation of blood buffers, regulation of blood pH, role of erythrocytes, lungs and kidneys in regulation of acid base balance, acidosis, alkalosis of respiratory and non-respiratory origin, laboratory parameters in diagnosis of acid base disorders.

Hemoglobin and related topics

- Breakdown of hemoglobin, biochemical basis of jaundice, classification and their importance, bile pigments and their importance; overview of biochemical basis of porphyrias, hepatobiliary function tests.

Gastroenterology

- Gastric and pancreatic function tests and laboratory diagnosis of common Gastric and pancreatic disorders.

Immunology and Molecular Biology

- Introduction to immunoglobulins structure, classification and functions of immunoglobulins.

- Overview of cell cycle, Genetic code, DNA replication, transcription and protein biosynthesis, mutations, general principles of recombinant DNA technology and its practical applications in medicine (Gene splicing, Cloning, Southern blot test). Outlines of biochemical basis of carcinogenesis.

Endocrinology

- Thyroid function tests
- Endocrinology : Mechanism of action and metabolic role ohormones.
- Biochemical changes in pregnancy, metabolic requirements during pregnancy, biochemical basis of contraception.
- Introduction, mode of action, pituitary hormones, hypothalamic hormones, hormones of pancreas, thyroid and parathyroid hormones, hormones that regulate calcium and phosphorus metabolism, hormones of adrenal cortex and medulla, gonadal hormones and G.I.T. hormones.

Practicals

1. Spectroscopic examination of haemoglobin and derivatives.
2. Principle of Vandenberg

test.

3. Qualitative analysis of normal and abnormal constituents of urine and interpretation of results of such analysis.
4. Principles of colorimetry.
5. Demonstration & estimation and interpretation of results of estimation of glucose, urea, creatinine, proteins bilirubins, calcium, cholesterol in blood.
6. Principles of chromatographic and electrophoretic techniques and interpretation of a chromatogram and electrophoretic pattern of serum proteins.
7. Demonstration of enzymes estimations.
   - ALP
   - SGOT
   - Amylase
   - And interpretation of results
8. Demonstration of autoanalyser, flame photometer and blood gas analyzer

A. Text Books

(i) A Review of Physiological Chemistry by Harper (25th edition, 1998)

(ii) Text book of Biochemistry by A.S. Saini (2nd edition,1996)

(iii) Text book of Biochemistry by A.V.S.S. Rama Rao

B. Reference Books

(i) Clinical Biochemistry, an IIIustrated Colour Test by Allan Gaw, Cown, Reilly, Stewart, Stepherd (1996th edition).
(ii) Biochemistry- Lippincott's IIIustrated Reviews (2nd edition, 1994).

MBBS SECOND PROFESSIONAL

PHARMACOLOGY

i) **GOAL**:

The broad goal of the teaching of undergraduate students in Pharmacology is to inculcate a rational and scientific basis of therapeutics.

ii) **OBJECTIVES**

a. **KNOWLEDGE**

At the end of the course, the student should be able to:

1. describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs.

2. list the indications, contraindications, interactions and adverse reactions of commonly used drugs.

3. indicate the use of appropriate drug in a particular disease with consideration to its cost, efficacy and safety for

   i) individual needs.
   ii) mass therapy under national health program.

4. describe the pharmacokinetic basis, clinical presentation, diagnosis and management of common poisonings.

5. list the drugs of addiction and recommend the management.

6. classify environmental and occupational pollutants and state the management issues.

7. indicate causations in prescription of drugs in special medical situations such as pregnancy, lactation, infancy and old age.

8. integrate the concept of rational drug therapy in clinical pharmacology.

9. state the principles underlying the concept of 'Essential Drugs'

10. evaluate the ethics and modalities involved evaluate the ethics and modalities involved in the development and introduction of new drugs.

b. **SKILLS**

At the end of the course, the student should be able to:

1. prescribe drugs for common ailments.

2. recognise adverse reactions and interactions of commonly used drugs.

3. observe experiments designed for study of effects of drugs, bioassay and interpretation of the experimental data.

4. scan information on common pharmaceutical preparations and critically evaluate drug formulations.

c. **INTEGRATION**

Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments and pre clinical departments

SYLLABUS

General Pharmacology :

- *Explanation of the terms* : Pharmacology, drug, pharmacokinetics, pharmacodynamics, pharmaco-therapeutics.

  Placebo, reactors, negators, orphan drug, health orphan

  Terminology of allied branches, sources of information, drug nomenclature

- *Nature and source of drugs* : Common source e.g. plants, animals etc. Definition of the terms : alkaloids, glycosides, oils, tannin etc.

- *Routes of drug administration :*
  Common routes, advantages and disadvantages, new drug delivery systems

- *Pharmacokinetics :*
  (a) Absorption and bioavailability of a drug

(b) Routes of absorption, factors affecting drug absorption and bioavailability

(c) Bioequivalence - definition and significance

(d) Distribution of drugs : concept of apparent volume of distribution, protein binding of drugs, blood brain and placental barriers

(e) Biotransformation, definition, types of reactions, consequences, factors affecting biotransformation and clinical importance

(f) Excretion – different routes and factors affecting excretion; first order and zero order kinetics.

(g) Optimization of dosage regimen: biological half-life, loading dose, maintenance dose and steady state plasma concentration

(h) Therapeutic drug monitoring

(i) Methods of prolonging the duration of action of a drug

- *Pharmacodynamics :*

Principles of drug action, drug- receptor interactions, orphan receptors
Dose response relationship, different components like ED_{50}, LD_{50} therapeutic index
Factors affecting drug response-physical factors, pharmacokinetics, route of drug administration, synergism, antagonism, accumulation
Factors related to the patient-age. body weight, sex, pharmacogenetics, tolerance, dependence

- *Adverse drug reactions :* Definition, types and clinical importance

Drug toxicity- organt toxicity, hypersensitivity, teratogenicity, carcinogenicity dependence.

- *Rational drug therapy :* concept, examples
- *Essential drug concepts :* Principle, importance, model list preparation.
- **Practical :**

Formulations (dosage forms) - tablets, capsules, enteric coated preparation, ointment, paste, syrup, aerosols etc.

Prescription writing - rational approach

Poisoning

- Principles of management of poisoning.
- Heavy metal antagonists. : Dimercaprol, d- Penicillamine, EDTA and related drugs.

Autonomic Nervous System

- *Introduction :* Brief review and physiology of autonomic nervous system .
  Definition of the terms- cholinergic, adrenergic, receptors
  Broad outline of actions

- *Cholinergic receptor agonists :* Definition and classification
  Esters of choline –acetylcholine (prototype)
  Alkaloids-pilocarpine (prototype)
  Anticholinesterases- neostigmine (prototype)
  Glaucoma, myasthenia gravis and organophosphorous compound poisoning

- *Muscarinic receptor antagonists :* Definition
  List of drugs-belladonna alkaloids and atropine substitutes
  Discussion-atropine (prototype)
  Advantages and disadvantages of clinically used atropine substitutes

- *Adrenergic receptor agonists :* Definition
  Endogenous catecholamines-epinerphrine, norepinephrine and dopamine
  Brief review of biosynthesis, storage and release
  Discussion-epinephrine (prototype)

- β-*adrenergic receptor agonists*-selective and non-selective
  Classification of drugs, pharmacological actions, advantages, uses and adverse effects. β_1 and β_2 selective agents
  Miscellaneous-amphetamine and ephedrine, actions, uses and limitations

- *Adrenergic receptor antagonists* : Definition, types α – blockers-Classification of clinically used selective and non selective preparations, actions, uses and adverse effects. β - blockers-Classification of preparations, actions, uses and side effects. Discussion-propranolol (prototype) β_1 antagonists advantages, uses and adverse effects.

Practical :

Prescription writing and problem related to myasthenia gravis, glaucoma, organophosphorous poisoning and post-operative paralytic ileus.

Interpretation of experimental graphs viz. effect of drugs on rabbit small intestine, effect of drugs on frog heart, effect of drugs on frog blood vessles, effect of drugs on rabbit eye, effect of pain killers in rats, effects of drugs on frog rectus.

To show does-response relationship of agonist and antagonist drugs and clinical pharmacogical experiments

Blood, Reticuloendothelial and Immune Systems

- *Haematopoietic agents:* Growth factors, minerals and vitamins

Erythropoietin, mycloid growth factors and thrombopoietin preparations and uses

- *Pharmacotherapy of iron deficiency anaemia :* review of physiology of iron metabolism oral and parenteral preparations, indications, adverse effects and treatment of overdosage

- *Pharmacotherapy of megaloblastic and pernicious anaemias :*

Folic acid and vitamin B_{12} - preparations, actions, uses, inter-relationship between folic acid and vitamin B_{12}

- *Pharmacotherapy of thromboembolic disorders :*

Anticoagulants, classification (heparin and oral anticoagulants)
Discussion as per format

Thrombolytics and antiplatelet agents preparations, pharmacological basis for their actions and uses.

- *Haemostatics* : Classification of drugs, actions and uses.

- *Pharmacotherapy of shock* : List drugs used in different types of shock, rationale for using these drugs, adverse effects and precautions

- *Immunmodulators* : Immunostimulants and immunosuppressants
  Definition and examples

- **Practical :**
  Prescription writing and problems related to –Anaemias, malaria

Respiratory System

- *Pharmacotherapy of bronchial asthma* : Types of bronchial asthma acute, chronic and acute severe asthma (status asthmaticus), COPD

  Classification of drugs, mechanism of action/pharmacological basis for the use, advantages and disadvantages of each group, adverse effects, drug interactions, contraindications and special features.

- *Antihistaminics :* Classification, comparison of various groups.
  Discussion as per format.
  Pharmacotherapy of allergic rhinitis : List of drugs, mechanism of action, advantages and limitations.

- *Pharmacotherapy of cough :*
  Antitussives and mucolytic agents examples for each group, mechanism of action. usefulness and limitations, adverse reactions and cautions.

Practical :

Prescription writing and clinical problems related to common acute respiratory infections, tuberculosis, bronchial asthma and allergic rhinitis.

Cardiovascular System

- *Pharmacotherapy of myocardial ischemia:* Definition and types of angina
  Antianginal drugs –classification, rationale for using the same
  Antiplatelet agents classification, rationale for using the same
  Management of Acute Myocardial Infarction

- *Pharmacotherapy of hypertension:* Introduction and grading
  Relation between salt intake, sympathetic nervous system and hypertension
  Classification, rationale for use, adverse effects and use: general discussion as per format Management principles:
  Non-pharmacological and pharmacological management, combination therapy.

- *Pharmacotherapy of cardiac failure:* Review of pathogenesis,
  List of drugs, rationale for use in congestive cardiac failure, advantages and disadvantages
- *Pharmacotherapy of arrhythmias:* (working knowledge of commonly used drugs)
  Introduction of types of arrhythmias, re-entry mechanism, classification of antiarrhythmic drugs depending on mode of action and adverse reactions.
  Brief account of each group to elucidate the rationale for their use
  Pharmacotherapy of Hyperlipoproteinaemias:
  Common drugs in clinical use, mechanism of action, limitations and clinical utility HMGCoA reductase inhibitors, fibric acid derivatives etc.

- **Practical :**

Prescription writing and problems related to angina, hypertension, rheumatic heart disease, congestive cardiac failure and myocardial infarction.

Gastrointestinal System

- *Pharmacotherapy of peptic ulcer:* Introduction, review of pathogenesis
  Therapeutic strategies
  Discussion of individual groups/prototypes as per format
  Comparison between various groups

- *Pharmacotherapy of vomiting:* Classify drugs for various situations eg. motion sickness, cancer therapy, drug induced vomiting, pregnancy.
  Discussion of drugs as per format metoclopramide,domperidone and cisapride

- *Pharmacotherapy of constipation :* classification, mechanism
  of action and adverse effects of various groups
  Selection of appropriate purgatives for the different situations.

- *Pharmacotherapy of diarrhoea :* Oral rehydration solution – constituents, indications Parenteral fluid therapy – indications.
  Non-specific antidiarrhoeals and
  antispasmodic agents

- **Practical :**
  Prescription writing and problems related to : diarrhoea, acid-peptic disease, amoebiasis, worm infestations, vomiting, intestinal colic and constipation.
  Demonstration of ORS and IV fluids – dextrose, dextrose in saline, isotonic saline and Ringer lactate. Explain their uses and precautions.

Hepatobiliary System

- Hepatotoxicity of drugs : Brief discussion.
- Drugs used in dissolution of gall stones.

Kidney and Electolytes

- *Diuretics :* Definition, review of process of urine formation
  Classification and comparison of salient features, study of the topic as per format
- *Nephrotoxic Drugs :* List of drugs and discussion of precautions
- *Urinary tract infection :* Common organisms
  Definition and classification of urinary antiseptics and analgesics

Principles of drug treatment of upper and lower urinary tract infection due to E. coli, Proteus,
Klebsiella, Pseudomonas
Review antimicrobials of choice for common infections

- *Antidiuretics :* Classification, uses, ADH as prototype

- **Practical :**

Prescription writing and problems related to urinary tract infection due to E. coli, Proteus, Klebsiella, Pseudomons

Endocrine System and Metabolism

- *Introduction :* definition, release, feedback, control and general mechanism of action of hormones.
  Hypothalamus : Hormones, feedback mechanism,

actions and uses

- *Anterior pituitary hormones:* Classification
  Growth hormone – review of consequences of excess and deficiency.
  Preparations and probable uses.
- *Posterior pituitary hormones :* Classification
  Antidiuretic hormone and its analogues – preparations, mechanism of action, uses and adverse effects
- *Thyroid and antithyroid drugs :* Review biosythesis and physiology of thyroid hormones, consequences of excess and deficiency of thyroid hormones
  Classification of drugs used to treat hypo□and hyperthyroidism
  Discuss the common drugs as per format
  List drugs that are liable to cause hyper or hypothyroidism
- *Agents affecting calcification and bone turnover :* Parathoromone, Calcitonin, Vitamin D Integrated physiological role and therapeutic implications
- *Adrenocorticosteroids and their synthetic analogues :*
  Review of synthesis, regulation and physiological actions
  Preparations and comparison of salient features Discuss the pharmacology as per format
- *Pharmacology of endocrine pancreas :* list of secretions
  Diabetes mellitus – review pathogenesis and life styles

Principles of management, role of insulin and oral hypoglycaemics, list of various preparations and comparison of salient feaures
Discuss the commonly used preparations as per format
Glucagon – actions and uses
Enumeration of drugs which may modify the blood sugar level

- **Practical :**
  Prescription writing and clinical problems related to : hyperthyroidism, hypothyroidism, diabetes mellitus, rickets and osteomalacia, Cushing's Syndrome, adrenal insufficiency.

Reproductive System

- *Sex hormones :* Classification of male and female sex hormones
  Review feedback regulation and physiology, enumerate preparations, study the topic as per format
- *Antagonists :* Classification, uses and rationale : Antiandrogens, Antioestrogens, Antiprogestins
- *Anabolic steroids :* Classification, basis for use, misuse
- *Hormonal contraceptives :* Types, mechanism of action, pharmacological actions, uses, choice of preparation, adverse effects and contraindications
- *Ovulation inducing agents :* Classification, basis for use and adverse effects
  Oxytocics and tocolytics : Classification, mechanism of action, uses and adverse effects
- Sexually transmitted disorders : Preparations of choice

- **Practical**
  (a) Prescription writing and clinical problems related to gonorrhoea, syphilis

Growth, Development and Genetics

- *Drugs and placental barriers*
  Medication during pregnancy : Examples of safe drugs, teratogenicity, types of damage to foetus and prevention.
- *Medication during lactation :* Examples of drugs secreted in breast milk, consequences and
  precautions

- *Pharmacogenetics :* Definition and examples *Medication to elderly*
- *Medication to neonates*
  Drugs affecting lactation : Bromocriptine as prototype, discussion as per format.

- **Practical :**
  Principles of selection of appropriate drugs during pregnancy and lactation. Dosage in neonates and geriatrics

Autacoids and related drugs

- Histamine, 5- HT and their antagonists : Classification, uses and side effects
  Plasma kinins, Angiotensin & ACE – Inhibitors : Mechanism of action, uses, side effects
- Postaglandins and Leukotrienes : Formation, types, actions, uses and side effects.
- **Practical :**
  Prescription writing and problems related to allergic skin reaction, allergic rhinitis

Central Nervous System and Special Senses

- *Introduction :* Blood brain barrier and neurotransmitters
  - *Aliphatic alcohols :* Ethanol and methanol□effects on different organ systems Acute and chronic alcoholism, methyl alcohol poisoning

- *General anaesthetics :* Principles, classification, mechanism, advantages, disadvantages and comparison
  Brief notes on various types of anaesthesias e.g. balanced anaesthesia, dissociative anaesthesia, neurolept analgesia etc.
  Preanaesthetic medication – rationale and examples
- *Local anaesthetics :* Types of local anaesthesia, classification, mechanism, uses and adverse effects
- *Sedatives, hypnotics and pharmacotherapy of insomnia :* Benzxodiazepines and Barbiturates – advantages and disadvantages, discussion as per format
- *Pharmacotherapy of epilepsies :*
  Types of epilepsies and drugs for each. Discussion as per format
- *Pharmacotherapy of Parkinsonism :* Classification of drugs and mechanism of action.

Principles of drug therapy
Discussion of drugs as per format

- *Opioid analgesics and antagonists :* Classification, mechanism, pharmacological actions, uses, adverse effects, acute poisoning, management and drug dependence
- *Psychopharmacology :* Antipsychotics, Anxiolytic Drugs, antidepressants, drugs used in mania.
  Discussion of prototype drugs as per format
- *Contemporary drug abuse :* Examples, features of addiction and principles of management
  CNS stimulants : list probable uses, basis and limitations

Practicals :

Prescription writing and problems related to : Insomnia, Parkinsonism, Epilepsy, Severe visceral pain, Psychiatric disorders, Opioid poisoning, Alcohol poisoning.

Musculoskeletal System

- Nonsteroidal anti-inflammatory drugs (MSAIDS) :
  Classification and discussion of group/prototypes as the format comparison of the salient features of various groups.
- Gout : Acute and chronic gout, drug treatment and prophylaxis Discussion of drugs as per format

- *Rheumatoid arthritis :* Classification of drugs, actions, limitations and adverse effects
- *Skeletal muscle relaxants :* Classification
  Discussion of drugs as a group or prototype as per format
  Comparison of salient features of various groups

Practical :

Prescription writing and problems related : Acute and chronic gout, fever, inflammation, somatic pain

Antimicrobial and Cancer Chemotherapy

Antimicrobial : Definition and classification, general principles of antimicrobial chemotherapy

Antibacterial drugs : Discussion as per format

Sulphonamides, trimethoprim and co-trimoxazole

Beta-lactam antibiotics – Penicillins, cephalosporins, monobactrous

Beta-lactamase inhibitors – examples, rationale for combining with beta-lactams

Aminoglycosides classification, streptomycin, gentamicin, amikacin, netilmicin, tobramycin, neomycin general features, mechanism, kinetics and adverse effects, comparison of clinically useful preparations

Tetracyclines and chloramphenicol discussion as per format

Fluorquinolones – discussion as per format

Macrolides – classification, discussion as per format, newer macrolides

Erythromycin - prototype

Brief discussion on miscellaneous group of antibiotics e.g. bacitracin, vancomycin, clindamycin, polymyxin B, spectinomycin, fusidic acid etc.

- *Pharmacotherapy of tuberculosis :*

  Classification according to antibacterial effect, comparison between primary and secondary antitubercular drugs, regimens and prophylaxis. Discussion of individual drugs as per format

  Drugs for resistant tuberculosis and their limitations
- *Chemotherapy of leprosy :* Introduction and aetiopathogenesis of leprosy Classification of antileprosy drugs and multiple drug therapy
- *Pharmacotherapy of worm infestations :* Classification of drugs, mechanism of action, adverse effects and uses – mebendazole, thiabendazole, albendazole, levamisole, pyrantel pamoate, praziquantel and niclosamide
- *Pharmacotherapy of amoebiasis and giardiasis :* Classification

  Discussion of the individual drugs as per format - metroanidazole, tinidazole and diloxanide furoate
- *Antiparasitic Drugs :*

  Malaria – classification of drugs according to parasitic stage or use, chloroquine, primaquine, mefloquine and quine

  Filariasis - diethylcarbamazine and ivermectin

  Leishmaniasis - drugs, actions, side effects
- *Antifungal agents :* Classification of drugs

  Discussion as per format of Amphotericin B, Griseofulvin, Ketoconazole, Fluconazole

- *Antiviral agents :* Classification of drugs. Discussion as per format Acyclovir, Vidarabine, Ziduvidine
- *Anticancer drugs* : Basic principles of management, classification, synopsis of groups of drugs, uses, adverse effects.
- **Practical :**
  Prescription writing and problems related to pneumonias, tuberculosis, leprosy, urinary tract infections, diarrhoeal diseases, malaria, filaria, worm infestation, acne, skin infections, herpes.

FORENSIC MEDICINE

i) **GOAL**;

The broad goal of the teaching of undergraduate students in Forensic Medicine is to produce a physician who is well informed about medicolegal responsibilities in practice of medicine. He/she will also be capable of making observations and inferring

conclusions by logical deductions to set enquiries on the right track in criminal matters and connected medicolegal problems. He/she acquires knowledge of law in relation to medical practice, medical negligence and respect for codes of medical ethics.

ii) **OBJECTIVES**

a. **KNOWLEDGE**

At the end of the course, the student should be able to:

1. identify the basic medicolegal aspects of hospital and general practice.

2. define the medicolegal responsibilities of a general physician while rendering community service either in a rural primary health centre or an urban health centre.

3. appreciate the physician's responsibilities in criminal matters and respect for the codes of medical ethics.

4. diagnose, manage and identify also legal aspects of common acute and chronic poisonings.

5. describe the medicolegal aspects and findings of post-mortem examination in case of death due to common unnatural conditions & poisonings.

6. detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen's Compensation Act.

7. describe the general principles of analytical toxicology.

The following has been added in terms of notification published on 15.12.2008 in the Gazette of India

8. Medical jurisprudence in view of the Consumer Protection Act – wherein doctors have been covered under its ambit. They have both rights as well as responsibilities. Under medical insurance acts of negligence covered as well as rights for effective service delivery.

b) SKILLS

At the end of the course, the student should be able to :-

1. make observations and logical inferences in order to initiate enquiries in criminal matters and medicolegal problems.

2. diagnose and treat common emergencies in poisoning and manage chronic toxicity.

3. make observations and interpret findings at postmortem examination.

4. observe the principles of medical ethics in the practise of his profession.

(c) **INTEGRATION**

Department shall provide an integrated approach towards allied disciplines like Pathology, Radiology, Forensic Sciences, Hospital Administration etc. to impart training regarding medicolegal responsibilities of physicians at all levels of health care. Integration with relevant disciplines will provide scientific basis of clinical toxicology e.g. medicine, pharmacology etc.

Inclusion of Objectives

1. Identify the basic medicolegal aspects of hospital and general practice.
2. Define the medicolegal responsibilities of a general physician while rendering community service either in a rural primary health centre or an urban health centre.
3. Diagnose, manage and identify also legal aspects of common acute and chronic poisoning.
4. Make observations and logical inferences in order to initiate enquiries in criminal matters and medicolegal problems.
5. Make observations and interpret findings at post-mortem examination.
6. Observe the principles of medical ethics in the practice of his profession.

1. Introduction and Legal Procedures

Explanation of the terms : Forensic Medicine, Medical Jurisprudence, State Medicine, Legal Medicine, Forensic Pathology, with the importance of each. Legal procedure at an Inquest. Type of Inquests i.e. Police Inquest, Magistrate's Inquest, Coroner's Inquest. Criminal Courts in India and their powers. Procedures in the court : (Summons, Oath, Recording of Evidence). Medical Evidence (Documentary i.e. Medical certificates, Medico–legal Reports/Postmortems Reports, Dying Declaration/Dying Deposition and Oral evidence i.e. Appearance of a doctor in the Court) Types of Witnesses : Common and expert witness.

2. Medical Jurisprudence (Legal and Ethical aspects of medical practice)

Distinguishing Ethics and Etiquettes, Hippocratic Oath and latest recommendations about its modification. Medical councils (Indian Medical Council and State Medical Council) with their constitution and functions, disciplinary control, penal erasure. Privileges of a Registered Medical Practitioner, Infamous Conduct, Dichotomy, Professional Secrets, Privileged Communication, Professional Negligence (Civil and Criminal), Vicarious Liability, Doctrine of Res Ipsa Loquitur, Contributory Negligence, duties of a medical practitioner towards his patients and the society and the State. Consent, Consumer's Protection Act, Constitution of various fora, their powers, purpose of the act, procedure for lodging complaints.

3. Death and its medicolegal aspects

Definition of death, Somatic and Molecular deaths, Brain Death, modes of death, Suspended Animation, signs of death (i.e. cessation of vital functions, changes in the eye, cooling of the dead body, postmortem staining, changes in the muscles i.e. primary flaccidity, rigor mortis, secondary flaccidity, cadaveric spasm, heat stiffening, cold stiffening) Decomposition/Putrefaction : Definition, external signs of decomposition like colour changes, development of foul smelling gases and their pressure effects, internal signs of decomposition in the form of changes in the various organs, circumstances modifying putrefaction, appearance of maggots and their significance, adipocere formation, mummification. Presumption of death and survivorship.

4. Death from Asphyxia

Definition and signs of asphyxia, classification of asphyxial death.

(a) Hanging : Complete/Partial hanging, typical/atypical hanging, cause of death in hanging, fatal period, external and internal postmortem findings and medicolegal aspects of hanging.

(b) Strangulation : Definition, types i.e. strangulation by ligature, throttling or manual strangulation, strangulation by means other than a ligature material or by hand, garroting, mugging, cause of death, fatal period, external and internal postmortem findings, medicolegal aspects. Differentiations between hanging and strangulation.

(c) Drowning (Immersion) : Definition, cause of death, types of drowning. Dry drowning, wet drowning, fresh water drowning, salt water drowning, shallow water drowning, immersion syndrome and secondary drowning. Pathophysiology of drowning in case of fresh water and salt water. Fatal period, external and internal postmortem findings, laboratory diagnosis and medicolegal aspects of drowning.

(d) Suffocation deaths : Definition, types of suffocations : i.e. Smothering, Choking, Gagging, Traumatic Asphyxia, Overlying, Inhalation of irrespirable gases and Burking, Cause of death, Fatal period, external and internal postmortem findings and medicolegal aspects of each.

5. Thermal deaths

General effects of Heat i.e. heat cramps, heat exhaustion, heat stroke, local effects of heat i.e. burns due to flame, Dupuytren's classification, medicolegal classification, age of burns, cause of death, fatal period, factors influencing the outcome and prognosis of burns, external and internal postmortem findings, and medicolegal aspects of burns.

(a) Scalds : Production, features and medicolegal aspects of scalds

(b) Cold : General effects i.e. Hypothermia and local effects of cold i.e. frost bite, trench foot, External and internal postmortem findings and medicolegal aspects in deaths due to the cold.

6. Deaths due to electricity and lightning

Factors influencing Electrocution, causation and outcome of effects of electric current. Cause of death, external and internal postmortem findings and medicolegal aspects of deaths due to electrocution. Phenomenon of Lightning,

external and internal postmortem findings in death due to lightning and its medicolegal aspects.

7. Injuries (Medicolegal Considerations and Types)

Definition of injury, wound, antemortem and postmortem injuries, acts of volition, concept of mortal wound, offences against the human body as enshrined in the Indian Penal code and classification of injuries:

I. Mechanical or Physical Injuries :

(a) Those caused by Blunt Force

- Abrasions
- Contusions (Bruise)
- Lacerations

(b) Those caused by Sharp Force

- Incisions
- Punctures (punctures may incised□punctures or lacerated punctures)

(c) Caused by Firearms

- By rifled firearms
- By Smooth-bored firearms
- By country made weapons

II. Thermal Injuries

(a) Due to heat

Generalized effects of heat i.e.

- Heat hyperpryexia (Heat stroke)
- Heat exhausation (Heat Collapse)
- Heat Cramps (Miner's Cramps)

Effects of local application of heat

- Burns (due to application of dry heat)
- Scalds due to application of moist heat)

(b) Due to cold

Generalized effects of cold like

- Hypothermia

Local effects of cold like

- Frost bite (due to dry cold)
- Trench foot (due to wet cold)

III. Caused by chemical agents

- Corrosion (due to strong acids or alkalies)
- Irritation (due to weak acids, alkalies, vegetables or animal extracts etc.)

IV. Miscellaneous

A. Lightening

- Electricity
- Radiation (X-rays, Ultra-violet rays, radio-active substances etc.)
- Blast injuries

B. Depending upon gravity

- Simple
- Grievous
- Dangerous

C. Depending upon time of infliction

- Antemortem
- Postmortem

- Perimortem

D. Depending upon the manner of infliction

- Suicidal
- Accidental
- Homicidal
- Defence Wounds
- Self-inflicted/Self Suffered
- Fabricated/fictitious injuries

8. **Blunt Force Injuries**

Abrasions :

Definition, types i.e scratches, grazes, pressure abrasions, imprint abrasions age of abrasious and medicolegal aspects.

- Bruise (Contusion) : Definition, factors influencing, production and appearance of bruise, age of bruise and medicolegal aspects.

- Laceration : Definition, types; Split, tears, stretch, avulsion, characters and medicolegal aspects lacerated wounds.

9. **Sharp Force Injuries**

- Incised wounds : Definition, characters, age and medicolegal aspects.

- Punctured or stab wounds : Definition, types i.e. puncture, penetrating and perforating wounds, characters of puncture/stab wounds and medicolegal aspects.

10. **Firearm Injuries**

Structure of firearm and cartridge, types of firearms, composition of cartridge, types of projectiles, characters of injuries, produced by rifled and smooth-bored firearms at various ranges. Riccohetting of bullet, Tandem bullet. Procedure for conducting autopsy in death due to firearm injuries and medicolegal aspects.

11. **Explosion Injuries**

Mechanism of production characters of the wounds, cause of death and medicolegal aspects.

12. **Transportation Injuries**

Injuries received in road accidents, by the pedestrians motorcyclists/scooterists, front seat passengers and back-seat passengers. Medicolegal aspects of transportation injuries.

13. **Regional Injuries**

Injuries to the Head **:** Scalp, Skull and brain, concussion, extra dural haemorrhage, subdural haemorrrhage, sub-arachnoid haemorrhage, intra-cerebral haemorrhage. Contusions and lacerations of brain. Salient features of injuries to the other parts of the body.

14. **Sexual offences and sex perversions**

Definition, types i.e. natural and un-natural sexual offences : rape (definition, explanation of sections 375 and 376 of I.P.C., procedure for external and internal examination of the victim and medicolegal aspects). Adultery, Incest, Un-natural sexual offences : Sodomy, Lesbianism, Buccal Coitus, Bestiality. Sex-perversions : Mascochism, Voyeurism, transvestism and fetichism.

15. **Pregnancy and delivery**

Signs of pregnancy in the living and in the dead and their medicoegal aspects. Signs of recent delivery in the living and in the dead, signs of remote delivery in the living and in the dead. Pseudocyesis, superfecundation, superfetation, surrogate motherhood.

16. **Abortion**

Definition, types i.e. spontaneous and induced abortion. Medical Termination of Pregnancy Act, (MTP Act), Methods adopted for inducing criminal abortion i.e. abortifacient drugs, use of general violence, use of local violence. Cause of death and complications and criminal abortions. Postmortem findings in case of death due to criminal abortions. Penal provisions related to criminal abortions.

17. **Infanticide**

Definition, differentiation between English law and Indian law, dead born/still born. Age of viability and its determination, signs of live-birth. Medicolegal aspects of infanticide. Abandoning of children.

18. **Potency, Legitimacy and Fraternity**

Medicolegal significance of impotency, sterility, artificial insemination, legitimacy,paternity and disputed paternity.

19. **Virginity and defloration**

Definition, Medicolegal importance of hymen, true and false virgin.

20. **Social, legal and ethical aspects of AIDS**

Social problems, medical problems, legal aspects of diagnosis and ethical/moral aspects in relation of patients and society at large.

21. **Forensic Psychiatry**

Definition, medicolegal aspects and types of illusion, hallucination, delusion, impulse, somnambulism, delirium, obsession, lucid interval and phychopath. Classification of Psychiatric disorders. True and false insanity, restraint of the

insane, civil and criminal responsibility of the insane. Doctrine of diminished responsibility. Testamentary capacity.

22. **Forensic Toxicology**

General aspects of poisoning, laws relating of poisons, duties of a medical practitioner in a case of suspected poisoning, evidence of poisoning in the living and the dead, collection, preservation and despatch of viscera for chemical analysis. Classification of poisons. Diagnosis and management of common poisons : Alcohol, aluminium phosphide, zinc-phosphide, barbiturates, tranquillisers, organophosphorus compounds, morphine (heroin), anaesthetic gases, cannabis, cocaine, carbonmonoxide, lead, thallium, aconite, food poisoning, antidepressants and hallucinogens. Differentiation between poisonous and non-poisonous snakes, constituents and actions of venoms in various snakes. Diagnosis and management of snake-bite. Post-mortem findings in death due to snake-bite.

PATHOLOGY

GOAL

The broad goal of the teaching of undergraduate student in Pathology is to provide the students with a comprehensive knowledge of the mechanisms and causes of disease, in order to enable him/her to achieve complete understanding of the natural history and clinical manifestations of disease.

ii) **OBJECTIVES**

a) KNO**W**LEDGE

At the end of the course, the student should be able to :-

(1) describe the structure and ultrastructure of a sick cell, mechanisms of cell degeneration, cell death and repair and be able to correlate structural and functional alterations.
(2) explain the pathophysiological processes which govern the maintenance of homeostasis, mechanisms of their disturbance and the morphological and clinical manifestations associated with it.
(3) describe the mechanisms and patterns to tissue response to injury such that she/he can appreciate the pathophysiology of disease processes and their clinical manifestations.
(4) correlate normal and altered morphology (gross and microscopic) of different organ systems in common diseases to the extent needed for understanding of disease processes and their clinical significance.

b. **SKILLS**

At the end of the course, the student should be able to:-

1. describe the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results;

2. perform the simple bed-side tests on blood, urine and other biological fluid samples;

3. draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders;

4. understand biochemical/physiological disturbances that occur as a result of disease in collaboration with pre clinical departments.

c. **INTEGRATION**

At the end of training he/she should be able to integrate the causes of disease and relationship of different etiological factors (social, economic and environmental) that contribute to the natural history of diseases most prevalent in India.

General Pathology

- Cell injury : Reversible and irreversible – mechanism

- Necrosis : Definition, types, examples and morphology. Differences between necrosis and apoptosis.

- Pathologic calcification : Definition, types, examples and mechanism
- Fatty change in the liver and heart : Pathogenesis and morphology

- Intracellular accumulations of protein, amyloid, glycogen and pigments (melanin, haemoprotein derived lipofuscin).

- Subcellular alterations
- Enzymes deficiency disorders: Concept and examples
  - Gaucher's disease, Niemann-Pick disease, Tay-Sachs disease

  - Cystic Fibrosis : Definition, pathogenesis, morphology and clinical features.
  - Cytogenetic disorders : Down's, Turner's and Klinefelter's syndromes brief discussion
  - Inflammation and repair :

Definitions

Acute & chronic inflammation morphological types, vascular types and cellular responses Chemical mediators and their role in inflammation

Granuloma - Definition, description and diseases (tuberculosis, leprosy, syphilis, sarcoidosis, actinomycosis)

Wound healing Mechanisms

Shock Definition, morphological changes in target organs and actiopathogenesis
Ocdema Pathogenesis, types

Thrombosis Types, pathogenesis, morphology and fate of thrombus

Embolism:Definition and types

Infarction - Sites, types and consequences

- Chronic venous congestion Gross and microscopic changes in lungs, liver and spleen
- Growth disturbances : Atrophy, Hypertrophy, Hyperplasia, Hypoplasia, Metaplasia, Malformation, Agenesis, Dysplasia.
- Neoplasia : Definitions, benign versus malignant, characteristics of tumours, carcinogenesis, routes of spread, paraneoplastic syndromes, diagnosis tumours.
- Soft tissue tumours : Definition and classification

  Gross and microscopic features of :

  Lipoma Liposarcoma

  Fibrosarcoma Leiomyosarcoma

  Rhabdomyosarcoma

- Tumours : Nervus - Definition, types (intradermal and compound), morphology, Aetiology, morphology and mode of spread of

  Basal cell carcinoma

Squamous cell carcinoma
Malignant melanoma

Diseases of Immunity

- General features of immune system : cell types, antibodies
- Histocompatibility antigens
- Hypersensitivity reactions Types with examples
- Primary and secondary immune deficiency diseases : Examples
- Acquired immunodeficiency syndrome : Aetiopathogenesis
- Systemic Lupus Erythematosus – Pathogenesis and morphology
- Amyloidosis–Definition, classification, morphology and application of special stains in its identification.
- Organ Transplantaion : Role of major histocompatability antigens.
- Auto immune diseases : Definition and examples
- LE Cell phenomenon, Anti-nuclear factor (ANF), Anti-neutrophil cytoplasmic antobodies (ANCA)

Haematopoietic system

- Anaemias : Classification based on aetiology and morphology
- Iron deficiency anaemia : Aetiology and lab diagnosis
- Megaloblastic anaemia : Aetiology and lab diagnosis
- Sideroblastic anaemia: Aetiology and lab diagnosis
- Aplastic anaemia: Aetiology and lab diagnosis
- Hemolytic anaemia
    - Hereditary sphercytosis: Aetiopathogenesis and lab diagnosis
    - Sickel cell anaemia: Aetiopathogenesis and lab diagnosis
    - Thalassaemia: Aetiopathogenesis, blood picture, morphology and complications
    - Paroxysmal nocturnal hemoglobinuria
    - G-6PD deficiency
    - Drug induced hemolytic anaemia

- Platelet disorders
  - Idiopathic thrombocytopenic purpura, drug-induced thrombocytopenia
  - Thrombotic thrombocytopenic purpura - Aetiopathogenesis and lab diagnosis
- Leucocytic disorders : Leucocytosis, leukemoid reactions, leucopenia
- Haemorrhagic diathesis: Basis screening tests and their significance
- Leukaemia: FAB classification of acute leukaemias, peripheral smear and bone marrow findings
- Clinical presentations and lab diagnosis of AML, ALL, CML and CLL
- Haemophilia A, B, von Willebrand's disease
- DIC-pathogenesis, etiology, lab diagnosis
- Multiple myeloma: Aetiopathogenesis, morphology and lab diagnosis

Reticuloendothelial system

- Lymphadenitis: Definition and causes

  Reactive and Tubercular gross and microscopic features
- Lymphomas:
  - Hodgkin's disease,
  - Non Hodgkin's lymphoma: Classification and brief discussion
  - Congestive Splenomegaly: Causes and morphology

Respiratory System

- Pneumonia: Aetiopathogenesis

  Lobar and Bronchopneumonia gross and microscopic features, complications
- Lung abscess: Aetiopathogenesis and morphology
- Bronchiectasis, Pathogensis, gross and microscopic features, complications

- Bronchial asthma: Mechanism and pathogenesis
- Chronic Bronchitis: Aetiology, gross and microscopic features
- Emphysema: Definition types, pathogenesis, gross and microscopic features
- Chronic Obstructive Pulmonary diseases and Cor-Pulmonale, Relation
- Hyaline membrance disease and adult respiratory distress syndrome:
  Pathogenesis, morphology and complications
- Pneumoconiosis: Definition and pathogenesis
  Anthracosis, Asbestosis, Silicosis and Berylliosis: Morphology
- Bronchogenic carcinoma: Aetiology, gross and microscopic features of –
  Squamous cell carcinoma Adenocarcinoma
  Small and Large cell carcinomas Bronchioalveolar carcinoma
- Investigations: Examination of sputum and others (relevant)
  Pulmonary tuberculosis

Cardio Vascular System

- Acute rheumatic fever
- Rheumatic heart disease: Aetiopathogenesis, microscopic features and complications
- Infective endocarditis: Pathogenesis, morphology of vegetation, comparison and complications
- Myocardial infarction: Pathogenesis, morphology and complications
- Cardiomyopathies – a brief discussion
- Pericarditis - common types
- Congestive cardiac failure: Pathophysiology
- Congenital heart disease: Examples, Fallot's tetralogy (discuss)
- Atherosclerosis: Risk factors: Gross and microscopic features of atheromatous plaques and complications
- Hypertension: Definition, classification, pathogenesis and morphological changes
- Vasculitides (Polyarteritis nodosa, Churg Strauss, Wegener's Granulomatosis, Takayasu's arteritis, temporal arteritis): Classification and brief discussion.

Alimentary tract

- Oral pathology:
  Pre-malignant lesions list and morphology
  Squamous cell carcinoma: Aetiopathology and morphology Salivary gland Tumours: Classification, common types

- Oesophagus
  Barrett's oesophagus: brief discussion
  Achalasia
  Carcinoma oesophagus: Aetiopathogenesis, gross and microscopic features

- Stomach
  Gastritis Common types, etiology, morphology
  Peptic ulcer: Definition and sites of occurrence, pathogenesis, gross and microscopic features and complications Differences between :
  a. benign and malignant ulcers b. gastric and duodenal ulcers Carcinoma stomach:
  Classification based on depth of invasion, gross pattern and microscopic features Aetiopathogenesis, gross and microscopic features and investigations

- Intestine
  Acute appendicitis: Gross and microscopic features and complications
  Carcinoid tumour and carcinoid syndrome
  Tuberculosis of intestine: Pathogenesis, gross and microscopic features, complications
  Typhoid intestine: Pathogenesis, gross and microscopic features and complications
  Amoebic colitis: Pathogenesis, gross and microscopic features and complications
  Necrotising enterocolitis: Pathogenesis and morphology
  Ulcerative colitis and Crohn's disease: Aetiology, gross and microscopic features
  Polyps of the large intestine : Classification
  Comparison of morphology Tubular and villous adenomas
  Carcinoma colon: Pathogenesis, gross and microscopic features

- Pancreas: Acute Pancreatitis, Chronic Pancreatitis, Ca Pancreas; head, body, tail and periampullary

Hepatobiliary System

- Jaundice: Types and Pathogenesis
- Amoebic liver abscess : Gross and microscopic features and complications
- Viral Hepatitis: Causes, gross and microscopic features

  Sequelae of Acute Viral Hepatitis
- Portal Hypertension: Definition, types and major clinical consequences
- Cirrhosis of liver: Definition, aetiology and morphologic types, morphology with special references to Alcoholic Cirrhosis
- Wilson's disease, Hemosiderosis, Hemochromatosis Tumours of liver: Classification

  Hepatocellular carcinoma and Hepatoblastoma

  Gross and microscopic features
- Chronic cholecystitis: Gross and microscopic features
- Cholelithiasis: Pathogenesis and morphology
- Carcinoma or Gall bladder: Gross and microscopic features

Renal Pathology

- Primary Glomerular Disease (Minimal change disease, Mesangial proliferative glomerulonephritis,

  Focal Segmental Glomerulosclerosis, Membranous Glomerulonephritis, Mesangiocapillary Glomerulonephritis) : Etiopathogenesis, pathological features, clinico pathological correlation, prognosis and relevant labortary investigation
- Polycystic kidney : Adult and childhood morphology and complications
- Glomerulonephritis : Classification

  Accute post-streptococcal, actiopathogenesis and morphology

Rapidly progressive glomerulonephritis- aetiopathogenesis, types and morphology Chronic glomerulonephritis□concept and morphology

- Nephrotic syndrome : Definition, pathophysiology and causes Differences between Nephritic and Nephrotic syndromes
- Acute tubular necrosis, Acute cortical necrosis : Definition, pathophysiology and morphology
- Accute interstitial nephritis
- Renal failure : Concept, types, causes and stages
- Urinary tract infection : Definition
- Pyelonephritis : Definition
  - Acute pyelonephritis – aetiopathogenesis and morphology
  - Chronic pyelonephrities , aetiopathogenesis and morphology
- Nephrosclerosis :

  Benign and malignant□definition, pathogenesis and morphology
- Hydronephrosis : Definition, causes and morphology
- Tumours of kidney : Benign-examples

  Brief discussion of Wilm's tumour and Renal cell carcinoma
- Urinary Bladder : Cystitis □ types and morphology

  Calculi□Types and morphology and complications

  Tumours - transitional cell carcinoma- Aetiopathogenesis, gross and microscopic features

  Urine examination : Importance and methodology

Endocrine System

- Pituitary gland : Hypopituitarism□Causes and brief discussion on

  Sheehan's syndrome

  Empty sella syndrome

  Craniopharyngioma

  Hyperpituitarism□Causes and brief discussion Pituitary adenoma
- Thyroid gland:

  Hyperthyroidism: Causes and brief discussion on thyrotoxicosis

  Hypothyroidism: Cretinism and myxoedema, brief discussion

Goiter: Types, pathogenesis and morphology

Thyroiditis: Hashimoto's and Granulomatous, aetiology, pathogenesis and morphology

Grave's disease: aetiology and morphology

Tumours:

- classification
- Gross and microscopic features of
- Thyroid adenoma
- Follicular carcinoma
- Papillary carcinoma
- Medullary carcinoma

- Parathyroid gland :
  - brief discussion

- Metabolic bone diseases : Rickets and osteomalacia□
  Clinical features, aetiology, pathogenesis and morphology
  Hyperparathyroidism, Brown tumour
- Adrenal gland : Cushing's syndrome and Addison's disease□brief discussion
  Neuroblastoma, Pheochromocytoma□brief discussion

Diabetes mellitus : Definition, types and aetiopathogenesis of IDDM & NIDDM
Morphological changes in long standing diabetes in target organs

- Zollinger: Ellison syndromes : brief discussion

Male Reproductive Syatem and Prostate

1. Prostate:

Benign hyperplasia□aetiology, pathogenesis□gross and microscopic features

Carcinoma prostate□aetiology, pathogenesis□gross and microscopic features

- Testis : Tumours – classification and examples
  Gross and microscopic features of –
  Seminoma Embryonal carcinoma
  Teratoma

- Penis : List the premalignant lesions

Carcinoma penis – squamous cell carcinoma
aetiology, gross and microscopic features

- Epididymitis : Tubercular and syphilitic

Female Genital Tract and Breast

- Cervicitis : Aetiology and morphology
- Carcinoma cervix : Aetiology, risk actors and pathogenesis
  Cervical intra epithelial neoplasia – concept
  Squamous cell carcinoma gross and microscopic features and staging
- Endometrium:
  Simple and complec (cytoglandular and adenomatous) hyperplasia
  Aetiology and morphology
  " Chocolate Cyst", adenomyosis and its complications
  Carcinoma endometrium:
  Aetiopathogenesis, gross and microscopic features
  Leiomyoma : Aetiology, gross and microscopic features
- Tumours of Ovary: Classification with examples
  Aetiopathogenesis, gross and microscopic features-
  - Mucinous cystadenoma
  - Serous cystadenoma
  - Teratoma
  - Dysgerminoma
  - Hydatidiform mole and choriocarcinoma : Gross and microscopic features
  - Breast abscess : Aetiology, gross and microscopic features
  - Tumours of breast : Classification,
  - Differential diagnosis of lump in the breast
  - Carcinoma breast pathogenesis
  - Gross and microscopic features of –
  - Fibroadenoma
  - Fibrocystic disease of breast
  - Ductal (Invasive ductal) carcinoma Medullary carcinoma
- Diagrammatic representation of location of pathological lesions in the breast
- Gynaecomastia: Definition and causes

- Paget's disease of breast : Definition, gross and microscopic features

Musculoskeletal System

- Fracture :
  Types, morphology of healing and factors delaying the healing
- Osteomyelitis:
  Aetiology, pathoenesis, clinical features and complications
- Bone Tumours: Classification, gross and microscopic features, clinical features and X-ray findings of common bone tumours
- Aetiopathogenesis, morphological features and complication of : Rheumatoid arthritis
  Gout
  Osteoarthritis
  Tuberculous arthritis

Nervous System and Eye

Meningitis: Aetiopathogenesis, gross and microscopic features of –
Bacterial meningitis
Viral meningitis
Tubercular meningitis
Examination of C.S.F. as a tool in its differential diagnosis

- Brain abscess: Aetiopatnogenesis, morphology and diagnosis
- Cerebral edema: Types based on mechanism
- Hydrocephalus: Definition, types, morphology
- Tumours: Classification and diagrammatic representation Gross and microscopic features of –
  Astrocytoma Meningioma Glioma
- Cerebrovascular accident
- Retinooblastoma : Gross and mocroscopic features

Miscellaneous

- Cytology: General aspects and various types
  Fluid cytology: Pleural, peritoneal, pericardial, synovial
  Sputum cytology
  Cervical and vaginal cytology in detail
  Fine needle aspiration cytology

Brush cytology, imprint cytology, sediment and crush smear cytology

- Radiation injury
- Disorders of pigment and mineral metabolism (bilirubin, melanin, hemosiderin)

Practicals

1. Identify and interpret the gross and/or microscopic features of :
   (a) Acute inflammation in organs such as appendix, lungs meninges
   (b) Cellular components of chronic and granulomatous inflammation
   (c) Granulation tissue, callus
   (d) Typhoid, tuberculous and amoebic ulcers in intestine
   (e) Tuberculosis of lung, lymphnodes, meninges and intestine
   (f) Rhinosporidiosis, actinomycosis, mycetoma and molluscum contagiosum
   (g) Amoebic liver abscess, malarial liver and spleen, filarial lymphadenitis, cysticercosis and hydatid cyst.
   (h) Fatty liver and kidney: amyloidosis of liver, spleen and kidney (i) Types of necrosis : caseous, coagulative liquefactive, fat. (j) Abnormalities of bone morrow.
2. Collection of blood for common hematological procedures.
3. Perform with accuracy and reliability basic haematological procedures such as haemoglobin estimation, total and differential WBC count and blood grouping, peripheral blood smear staining, examination and report.
4. Perform a complete examination of the urine and detect any abnormalities.
5. Blood grouping and Rh typing.
6. Perform the basic laboratory haematological tests like bleeding time and clotting time.

Skills

1. Interpret abnormal biochemical laboratory values of common diseases.
2. Interpret peripheral smear of common diseases.
3. Be able to collect and transport materials for various pathological tests including histopathology, cytopathology and biochemistry.
4. Do complete urine examination including microscopy.
5. Do the interpret Hb, TLC, DLC and blood smear for red cell morphology.
6. Do blood grouping and Rh typing.

MICROBIOLOGY

i) GOAL

The broad goal of the teaching of undergraduate students in Microbiology is to provide an understanding of the natural history of infectious disease in order to deal with the etiology, pathologenesis, laboratory diagnosis, treatment and control of infections in the community.

ii) OBJECTIVES

a. **KNOWLEDGE**

At the end of the course, the student should be able to:

1. state the infective micro-organisms of the human body and describe the host parasite relationship.

2. list pathogenic micro-organisms (bacteria, viruses, parasites, fungi) and describe the pathogenesis of the diseases produced by them.

3. state or indicate the modes of transmission of pathogenic and opportunistic organisms and their sources, including insect vectors responsible for transmission of infection.

4. describe the mechanisms of immunity to infections.

5. acquire knowledge on suitable antimicrobial agents for treatment of infections and scope of immunotherapy and different vaccines available for prevention of communicable diseases.

6. apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections.

7. recommend laboratory investigations regarding bacteriological examination of food, water, milk and air.

(b). **SKILLS**

At the end of the course, the student should be able to:

1. plan and interpret laboratory investigations for the diagnosis of infectious diseases and to correlate the clinical manifestations with the etiological agent.

2. identify the common infectious agents with the help of laboratory procedures and use antimicrobial sensitivity tests to select suitable antimicrobial agents.

3. perform commonly employed bed-side tests for detection of infectious agents such as blood film for malaria, filaria, gram staining and AFB staining and stool sample for ova cyst.

4. Use the correct method of collection, storage and transport of clinical material for microbiological investigations.

c. INTEGRATION

The student should understand infectious diseases of national importance in relation to the clinical, therapeutic and preventive aspects.

SYLLABUS

1. Introduction

(a) Morbidity and mortality data of infectious diseases prevalent in our country (with reference to the National Health Programme) and in the local geographic area.

(b) Significant milestone in history of Microbiology with special reference of contributions of Antony, van Leeuwenhoek, Jenner, Louis Pasteur, Robert Koch, Paul Ehrlich.

2. General Microbiology

(a) Definitions: Infection, parasite, host, vector, formite, contagious diseases, infectious diseases, colonization infection, epidemic, endemic, pandemic, zoonosis, epizootic prevalence attack rate.

(b) Routes of infections and spread, endogenous and exogenous infections, source and reservoir of infections.

(c) Bacterial cell, Prokaryotic cell, differences between Prokaryotes and Eukaryotes. Morphology in view of recognizing bacteria in clinical samples,

shape, motility and arrangements. Structures which are virulence associated, Physiology Essentials of bacterial growth requirements.

(d) Sterilisation and disinfection: In relation to patient care and disease prevention. Definitions of asepsis, antisepsis, sterilization, disinfection.

(e) Antimicrobials: Mode of action, interpretation of susceptibility tests, resistance, plasmid mediated chromosomally mediated drug resistance, spectrum of activity in infectious disease.

(f) Nosocomial infections, hospital infections, control policies, antibiotic policies.

(g) Introduction to Fungi, Viruses and Parasites.

(h) Role of vaccines in the prophylaxis of microbial infections.

(i) Bacterial genetics.

(j) Taxonomy : Classification of bacteria.

(k) Epidemiological procedures for bacterial typing (Bacteriophage typing, Sero typing).

(l) Normal Bacterial flora of the human body.

3. Systemic Bacteriology

Systemic Bacteriology will be considered under the following headings:

(i) Classification according to pathogenicity

(ii) Pathogenesis of diseases caused

(iii) Mode of transmission

(iv) Methods of prevention

(v) Collection and transport of samples for laboratory diagnosis.

(vi) Interpretation of laboratory reports.

(vii) Rapid bedside diagnosis wherever feasible

(viii) List of antimicrobial agents

(ix) National Control and Eradication Programme

(a) Pyogenic cocci: Staphylococci, Streptococci, Pneumococci, Neisseria, anaerobic cocci.

(b) Corynebacterium diphtheriae, diphtheriodes.

(c) Mycobacterium tuberculosis, M.leprae, Atypical mycobacteria.

(d) Enterobacteriaceae: General properties, Enterobacteria with reference to urinary tract infections, enteric fevers, diarrhoecal diseases, pyogenic infections.

(e) Parvobacteria : Hemophillus, Bordetella, Brucella, Pasteurella, Yersinia, Francisella.

(f) Vibrios : V. cholerae and other important Campylobacters including H. pylori

(g) Pseudomonas

(h) Bacillus anthracis

(i) Clostridia: General properties with reference to tetanus, gangrene and food poisoning

(j) Rickettsiae, Chlamydiae

(k) Anaerobes: Bacteriodes, Fusobacteria

4. Special Bacteriology

(a) Bacteriological examination of food, air, milk and water. Hospital acquired infections, collection and transportation of samples for microbiological investigations and newly emerging and remerging, microbial pathogens.

(b) Applied bacteriology : U.T.I. diarrhoeal diseases, P.U.O., Meningitis, wound infections, sore throat.

5. Virology

General properties: Basic structure and broad classification of viruses, Pathogenesis and Pathology of viral infections. Immunity and prophylaxis of viral diseases. Principle of

laboratory diagnosis of viral diseases. List of commonly used antiviral agents. Bacteriophage with relation to virulence mechanisms and epidemiology.

(a) Herpesviruses: List of viruses included, lesions produced, pathogenesis and latency, principles of laboratory diagnosis.

(b) Arboviruses: List of arboviruses prevalent in India, general properties, mode of transmission, disease syndromes produced, common diagnostic tests, prevention of spread.

(c) Picornaviruses: Common infections produced, classification and general properties, pathogenesis of poliomyelitis, immunoprophylaxis of poliomyelitis.

(d) Myxoviruses: General properties, classification according to diseases produced, antigenic variations in influenza virus with relevance to vaccine efficacy, measles, mumps and rubella, important features and prophylaxis.

(e) Rabies Virus: General properties, antirabies vaccine, antemortem diagnosis in rabies.

(f) Hepatitis viruses: List of Viruses, pathogenesis, mode of infection, list of diagnostic tests and their interpretation, methods of prevention and control.

(g) Human immunodeficiency Viruses: Structure with relevance to laboratory diagnosis and type of infection, laboratory tests and their interpretation, universal precautions, specific precautions, recent trends in diagnosis and prophylaxis.

(h) Viral gastroenteritis: Causative viruses, laboratory diagnosis of rotavirus.

(i) Applied Virology : Viral conjunctivitis, respiratory viruses, viral meningitis/ encephalitis, viral (acute) hemorrhagic fevers, viruses causing fever with rash, viruses causing congenital malformations, cogenic viruses.

6. Mycology

General Mycology, superficial mycoses, Deep mycoses, Sub-cutaneous mycoses (Mycotic mycetoma, Chromoblastomycosis, Sporotrichosis, Rhinosporidiosis and Subcutaneous Phycomycosis), Systemic mycoses (Cryptococcosis, Blastomycosis, Paracoccidioidomycosis, Coccidioidomycosis and Histoplasmosis), Opportunistic mycosis. General properties of fungal diagnosis, rapid diagnosis, methods of collection of samples, antifungal agents.

7. Immunology

Antigen antibody reactions, human diseases in relation to defects in complement system. Basic principles of immunity. Immunobiology of lymphoid organs and tissues. Antigens and antibody reactions with relevance to pathogenesis and serological diagnosis. Cell mediated immunity and their role in immunity. Immunology of hypersensitivity. Measuring immune functions. Immunological basis of the autoimmune phenomena of infections aeriology. Immunodeficiency with relevance to opportunistic infections. Basic principles of transplantation immunity. Basic principles of tumour immunity.

National Immunization Programmes. Immunoprophylaxis. Nature of vaccines. Rationale of vaccines and dosage. Principles of immunization.

8. Parasitology

Intestinal gut protozoa. Protozoans in blood: Homoflagellates, Plasmodia. AcanthamoebaPneumocystis, miscellaneous sporozoa, toxoplasma, genital protozoans. Trematodes, Cestodes, Nematodes, medical entomology with reference to vectors.

9. Entomology

Roll of flies, mosquitoes, ticks, mites, lice and fleas in various human infections.

Practicals

1. General Microbiology and Bacteriology

(a) Demonstration of bacterial culture methods and process of sterilisation and disinfection.

(b) Media making, preparation of smears, Gram staining, motility, staining for acid fast bacilli (ZN staining), demonstration of bacterial capsule, spore, metachromatic granules.

(c) Identification of pathogenic bacteria by routine biochemical and special diagnostic tests.

2. Immunology

(a) Application of agglutination reaction i.e. Widal test for enteric fever, blood grouping, latex slide agglutination test for RA factor, Rose Waaler test for RA factor.

(b) Application of precipitation tests i.e. VDRL test, RPR test, Ouchterlony's double gel diffusion technique.

(c) TPHA (Treponema pallidum haemagglutination test)

(d) CFT (Complement fixation test)

(e) ELISA test for HbsAg, HIV & HCV
(f) Anti Streptolysin-O-test (ASO)
(g) Immunofluorescence test

3. Parasitology

(a) Medical Entomology
(b) Stool examination for demonstration of trophozoites and cysts of protozoa including Entamoeba histolytica, Entamoeba coli, Giardia intestinalis Promastigote and amastigote forms of Leishmania donovani.
(c) Demonstration of parastic ova by direct & concentration methods. (d) Examination of blood smears (both thin films and thick films.)
(e) NNN medium, NIH medium for cultivation of various protozoa.

Skills

At the end of the Practical course, the student is expected to know

- Preparation of wet mounts, iodine mounts, hanging drop preparation, KOH mount for fungi, simple bacterial stain; differential stain; Gram stains; Albert's stain, Ziehl Neelsen's stain.
- Basic principle and interpretation of various immunological/serological tests.
- Interpretation of the Antimicrobial susceptibility test.
- Collection, transport and processing of various samples like blood, pus, urine, CSF, body fluids, stool, sputum, throat swabs and serum for microbiological investigations.
- Expected to know how to prepare peripheral blood smear and stain with Giemsa staining for the demonstration or parasites.

Suggested Books :

(j) Medical Microbiology – Mackie & MC Cartney.
(ii) Principles of Bacteriology, Virology & Immunity - Topley & Wilson (Available in 5 Volumes).
(iii) Medical Microbiology – Jawetz.
(iv) Text book of Microbiology : D.R. Arora
(v) Medical Parasitology : D.R. Arora
(vi) Bacteriology – Ananthnarayan
(vii) Parasitology - Chatterjee

FINAL PROFESSIONAL MBBS (PART-I)

COMMUNITY MEDICINE

(i) Goal :

The goal of teaching community medicine is to prepare the students to function as community physician and family doctor.

(ii) Objectives

(A) Knowledge

At the end of the course, the student shall be able to :-

(1) Outline the demographic pattern of the country and appreciate the roles of the individual, family, community and socio-cultural milieu in health and disease.

(2) Apply biostatistical methods and techniques.

(3) Be aware of the physical, social, psychological and economic aspect of health and diseases.

(4) To appreciate the impact of urbanization on health and disease.

(5) To understand the principles and methods of information, education and communication and its implementation.

(6) Identify the environmental and occupational hazards and their control; Describe the importance of sanitation in human health.

(7) List epidemiological methods and describe their application to communicable and noncommunicable diseases in the community or hospital set up.

(8) Be able to promote community participation especially in areas of disease control, health education and implementation of national programmes.

(9) Describe the National Health Programmes with particular emphasis on maternal and child health programmes, family welfare planning and population control.

(10) Describe the health care delivery system including available health services for rehabilitation of the disabled in the country.

(11) Enunciate the principles and components of primary health care and the national health policies to achieve the goal of health for all.

(12) Work as an effective member of the health team. He should be able to help to coordinate and supervise other members of the health team and maintain liaison with other agencies.

(13) Observe the practice of principles of preventive medicine in hospital and community setting.

(B) Skill :

At the end of course, the student shall be able to:

1. Plan, collect, analyze, interpret and present data from a hospital/ community survey.
2. Select and utilize simple statistical methods for the analysis, interpretation and presentation of data.
3. Define, calculate and interpret bio-statistical measures.
4. Describe the demographic pattern of the country.
5. Plan, implement & the use of simple audio–visual (A-V) aids.
6. Describe environmental hazards : inside and outside the home.
7. Define and analyze the importance of water and sanitation in human health.
8. Suggest feasible methods of environmental control.
9. Describe common occupational hazards in industries, agriculture and other occupational settings.
10. Describe feasible methods of control of occupational hazards.
11. Describe the epidemiological methods.
12. Use epidemiological tools to make rational decisions relevant at the individual and community levels.
13. Describe the health information system in India with reference to the management information system, Census and Vital Statistics Registration.
14. Diagnose and manage common nutritional problems at the individual and community levels.
15. Diagnose and manage maternal and child health problems and advise couple & the community on the family planning methods by applying cafetaria approach.
16. Describe the school health programme.
17. Describe the principles of Primary Health Care and other related concepts.
18. List the goals/targets set to achieve Health for All by 2000 AD.
19. Describe the health care delivery system in India.
20. Plan and implement an intervention programme with community participation.
21. Interact with other members of the health care team and participate in the organization of health care services and implementation of National Health Programmes.

22. Describe and analyse the roles of individual, family, community and socio-cultural milieu in health and disease.
23. Apply epidemiological methods to control communicable and non-communicable diseases in the hospital and community set up.

24. Describe the important/ common health problems of India.
25. Describe and evaluate the National Health Programmes.
26. Plan and implement measures for disaster management.
27. Diagnose and manage common health problems and emergencies at the individual, family and community levels keeping in mind the existing health care resources, prevailing socio-cultural beliefs and family resources.

First Professional (Pre Clinical)

Theory

I. Concepts of Health and Disease

- Definition of health
- Dimensions and determinants of health
- Indicators of health
- Epidemiological triad
- Theories of disease causation
- Natural history of disease
- Risk factor concept
- Concept of control of disease
- Levels of prevention
- Modes of intervention
- Primary Health Care-Introduction

II. Behavioural Sciences

(a) Elementary Course in Sociology

- Definition, style of family, community
- Role of family in health and disease
- Cultural factors influencing health and disease in urban, rural and slums settings
- Social organization and community participation

- Measurement of the socio-economic status of a family and its importance in health and disease
- Impact of urbanization on health and disease
- Interview techniques
- Methods of social research in relation to health
- To develop a good doctor–patient relationship
- Role of Medical Social Worker in health care

(b) Elementary Cause in Psychology

- Definition of Psychology
- Factors affecting behaviour and attitude
- Attitude, nature, development
- Puberty and adolescence
- Behaviour problems
- Sexual behaviour
- Normal and abnormal behaviours
- Implications of behaviour in illness
- Methods to change attitude, behaviour, measurement of attitudes
- Interpersonal relationship
- Role and role conflicts
- The need for counselling in various situations (e.g. HIV/AIDS affected person) Proper approach and attitude of counsellor
- Communication skills required of a counsellor.

(c) Health Education

III. Biostatistics

- Introduction
- Biostatistics in Medicine
- Statistical methods
- Frequency distribution
- Measures of Central tendency
- Proportions
- Presentation of statistical data
- Tables : Simple and frequency distribution tables
- Charts and diagrams: Bar, Histogram, Frequency polygon, Line diagram :**Pie**-chart, Pictogram etc.
- Probability
- Normal distribution

- Estimation of standard error
- Confidence interval
- Tests of significance
- Bias and random error
- Samples size calculation
- Sampling
- Variability
- Use of computer in health and disease

IV. Demography

- Importance of demography
- Demographic cycle
- World population trends : Regional differences
- Birth and death rates
  Growth rates etc.
- Demographic trends of the country : Age and sex composition,
- Age determinants
- Sex ratio, Density of population, Family size,
- Urbanization, Literacy, Life expectancy etc.
- Fertility : Determinants of fertility: biological and behavioural determinants
- Fertility related statistics
- Effect on population of changes in birth.
- Death and growth rates
- Vital statistics and their method of collection : Census, Registration of vital events, Hospital records, population surveys etc.
- Standardization of Death Rates
- Life Table
- Introduction to International classification of disease

Practicals : Ist Professional

(1) Visit to rural, slum areas to get familiar with their living conditions

(2) To get familiar with demographic pattern of rural & slum areas by conducting a survey.

(3) Visit to social establishments like old-age home. Rehabilitation centre for blind, deaf and dumb etc.

(4) Stimulated exercises in class-room e.g. role play, PBL.s, PSEs.

(5) To familiarize with health delivery care system by visiting, Sub Centre, Primary Health Centre & Anganwadi

(6) Calculate various statistical measures using data form hospital or community

Teaching Methods To Be Used

- Lectures
- Small Group discussion
- Classroom practicals
- Demonstration
- Visits to health agencies & community
- Conducting surveys
- Simulated Exercises i.e. problems solving exercises (PSEs)
- Problem based learning (PBLs)
- Mediquiz

II Professional (Paraclinical)

Theory

(I) Environment and Health

- Concepts of Ecology : air, ventilation, atmospheric pollution, heating and lighting.
- Sources of water; sanitary well water borne diseases, water purification, storage and distribution, standards of purity, bacteriological tests, swimming pool sanitation.
- Disposal of Wastes : Excreta, refuse, sludge, water, animal dung etc. methods and appliances suitable for urban and rural areas.
- Housing and health, village and town planning, sanitation in camps Importance of personal hygiene

(II) Nutrition

- Nutrients, their sources, and functions, nutritive value of common foodstuffs, nutritional requirements at different periods of life, balanced diet, common deficiency diseases, assessment of nutritional status, food poisoning and food-borne disease.
- Milk, meat hygiene
- Magnitude of nutritional problems in India
- National nutritional health policy

- National nutritional programmes.

(III) Entomology

- Life history of insects of medical importance, diseases spread by them, and their integrated control Disinfection – Principles, methods.

(IV) Mother and Child Health

Maternal Health

- Magnitude of the problem
- Maternal morbidity - definition, causes and factors, rate
- Maternal mortality
- Antenatal, natal and post-natal care
- Concept of high risk approach
- Local customs, practices, beliefs, beliefs during pregnancy, childbirth and lactation.

Child Health

- Magnitude of problem
- Morbidity and mortality - Causes and factors
- Under Five clinics
- Breast-feeding
- Indicators of MCH
- School health
- Child survival and safe motherhood programme
- Reproductive and child health programme
- Decentralised participating planning in Family Welfare

(V) Family Welfare

- Definition and concept
- Reasons of rapid growth of population in India
- Need for population control measure and national population policy
- Family planning methods - Type, advantages and short-comings
- Medical termination of pregnancy act
- National Family Welfare Programme in India

(VI) Public Health Administration

- Administration : Public health administration, comprehensive health care, delivery of health care, Planning management and evaluation

- National Health Policy

Explain the process of health planning in India by demonstrating awareness of:

- The health systems and health infrastructure at centre, state and district levels.
- The inter-relationship between community development block and primary health centre
- The organization, functions and staffing pattern of community health centres, primary health centre and sub-centre.
- The job descriptions of medical officer, health supervisor (Male and Female); health worker (male and female), villages health guide, anganwadi workers.
- The activities of the health team at the primary health centre.
  - Primary health care.
  - Voluntary agencies in health care.
  - Health Economics

(VII) Occupational Health

Working environment : Health hazards of industrial and agricultural workers

- Common occupational diseases
- Industrial toxic substances
- Principles of control of occupational diseases
- Legal aspects : Factory Act
- Employees State Insurance Scheme (ESI)

(VIII) General Epidemiology

- Definition of Epidemiology
- Uses of epidemiology in hospital, community and health planning
- Basic measures in epidemiology e.g. Rate, Ratio and Proportion
- Mortality : Concepts of Crude, Specific and Standardized death rates
- Morbidity : Concept of incidence and Prevalence of disease
- Significance of Time, Place and Person distribution in epidemiology
- Sources of epidemiological data.

Practical : II Professional

(I) Field Visits/Observation Visits/Demonstration

- To study water supply & water disinfection sewage disposal, drainage, sanitation of dairies, bakeries, abattoirs, housing conditions, hotels and restaurants, village sanitation, registration of birth and deaths etc., visit to a public health laboratory, a rehabilitation centre, medical record section of a hospital.
- Demonstration of various immunizing agents and cold chain equipment

- Contraceptives
- Disinfectants and insecticides
- Insects of medical importance
- Various food items
- Demonstration of sanitary well, health education material
- Iodine testing in salt

(II) Family Health Care

- To study social culture, economic, ecological factors affecting the health in the family. Family as a unit in the community.
- Multifactorial approach in causation of disease
- To assess the health knowledge of the family and to prepare health education material to guide the family
- To assess the nutritional status of the family
- Preventive health check-up of individual member, its importance and follow-up of the members.

Teaching Methods

- Didactic lectures
- Small Group discussion
- Demonstration
- Family study
- Simulated Exercises - Role Play, Problem Based Learning Medical Quiz.

Final Professional (Clinical)

Theory

(I) General Epidemiology

Concepts of causation of disease

- Epidemiological studies : Descriptive, Analytical and Experimental
- Basic concepts about transmission of infectious agents
- Principles of control of communicable diseases

- Principles of control of non-communicable diseases
- Investigation and control of an epidemic
- Epidemiological principles underlying screening
- Distinction between screening and diagnostic tests
    - Calculate sensitivity, Specificity, Positive predictive value etc. for screening tests
    - Immunity

(II) Specific Epidemiology

(a) **Communicable diseases**

- Water-borne and intestinal diseases
- Arthropod borne diseases
    - Zoonoses
- Surface/contact disease including STD and AIDS
- Respiratory diseases
- Worm Intestation

(b) **Non-Communicable diseases**

- Epidemiology and prevention of
- Coronary Heart disease
    - Hypertension
- Rheumatic lever and Rheumatic heart disease
    - Accidents
    - Cancers
    - Diabetes
    - Blindness
- Smoking and Alcohol in health and disease
- Extent of the problem, epidemiology and natural history of the diseases
- Relative public health importance of a particular disease in a given area
- Influence of social, cultural and ecological factors on the epidemiology of the diseases
- Control of communicable and non-communicable diseases by;
- Diagnosis and treating a case and in doing so demonstrate skill in : Clinical methods

(i) Use of essential laboratory techniques

(ii) Selection of appropriate treatment regimes

(iii) Follow-up of cases

- Principles of planning, implementing and evaluating control measures for the diseases at the community level bearing in mind the relative importance of the disease.
- Institution of programmes for the education of individuals and communities.
- Investigating a disease epidemic;
- Awareness of the National Disease Control Programmes.

(III) National Health Programmes

(IV) International Health

(V) Diaster Management

(VI) Adolescent Health

(VII) Geriatrics

Practicals : Final Professional

1. Continuation of family health care
2. Clinico-psycho-social case review in hospital, out patient, and in family
3. Visit to primary health centre, sub-centre, urban health centres
4. Visit and involvement, in providing health care to under five and antenatal clinic
5. To get familiarize with various national health programmes implemented in the community
6. Involvement in immunization services, health check-up camps, school health activities.

Teaching Methods

- Didactic Lectures
- Small Group discussions
  Visits, demonstrations
- Presentation by students

- Simulated Exercises - Role Play, Problem Based Learning, Medical Quiz.

Suggested Text Books

Parks's Textbook of Preventive & Social Medicine	:	K. Park
Methods in Biostatistics	:	B.K. Mahajan
Textbook of Community Medicine	:	A.P.Kulkarni, J.P. Baride
Epidemiology & Management for Health Care for All	:	P.V. Sathe, A.K. Sathe
Textbook of Preventive & Social Medicine	:	M.C. Gupta & B.K. Mahajan
Practical Community Medicine	:	A.S. Padda & S.S. Deepti

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OPHTHALMOLOGY

DEPARTMENTAL OBJECTIVES :

i) **GOAL**:

The broad goal of the teaching of students in ophthalmology is to provide such knowledge and skills to the students that shall enable him to practice as a clinical and as a primary eye care physician and also to function effectively as a community

health leader to assist in the implementation of National Programme for the prevention of blindness and rehabilitation of the visually impaired.

ii) **OBJECTIVES**

a. **KNOWLEDGE**

At the end of the course, the student should have knowledge of:

1. common problems affecting the eye:

2. principles of management of major ophthalmic emergencies

3. main systemic diseases affecting the eye

4. effects of local and systemic diseases on patient's vision and the necessary action required to minimise the sequalae of such diseases;

5. adverse drug reactions with special reference to ophthalmic manifestations;

6. magnitude of blindness in India and its main causes;

7. national programme of control of blindness and its implementation at various levels

8. eye care education for prevention of eye problems

9. role of primary health centre in organization of eye camps

10. organization of primary health care and the functioning of the ophthalmic assistant.

11. integration of the national programme for control of blindness with the other national health programmes;

12. eye bank organization

b. **SKILLS**:

At the end of the course, the student should be able to:

1. elicit a history pertinent to general health and ocular status;

2. assist in diagnostic procedures such as visual acuity testing, examination of eye, Schiotz tonometry, Staining for Corneal pathology, confrontation perimetry, Subjective refraction including correction of presbyopia and aphakia, direct ophthalmoscopy and conjunctival smear examination and Cover test.

3. diagnose and treat common problems affecting the eye;

4. interpret ophthalmic signs in relation to common systemic disorders;

5. assist/observe therapeutic procedures such as subconjunctival injection, Corneal/Conjunctival foreign body removal, Carbolic cautery for corneal ulcers, Nasolacrimal duct syringing and tarsorraphy;

6. provide first aid in major ophthalmic emergencies;
7. assist to organise community surveys for visual check up;

8. assist to organise primary eye care service through primary health centres;

9. use effective means of communication with the public and individual to motivate for surgery in cataract and for eye donation;

10. establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team.

c. INTEGRATION

The undergraduate training in Ophthalmology will provide an integrated approach towards other disciplines especially neurosciences, Otorhino-laryngology, General Surgery and Medicine.

At the end of the training in the subject of ophthalmology, a MBBS student should be able to :

1. Accurately record the vision of the patient.
2. Record intra-ocular pressure.
3. Identify and manage common ocular emergencies
   a. Remove foreign body of the cornea and from the conjunctival cul-de-sac
      i. Manage a patient with chemical and thermal injuries of the eye.
      ii. Preliminary examination and first aid to a patient of mechanical injuries (penetrating injuries and blunt injuries) to the eye
      iii. Identify and manage a case of acute congestive glaucoma or a case of phacomorphic glaucoma.
4. Identify and manage common diseases of Anterior segment of the eye and the adnexa like conjunctivitis, corneal ulcer, chalazion, stye, trichiasis, iridocyclitis, cataract and glaucoma.
5. Impart eye care education to the community.
6. Have knowledge of eye donation.
7. Corelate the effects of systemic diseases on the eye like Vitamin A deficiency, Rubella, AIDS, Hypertension Diabetes, Thyrotoxicosis, Meningitis, space occupying lesions.
8. Practice his profession within the framework of rules and regulations of the Government, Medical Council of India and State Medical Council.
9. Identify the national objectives and be an active participant in the national programme for control of prevention of blindness.

Should know

- Definition, Causes and Preventions of Blindness.
- National objectives of National Programme for control of blindness and prevention of blindness.
- During 4^{th} and 5^{th} year, lectures/demonstrations to be held to cover the following subjects :
- Anatomy, physiology and detailed study of the diseases of :
- Anterior segment
- Lids
- Congenital anomalies

- Blepharitis
- Hordeolum externum
- Hordeolum internum
- Chalazion
- Trichiasis
- Entropion
- Ectropion
- Ptosis
- Tumours

ORBIT

- Proptosis
- Orbital cellulitis
- Cavernous sinus thrombosis

LACRIMAL APPARATUS

- Dry eye
- Epiphora
- Dacrocystitis

CONJUNCTIVA

- Conjunctivitis
  - Bacterial Conjunctivitis
  - Chlamydial Conjunctivitis (Trachoma)
- Allergic Conjunctivitis
  - Vernal Keratoconjunctivitis
  - Phlyctenular Keratoconjunctivitis
- Ophthalmia Neonatorum
  - Degenerative Conditions
    - Pinguecula
    - Pterygium
  - Xerosis of Conjunctiva
  - D/d of the nodules at the limbus

CORNEA

- Corneal Ulcer
  - Bacterial
  - Fungal
  - Viral

- Herpes Zoster Ophthalmicus
- Irophic Cornea Ulcer
- Neuroparalytic Keratitis
- Exposure Keratitis
- Mooren's Keratitis
- Superficial Punctate Keratitis
- Photo-ophthalmia
- Interstitial Keratitis
- Corneal Degenerations
- Arcus Senilis
- Band keratopathy
- Corneal Dystrophies
- Keratoconus
- Keratoglobus
- Corneal Opacities
- Vascularization of Cornea
- Effects of Corneal Perforation
- Keratoplasty
    - Types
    - Indications
- Methods of Corneal Preservation

SCLERA

- Episclerities
- Scleritis
- Staphylomas

UVEAL TRACT

- Congenital Anomalis
- Anterior Uveitis (Iridocyclitis)

- Sympathatic ophthalmitis
  D/d of Red eye.
- LENS
    - Cataract
        - Congential Cataract
        - Developmental Cataract

- Acquired Cataract
- Senile Cataract
- Metabolic Cataract
- Complicated Cataract
- Toxic Cataract
- Radiational Cataract
- Traumatic Cataract

- Investigations, operative procedures and complications of Cataract
- Aphakia, its handicaps and management

GLUCOMA

- Congenital Glucoma
- Primary Open Angle Glucoma
- Narrow Angle Glucoma
- Secondary Glucoma

ERRORS OF REFRACTION

- Causes of eye strain
- Hypermetropia
- Myopia
- Astigmatism
- Accommodation and its Anomalies

MUSCULAR ANAMOLIES

- Heterophoria
- Esotropia
- Exotropia
- Paralytic Squint

RETINA AND OPTIC NERVE

- Hypertensive Retinopathy
- Diabetic Retinopathy
- Retinal Detachment
- Retinoblastoma
- Papilloedema
- Optic Neuritis
- Optric/autrophy

MISCELLANEOUS

- Medical ophthalmology, injuries of eye and orbit.

- Blindness-causes.
- Community ophthalmology

OCULAR INJURIES

- Mechanical injuries
- Penetrating injuries
- Penetrating injuries with retained
- Intraocular foreign bodies
- Blunt Trauma
- Chemical injuries
- Acid, Alkali Burns
- Demonstrations of methods of examination, i.e. oblique illumination, direct ophthalmoscopy, distant direct opthalmoscopy, indirect ophthalmoscopy, retinoscopy, their theoretical aspects and actual practice of these procedures.
- Discussion of diseases given in all the sections under "Theory".
- Identification and uses of varius instruments used for anterior segment.
- Diagnostic procedures like recording of vision, intra-ocular pressure, perimetry, bjerrum screen, etc.
- investigation of lacrimal apparatus and tests like Cover test, Maddox Rod, Maddox wing.

OTORHINOLARYNGOLOGY

OBJECTIVES

- **KNOWLEDGE**

At the end of the course, the student shall able to:

describe the basic pathophysiology of common ear, nose and throat (ENT) disease and emergencies;

adopt the rational use of commonly used drugs, keeping in mind their adverse reactions; suggest common investigative procedures and their interpretation.

SKILLS At the end of the course, the student shall be able to:

examine and diagnose common ear, nose and throat (ENT) problems including the premalignant and malignant disorders of the head and neck;

manage ear, nose and throat (ENT) problems at the first level of care and be able to refer whenever necessary.

assist/carry out minor surgical procedures like syringing, ear dressing, nasal packing etc. Assist in certain procedures such as tracheostomy, endoscopies and removal of foreign bodies.

INTEGRATION

The undergraduate training in ear, nose and throat (ENT) will provide an integrated approach towards other disciplines, especially Neurosciences, Ophthalmology and General Surgery.

OTO-RHINO-LARYNGOLOGY

i) GOAL:

The broad goal of the teaching of undergraduate students in Otorhinolaryngology is that the undergraduate student have acquired adequate knowledge and skills for optimally dealing with common disorders and emergencies and principles of rehabilitation of the impaired hearing.

ii) OBJECTIVES

a. **KNOWLEDGE**

At the end of the course, the student should be able to:

1. describe the basic pathophysiology of common ENT diseases and emergencies.

2. adopt the rational use of commonly used drugs, keeping in mind their adverse reactions.

3. suggest common investigative procedures and their interpretation.

b. **SKILLS**

At the end of the course, the student should be able to:

1. examine and diagnose common ENT problems including the pre-malignant and malignant disorders of the head and neck.

2. manage ENT problems at the first level of care and be able to refer whenever necessary.

3. Assist/carry out minor surgical procedures like ear syringing, ear dressings, nasal packing etc.

4. assist in certain procedures such as tracheostomy, endoscopies and removal of foreign bodies.

c. **INTEGRATION:**

The undergraduate training in ENT will provide an integrated approach towards other disciplines especially neurosciences

SYLLABUS

Must know

- Anatomy of outer and middle ear.

- Turning fork tests and how to differentiate between conductive and sensorineural deafness.
- Classification of chronic suppurative otitis media.

  Pathogenesis of safe and unsafe chronic suppurative ear.
- Principles of management of CSOM.
- Complications of CSOM and their management. Otospongiosis.
  - Non secretory otitis media. Acute suppurative otitis media
  - Acute mastoiditis and its treatment.
  - Underlying principles of myringoplasty, ossiculoplasty,
  - tympanoplasty, radical and modified radical mastoidectomy.

  No need to know details of the operative procedure.
- Diseases of external ear and pinna including wax, furunculosis.
- Foreign body in ear
- Tinnitus

Desirable to know

- Anatomy of inner ear.
- Physiology of hearing
- Pure tone audiometry
- Adhesive otitis media
- Prevention of deafness
- Tumours of temporal bone-acoustic neuroma
- Causes of facial paralysis; topodiagnosis and management
- Otomycosis and Otitis externa.
- Causes of tubal dysfunction
- Caloric test : interpretations.
- Clinical evaluation of a case vertigo.
- Meniere's disease : Pathogenesis and management

Common causes of vertigo and their management

- Congenital anomalies of the ear.
- Impedance audiometry
- Basic principles of hearing aids and cochlear implants.

Nice to know

- Assessment of eustachian tube function
- Causes of sensorineural deafness and their management
- Brainstem auditory evoked response audiomotry

- Electronystagmography

RHINOLOGY

Must know

- Anatomy of nose and paranasal sinuses
- Acute and Chronic sinusitis. Nasal polypi
- Foreign body of the nose
- Rhinosporiodiosis
- Deviated nasal septum
- Perforation, hematoma of septum
- Acute rhinitis
- Atrophic rhinitis
- Nasal allergy and its management
- Epistaxis; causes and management
- Differential diagnosis of a maxillary swelling and of a mass in a nasal cavity.

Desirable to know

- Physiology of nose and paranasal sinuses
- Osteomyelitis in Otolaryngology ad fungal granuloma
- Mucocele
- Chronic rhinitis
- Emergency management of Maxillofacial trauma
- Malignant tumors of the maxilla - management

Nice to know

- Nasal deformities and their management including principles of rhinoplasty (Excluding details of operative techniques).
- Vasomotor rhinopathy
- CSF rhinorrhoea
- Principles of Functional Endoscopic Surgery (FESS)

LARYNGOLOGY

Must know

- Anatomy of larynx, pharynx (naso-, oro- and hypopharynx, Anatomy of tonsils and adenoids. Inflammatory adofnoid and tonsillar losions. Indications, contraindications and operative procedure of an adenoidectomy and tonsillectomy. Post-operative complications and their management. Peritonsillar abscess, diphtheria. Differential diagnosis of a membranous tonsillitis its management.
- Tracheostomy : Indications, operative procedure, post-opeartive care, complications and their management.
- Respiratory obstruction in Adults and its management.
- Acute inflammatory states of the larynx.
- Acute laryngitis, laryngotra, heebronchitis, acute opiglottitis.
- Malignant tumours of the larynx.
- Vocal nodules and polyps.
- Tuberculosis
- Thrush/oral manifestation of AIDS.

Desirable to know

- Differential diagnosis of respiratory obstruction in new born.
- Laryngopharyngeal trauma and its management
- Malignant tumours of hypopharynx and oropharynx
- Papillomatosis
- Nasopharyngeal tumours (angiofibroma, nasopharyngeal carcinoma)
- Anatomy of oesophagus and tracheobronchial tree carcinoma of upper oesophagus, achalasia, Strictures Endoscopy of oesophagus and tracheobronchial tree Foreign bodies.
- Anatomy of neck spaces. Infections of retropharyngeal space and parapharyngeal space. Ludwing's angina.
- Ulcerative, bullous and white lesions of oral cavity and oropharynx.
- Early signs/symptoms of carcinoma oral cavity.

Nice to know

- Pharyngeal diverticulum

- Laryngocele
- Syphilis and leucoplakia of larynx
- Globus hystericus
- Tumours of the para pharyngeal space
- Chordoma, Tornwaldt's cyst

  Anatomy of the orbit. Differential diagnosis of proptosis and its management. Management of the orbit in secondary involvement by paranasal sinus diseases (both inflammatory and neoplastic).

GENERAL

Must know

Role of the following modalities in ENT diseases.

Radiotherapy

Cryosurgery

Laser

Desirable to know

- Differential diagnosis and approach to management of

  Swelling in the neck

  Salivery gland diseases

  Thyroid swelling

Note : Student need not know

- Operative details of all operations except tracheontomy.
  - Names, uses and other details of intruments other than those required for clinical examination of Patients (i.e. tongue depressor, Thudicum's nasal speculum, aural speculum, indirect laryngoscopy and posterior rhinoscopy, mirrors, tuning fork, head mirror).

Suggested Books :

Logan Turner's Diseases of the Nose, Throat and Ear

Diseases of Ear, Nose and Throat : P.L. Dhingra

A short text book of ENT diseases : K.B. Bhargava
Short text book of ENT : Santanu Bhanerjee

Text book of ENT : D.S. Grewal

MEDICINE

Departmental objectives

At the end of three clinical postings, the medical student will :

1. Be able to evaluate each patient as a person in Society and not a collection of organ systems.

2. Have developed an interest in and care for all types of patients.

3. Be able to guide the patient through an illness and handle the various emotions (hopes and fears) in the patient, his attendants and in himself.

4. Possess adequate knowledge in the SCIENCE of Medicine and be able to :

i. Elicit a good clinical history

ii. Perform a thorough and methodical clinical examination.

iii. Elucidate the clinical problem with particular emphasis on the dominant one.

iv. Analyse and synthesize the information to form a differential diagnosis and hypothesize a syndrome.

v. Discuss the laboratory test/investigations that may be helpful to (iv) above.

vi. Outline the steps in the management of various diseases.

vii. Base the diagnosis and management on knowledge gained in basic, paraclinical and clinical medicine.

viii. Responsibility pursue new knowledge that can be used for the good of the patient.

ix. Provide competent medical care initially in all medical emergencies.

x. Refer medical problems to secondary and tertiary care when indicated.

5. Have an understanding of the ART of Medicine involving :

i. Effective communication with the patient.

ii. Empathy. iii. Understanding the socioeconomic status of the patient in relation to management. iv. Patient and family health education.

6. Learn to be adaptable.

i. To new ideas.

ii. To new situations with cost and resource restraints.

7. Possess knowledge of certain procedures.

8. Be able to function as a member of a health care team.

9. Understand the ethical and legal implications of medical decision in thecontext of Consumer Protection Act.

10. Possess Skills :

i. Clinical and procedural skills in terms of history, clinical examinations, ability to perform simple bedside tests eg. Hemoglobin, TLC, DLC, preparation of films for peripheral blood smear examination, urine examination for glucose, Albumin, Bence Jones proteins and stool examination, including for occult blood, bleeding time, clotting time and Hess test : Diagnostic and therapeutic procedures relevant to common emergencies.

ii. Diagnostic and therapeutic decision making skills at primary care level.

iii. Communication skills : a) Talking to patients and relatives regarding disease, natural history and management advice.

b) Ability to convey meaningful information to other members of the health care team as well as writing a referral note to secondary and tertiary care centres.

iv. Managerial skills : Leadership, time-management, team building, simple stock and inventory relevant to managing primary health centre or general practice health issues, doctors role in disasters in India.

v. Attitude and Value concern skills :

(a) Ethical Behaviour

(b) Keep patients welfare foremost to provide quality care as well as to avoid consumer initiated legal problems.

(c) Develop holistic view of medicine taking social and cultural factors in each case.

(d) Possess positive attitude to pursue self-directed learning and keeping abreast with recent advances.

I. General

1. Must know

(e) **Genetic disorders :** Molecular basis of genetics genes, mutation, DNA analysis, Chromosomes,

Genetic disorders : Chromosomal disorders ; number and structure;

Single gene defects : Autosomal dominant, recessive and sex-linked disorders.

Multifactorial inheritance.

Clinical genetics, genetic counselling prenatal diagnosis : avoidance, control and treatment of genetic disorders.

Gene therapy

Ethics

(b) **Physical and sports medicine :** Common sports related problems, initial management and role of physiotherapy.

(c) **Geriatric medicine :** Principles, physiologic changes, clinical examination, mental state exam., functional capacity, management of common problems. Drug prescribing in elderly. Prevention.

(d) **Disaster medicine :** Triage and rapid assessment. Initial management.

II. Infectious diseases

I. Must know :

(a) Emergence of new infections, resistance mechanisms, chemotherapy, vaccination, Prophylaxis. Notifiable diseases.

(b) Clinical infectious diseases under the headings :

Etiology, pathophysiology, pathology, clinical features, diagnosis, laboratory investigations, management, complications, prevention.

(i) Bacterial infections

Gram positive cocci	:	Steptococcus :Scarlet fever (Acute rheumatic fever, Acute glomerulonephritis), Pneumococcus Staphylococcus : Discuss Methicillin Resistant Staphylococcus aureus. Food poisoning Toxic shock Hospital infections
Gram positive bacilli	:	Diphtheria Letanus (Pseudomembranous colitis)
Gram negative cocci	:	Meningococcus Gonococcus Discuss meningitis and sexually transmitted diseases)
Gram negative bacilli	:	H. influenzae E.coli (UTI) Proteus Pseudomonas Klebsiella Typhoid Bacillary dysentry Cholera (Discuss urinary tract infection, enteric fever and diarrhoeas)
Mycobacterial infection	:	Tuberculosis Leprosy (Significance of Radiology, Sputum exam. and Mantoux in T.B. and National Programmes)
Spirochaetas	:	Syphilis

(ii) Viral infection

DNA viruses	:	Chickenpox, Zoster H. simplex

RNA viruses	:	Adult Poliomyelitis Measles Mumps Influenza Rabies Encephalitis (Japanese) HIV virus.
Hepatitis Viruse	:	To discuss in Hepatobiliary system
(iii) Fungal infections	:	Aspergillus Cryptococcus Candidiasis
(iv) Protozoal infections	:	Leishmaniasis (Visceral) Malaria Amoebiasis Giardiasis (Special emphasis on reservoirs, vectors, life cycles, prevention).
(v) Helminthiasis	:	Filaria Intestinal Nematodes : Hookworm, Roundworm, Whipworm, Thread worm Intestinal Cestode : Taenia, saginata, solium, Cysticercosis, Hydatid disease.

2. Desirable to know

i.	Bacterial	:	Gas gangrene, Botulism, Anthrax, Brucellosis Bacteroides, Actinomycosis, Pertussis.
ii.	Viruses	:	Herpes simplex virus, Ebstein-Barr virus Rubella, Dengue yellow fever.

iii. Others : Rickettsia, Chlamydiae, Mycoplasma, Pneumocystis, Trichomonas.

iv. **Nice to know** : Listeria, B. cereus, Legionairres disease, Helicobacter,

Leptospirosis, Lyme disease.

III Respiratory System

I. Must know

(a) Introduction : Symptoms, history taking, personal, occupational,

- family history.
- Examination of the respiratory system:
- Inspection, palpation, percussion, auscultation.
- General physical exam : Cyanosis, clubbing, Respiratory rate, asterexis, tremors (drug) Investigation : Sputum examination.
- Radiology
- Pulmonary function tests : Chronic obstructive
- Airway, disease, restrictive disease,
- Bronchial asthma
- Bronchoscopy
- Skin tests
- Identification : Pleural biopsy needle
- Interpretation : Chest X-rays
- Pleural fluid analysis

(b) Respiratory tract infections : Upper and lower respiratory tract infections : Pneumonias : Definition, classification, aetiologic agents, predisposing factors, clinical presentation,

Complications, investigation, management Clinical examination : emphasis on vocal fremitus, percussion, resonance, bronchial breath sounds.

(c) Chronic obstructive airway disease : Chronic Bronchitis and Emphysema : Definition, epidemiology, aetio-pathogenesis, pathology, clinical features, complications, investigations, diagnosis, treatment, prevention, prognosis.

Clinical examination : recognition of acute exacerbation, clinical signs of carbon dioxide narcosis, resonance over heart, liver, use of accessory muscles, typical habitus, flaps (asterexis).

Decision to hospitalize, ventilate.
Interpretation : Common pulmonary function tests, and arterial blood gases.

(d) Bronchiectasis and abscess : Definition, pathogenesis, predisposing, conditions, lung clinical features, investigations, treatment, complications.

Clinical examination : Clubbing, course crepts
Urine examination for albumin
Role of postural drainage and surgery

(e) Bronchial asthma : Definition, pathogenesis, predisposing, precipitating factors, clinical features, investigations, treatment, education.

Status asthmaticus and management.
Clinical Examination : Accessory, Rhonchi, cyanosis, muscles
Role of peak flow meters, use of nebulisers, metered dose inhaler.

(f) Pleural diseases : Pleurisy, Pleural effusion, Empyema, Pneumothorax,

Definitions, aetiopathogenesis, predisposing factors, clinical features.
Diagnosis : Radiology
Paracentesis : diagnostic, therapeutic
Treatment : Emphyema : Tube drainage

Pleurodesis

Clinical examination : Hyper resonant, dull note, shifting dullness, sucussion splash, bronchophony, aegophony, amphoric breath sounds, whispering pectoriloquoy, Pleural rub.

(g) Respiratory failure : Typical acid base disorders, hypoxemia, hypercarbia,

respiratory acidosis and alkalosis

Type I and II Respiratory Failure :

Definition, aetiology, pathogenesis, predisposing factors, clinical features, investigation, management Special emphasis on Cor pulmonale, ARDS.

- Tumors : Bronchogenic carcinoma : Introduction, aetiology,

pathology, clinical features; metastasis (in brief), staging, investigations, treatment, prognosis, prevention.

(h) Pulmonary : Predisposing factors, Acute cor pulmonale, symptoms, embolism/infarction signs, diagnosis, management, prevention.

2. Desirable to know

(a) Intersitial lung disease : Brief discussion : Definition aetiopathogenesis, clinical features, diagnosis, management, prognosis.

(b) Occupational lung disease : Definition, magnitude of the problem with special emphasis on pathogenesis, predisposing factors, (Pneumoconiosis, prevention; clinical features, investigation and treatment. Silicosis, Asbestosis)

(c) Pulmonary eosinophilia : Significance in India aetiology, pathology, clinical features, diagnosis, treatment. Emphasis on tropical cosinophilic syndroms and allergic bronchopulmonary aspergillosis.

(d) Superior Vena cava : Aetiology, clinical features, diagnosis and differential syndrome diagnosis, management.

(e) Sleep apnoea Syndrome : Brief knowledge of aetiology, predisposing factors, clinical features, diagnosis, management.

(f) Non metastatic complication of Bronchogenic Carcinoma

(g) Malignancy : Mesothelioma

3. Nice to know

Diaphragmatic paralysis, Eventration.

IV. Cardiovascular System

1. Must know :

1. Evaluation : Approach to patient with heart disease

2. Examination of Cardiovascular System : Physical signs.

3. Diagnostic methods : ECG, X-ray, Echocardiography

4. Coronary artery : Definition, pathogenesis, predisposing conditions, clinical features, disease investigations and treatment.

5. Rheumatic fever : Definition, pathogenesis, etiology, clinical features, investigations, treatment and prophylaxis.

6. Valvular heart disease : Etiology, pathophysiology, clinical features, investigations and management of mitral stenosis, mitral regurgitation, aortic stenosis, aortic regurgitation.

Demonstration : Heart sounds, murmurs, additional sounds.

7. Infective endocarditis : Etiology, pathophysiology, clinical features, investigations, complications, management and prophylaxis.

Demonstration : Peripheral signs of infective endocarditis.

8. Hypertension : Definition, classification, pathophysiology, etiology and predisposing factors, clinical features, investigations, complications, management.

Demonstration : Measurement of blood pressure and postural variation.

9. Congestive cardiac failure : Definition, pathophysiology, etiology, clinical features, types, investigations and management.

Demonstration : JVP, pedal oedema, basal rales, S_3 gallop, hepatomegaly.

10. Common congenital heart diseases in Adolescent and adults : Patent ductus arteriosus, Atrial septal defect, Ventricular septal defect, Tetralogy of Fallot, Eisenmenger's syndrome. Their pathogenesis, clinical features, investigations and treatment.

11. Common cardiac arrhythmias : Causes, clinical manifestations and management of atrial fibrillation and flutter, paroxysmal supraventricular tachycardia, sick sinus syndrome, AV blocks, WPW syndrome, ventricular ectopics, ventricular tachycardia and ventricular fibrillation, asystole.

12. Pericardial diseases : Etiology, pathogenesis, clinical features, investigations and treatment of : pericarditis, pericardial effusion, cardiac tamponade.

13. Cardiomyopathies, types : Types clinical features and treatment.

14. Atherosclerosis and diseases : Definition, pathogenesis, predisposing factors, clinical features, peripheral vascular investigations and management.

15. Deep venous thrombosis & prevention. Pulmonary thromboembolism : Predisposing factors, clinical features, diagnosis, management and

v. Gastrointestinal tract

1. Must know

(a) Introduction : Common symptoms : dysphagia, dyspepsia, heart burn, flatulence, hiccups, vomiting, diarrhoea, constipation, steatorrhoea, Rectal bleeding, tenesmus, weight loss.
Abdominal pain : indication for admission
Clinical examination : Relevant GPE, Inspection, palpation, percussion, Ausculation, PR, examination, Role of Indoscopy sigmoidoscopy, stool examination , plain X-ray, barium swallow, meal, fallow through, enteroclysis, enema; Ultrasound, CT Scan, Radio nuclide (In brief).

(b)	Oral/Oesophageal disease	:	Common lesions of the mouth : Infective, non infective disease, Carcinoma. Clinical examination of tongue, gums and their significance. Oral lesions characteristics of AIDS. Diseases of Salivary glands : Mumps, Xerostomia. Oesophageal disorders : Symptoms, signs, investigations (Manometry, Bernstein test, pH, barium swallow.) Achalasia, stricture, Mallory-Weiss, reflux, Carcinoma Aetiology, clinical features, investigation, management. Corrosive poisonings; Approach to management.
(c)	Stomach & Duodenum	:	Physiology and Function Gastritis, acute and chronic, erosions, ulcers. Peptic ulcer disease : Definition, epidemiology, aetiology (including a reference to H. Pylori and its role), pathology, clinical features, investigations, complication, treatment : (dietary, medical and surgical). Post-operative problems in brief. Gastric tumors : Benign : Malignant : Epidemiology, pre-cancerous, aetiology, pathology, clinical features, investigation, treatment, screening. Acute upper gastrointestinal bleeding : Aetiology,diagnosis, management.

(d)	Small Intestine	:	Physiology and function. Cliniocal features of small intestine disease, signs on general physical examination. Investigtions: fecal fat, D-Xylose, Lactose tolerance, Schillings, breath tests, Pancreatic tests, biopsy, Small bowel follow through, auto antibodies. The approach to Malabsorption : Aetiology, clinical features, diagnosis, investigations, treatment, complications. (Coeliac disease, tropical sprue, Whipple's Bacterial overgrowth) Tumours of small intestine, carcinoid.
(e)	Inflammatory Bowel disease (Crohn's and ulcerative colitis)	:	Incidence epidemiology, aetiology, pathology, clinical features, complications, extra-intestinal manifestations, investigations, diagnosis. Management : Medical, surgical, course, prognosis.
(f)	Dysentry/Diarrhoea	:	Definition, aetiology, pathology, clinical features with special reference to Shigella, Salmonella, cholera, amoebiasis; differential diagnosis amoebic vs bacillary: Management, complications.
(g)	Colonic disease and rectum	:	Diverticulosis : Definition, aetiology, apthology, Clinical features; Diagnosis, treatment and complications. Constipation : Common causes and its treatment Colonic polyps : Clinical diagnosis, surveillance and syndromes. Colorectal carcinoma : Epidemiology, Aetiology, Pathology, clinical features, investigation, diagnosis and treatment.

I. Hepatobiliary System

1. Must Know

Introduction :

(a) Functions of the liver : Protein, carbohydrates and lipid metabolism.

Investigations : Blood, imaging, biopsy

Special investigations : Radionuclide scan, ERCP, PTCA

(b) Jaundice : Clinical detection;

Prehapatic, Hepatic and Obstructive.

Acholuric jaundice, congenital hyperbiliribumenias

Acute hepatitis : Aetiology, pathology clinical features, investigation, complications, diagnosis, treatment, prognosis.

Different viral aetiologies of hepatitis including nature of virus, transmission, incubation period, pattern of liver disease, sequalae and diagnosis on the basis of serology.

Prevention Immunization

Fulminant hepatic failure : Definition, aetiology, histopathology, clinical features, diagnosis, treatment.

Role of Grades of Hepatic Coma, EEG, apraxia chart.

Non cirrhotic portal fibrosis in India.

(c) Chronic hepatitis : Definition, histopathology, clinical features, presentation, investigation, treatment, course and prognosis.

(d) Cirrhosis : Definition, aetiology, pathology, clinical features, investigations, role of Biopsy.

Compensated and Decompensated : Poor prognostic indicators; Child's grade;

Aetiopathogenesis of Portal hypertension : Ascites Pathophysiology, diagnosis, bacterial peritonitis, treatment.

Varices and upper gastrointestinal bleed and its management : Resuscitation of patients; endoscopy, medical, tamponade, surgery. Prevention of Rebleed.

Portosystemic encephalopathy : Definition, aetiology, patho physiology, precipitating factors, clinical features, diagnosis, management, prognosis.

Hepatorenal syndrome : Definition, Clinical features, Diagnosis and treatment.

(e) Budd Chiari Syndrome and Venoocclusive disease : Definition, aetiology, pathology, clinical features, diagnosis, treatment, prognosis.

(f) Liver Abscess:
Pyogenic and Amoebic : Aetiology, clinical features, diagnosis, investigations, treatment, complications, prognosis.

(g) Parasitic disease : Hydatid : Life cycle, reservoir, hosts, pathology, clinical features, complication, diagnosis, treatment.

(h) Pancreas : Acute and chronic pancreatitis : Aetioloy, pathology, clinical Features, diagnosis (US, X-ray/CT Scan, Biochemical tests), management and complications.

(i) Carcinoma : Common sites, aetiology, pathology, clinical features, diagnosis, management.

2. Desirable to know :

(a) Primary biliary cirrhosis : Definition, aetiology, clinical features, associations, diagnosis, investigation, treatment, complications, course and prognosis. Alcoholic liver disease : pathophysiology of alcohol related damage, pathologic types, clinical features, investigations, management, prevention.

Wilson's disease : Definition, copper metabolism, aetiology, pathology, clinical features, diagnosis, management. Prognosis.

Hemachromatosis : Brief introduction to aetiology, pathology, clinical features, diagnosis and treatment.

(b) Malignancy of the liver : Primary and secondary, aetiology, pathology, clinical features, diagnosis, treatment, prognosis.

(c) Drugs and the liver : Mechanism of drug hepatotoxicity : antitubercular drugs and hepatitis, Paracetamol, Halothane, Phenothiazines, Steroids.

(d) Gall stone disease : Types of gall stones, risk factors, aetiology, clinical presentation, diagnosis, complications, treatment.

(e) Carcinoma of Gall bladder : Aetiology, pathology, clinical features, management prognosis.

VII. Hematology

1. Must know :

1. Hematopoiesis : To have basic concepts about hematopoiesis, its regulation and life span of formed elements of blood.

2. Diagnostic methods : To be able to perform simple laboratory procedures like Hb%, TLC, DLC, peripheral blood smear etc., demonstration of bone marrow aspiration and biopsy.

3. Anemias : Classification based on etiology and morphology, clinical features, laboratory investigations & approach to anemia diagnosis.

4. Definition, prevalence, etiological factors, pathophysiology, pathology, clinical features.
investigation and principles of treatment of :

(a) Iron deficiency anemia

(b) Megaloblastic anemia

(c) Aplastic anemia

(d) Hemolytic anemia

(e) Bleeding disorders : Idiopathic thrombocytopenic purpura, drug induced thrombocytopenia

(f) Coagulation disorders : Hemophilia A & B, Vitamin K deficiency, Disseminated intravascular coagulation.

(g) Agranulocytosis

5. Leukemias : Definition, prevalence of the disease, clinical picture, pathology and laboratory diagnosis, and general principles of treatment.

6. Lymphomas : Definition, prevalence of the disease, Pathology, clinical picture and staging, general principles of treatment of Hodgkin's disease and non Hodgkin's lymphoma.

7. Plasma cell disorders : Etiology, pathogenesis, clinical features, diagnosis, staging treatment of multiple myeloma.

8. Blood group and : Major blood group systems and histo-compatibility
Transfusion complex, concepts of transfusion and component therapy; discuss indications for transfusion therapy; precautions to be taken during blood transfusion, hazards of transfusion and safe handling of blood and blood products.

9. Bone Marrow : Indications, types, complications and management.
Transplantation

VIII. Nephrology

1. Must know

(a) Introduction : Real function, structure, JGA, renin-angiotensin aldosterone system.

GFR : Normal and its measurement

Tubular function : Proximal and distal, Natriuretic hormone, erythropoietin, Vitamin D.

Tests for Renal disease : Urinalysis, oliguria, polyuria, specific gravity, blood, protein, glucose, microproteinuria, Urine spot sodium.

Microscopy : Casts, RBC, WBC.

Imaging Techniques : X-ray, urogram, USG, MCU, arteriogram, Scintigram, biopsy, (Brief introduction).

Biochemical : Urea, Creatinine, electrolytes, Calcium, phosphate and alkaline phosphatase.

(b) Glomerulonephritis : Definition, pathogenesis

(Immune complex, anti-GBM Antibody), aetiology, Pathology:

Macroscopic, microscopy□light, EM, IF

Main histopathologic types : Proliferative– DPGN,
FSGS, RPGN, MPGN;

Membranous, minimal change, IgA nephropathy,
Henoch-Schonlein Clinical features : investigations.

Acute Nephritis : Definition, aetiology, pathogenesis, clinical features, investigation, management–Life threatening complications, prognosis. Goodpasture's syndrome.

Nephrotic syndrome: Definition, aetiology, pathophysiology, clinical features, examination, investigation, management : Indications for biopsy, Steroids; Cyclophosphamide and other drugs; complications.

(c) Urinary Tract Infection/Pyelonephritis

Definition, pathogenic mechanisms, common organisms, predisposing factors, natural history (Isolated, recurrent : replace, reinfection), uncomplicated and complicated infection, symptoms and signs in superficial and deep UTI, urethral syndrome, diagnosis: Quantitative evaluation in different settings, special investigations : Excretory, Micturiting cystourogram, cystoscopy.

Treatment : Single attack, Recurrent infection, relapse or reinfection.
Urinary tract infection in special settings: Hospitalized patient, catheter, pregnancy, prostatitis, renal carbuncle, tuberculosis.

(d) Renal hypertension: Bilateral and unilateral renal artery disease, screening methods, diagnosis, treatment.

(e) Drug induced impairment of renal function: How to use safe prescribing in renal disease.

(f) Renal failure :

Acute – Definition, aetiology (Pre renal, renal, post renal), acute tubular necrosis, clinical features, investigations, complications of ARF, Differentiation of pre-renal and renal failure, role of renal biopsy, Management – General, Specific and complications.

Chronic – Definition, aetiology, clinical features.

Complications: Hematologic, bone, skin, GIT, neurologic, metabolic, endocrine, nuscle, cardiovascular.

Diagnosis.

Management : conservative; introduction to renal replacement therapy. (HD, PD, Complications), Introduction to Transplantation: Technique, Matching, Donor, use of immunosupressants.

Prevention of acute and chronic renal failure. How to differentiate acute and chronic renal failure. When to refer to a nephrology service?

(g) Renal calculus disease : Epidemiology, aetiology pathology, clinical features, complications, diagnosis, management. Prevention.

(h) Polycystic Kidney Disease : Family screening, clinical features, palpation of kidney mass, diagnosis and management. Associations.

(i) Renal cell carcinoma: Aetiology, pathology, clinical features, diagnosis, metastosis, treatment.

2. Desirabe to know:

(a) Tubulo interstitial nephritis: Definition, aetiology, analgesic nephropathy, clinical features, management, prevention.

IX. Neurology

1. Must know :

(a) - Basic Neuro-Anatomy & Physiology: Clinical methods.

- Diagnostic methods in Neurology : Common tests available in Neurology, their implications.

(b) - Disorders of Cranial Nerves (Applied Anatomy, various sites of lesions and their causes, clinical manifestations, diagnosis and management).

- Clinical demonstration of all Cranial nerve paralysis.

(c) - Spinal Cord: Common Spinal Cord Syndromes

Cervical spondylsis, Syrinogmyelia, Lumber Canal stenosis, Cauda Equina and conus

(Anatomy, clinical features, investigations and management)

- Spinal Cord Compression : Introduction, causes of spinal cord compression (Extradural and intradural)

(Intradural extra medullary and intra dural intra medullary) and their differentiation. Clinical features, investigations and management.

(d) Epilepsy : Definition, classification, aetiopathogenesis, clinical features, investigations and management . Management of status Epilepticus.

(e) Cerebral Vascular Accident (CVA) : Definition of Cerbral, vascular disease; the aetiopathogenesis, pathology of the disease; clinical manifestations; diagnosis; complications; basic investigations; treatment of the disorders.

(f) Peripheral Nerves : Introduction, Definition, classification, aetiopathogenesis, clinical features, diagnosis

(g) and investigations, management, complications and Prognosis.

Special emphasis on acute polyneuro-radiculopathy.

(h) Muscle diseases : Hereditary Muscular Dystrophy : Duchene Beckers Polymyositis : Introduction, clinical manifestations, diagnosis, investigations and treatment.

(i) Neuro muscular junction disorder : Myasthenia gravis - Etiopathogenesis, clinical features, diagnosis and management.

(j) Demylenating disorders : Multiple sclerosis : Introduction, aetiopathogenesis, clinical features, investigations, management, complications and prognosis.

(k) Movement disorders : Parkinsonism, chorea, athetosis, dystonia and tremors – Etiology, identification, clinical features and management.

(l) Spinal muscular atrophy : Introduction, types, clinical features & prognosis.

(m) Hereditary ataxias : Types, clinical features and diagnosis.

(n) Phakomas : Neurofibromatosis, Tuburous sclerosis, clinical features, diagnosis and management.

(o) Cerebral Tumours : Introduction, pathology, clinical features, investigations, management and prognosis.

(p) Degenerative disorders : Motar Neurone disease; introduction, clinical features, course of disease, investigations, management and prognosis.

(q) Nutritional disorders : Aetiopathogeneses, pathology, diagnosis, complications, investigations and treatment.

(r) Approach and management of raised intra cranial tension.

(s) Headache and migraine (classification, causes, clinical features and management).

X. Endocrinology

1. Must know :

(a) Diabetes mellitus : Classification, aetiology, clinical picture, diagnosis, complications and management.
Diagnosis of complications and management.

(b) Thyroid Disorders : (Hypothyroidism, hypertheyroidsism, thyroid, nodule and thyroditis)
Aetiology, clinical features, thyroid functions tests and other investigations, complications and management.

(c) Adrenal disorders : Types, aetiology, clinical features, complications and management.

(d) Pituitary disorders : Awareness of hypo and hyper functioning of

pituitary, various conditions causing above malfunctioning, their diagnosis and management.

(e) Principles of sexual : Approach and management to common sexual behaviour dysfunction. Their diagnosis and management.

XI. Rheumatology

1. Must know :

(a) Clinical history taking : Inflammatory vs non-inflammatory
Difference between arthralgia and arthritis
Patterns of Arthritis : Additive, migratory, monoarthritis, oligo and polyarthritis.

(b) Rheumatoid Arthrits : Definition, Epidemiology, aetiopathogenesis, Systemic lupus pathology, clinical features, extra articular erythmatosus manifestations, complications, diagnosis, Ankylosing spondylitis management, prognosis.

(c) Gout : Definition, epidemiology, aetiopathogenesis, clinical features, diagnosis, complications, management, prevention.

(d) Metabolic bone disease : Definition, aetiology predisposing factors, clinical, (Osteomalacia, biochemical, radiology, complication, management, Osteoporosis) prevention.
Hormone replacement therapy

(e) Osteoarthritis : Definition, aetiopathogenesis, pathology, clinical features, radiology, diagnosis, management. Preventive aspects.

2. Desirable to know :

(a) Juvenile chronic arthritis

(b) Systemic selerosis

(c) Polymyositis/Dermatomyositis

(d) Polyarteritis nodosa

(e) Reactive arthritis

3. Nice to know :

(a) Pagets disease

(b) Osteogenesis imperfecta

(c) Takayasu's Arteritis

XII. Fluid and Electrolytes

Body fluid compartment – distribution of water, osmolality.

Situations associated with increased ECF volume : Clinical features and causes, management.

Decrease in EC volume – Aetiology, clinical features, investigation and treatment.

Disorders of sodium concentration : Principles.

Hyponatremia : Aetiology in situations with decreased,
increased, normal Extra-cellular fluid volume Diagnosis and
treatment.
Syndrome of inappropriate ADH secretion
Hypernatremia : Common causes, clinical features, diagnosis and treatment.
Potassium : Its regulation in the body
Hypokalemia : Aetiology, clinical features, diagnosis and treatment.
Hyperkalemia: Aetiology, Clinical features, EKG changes and treatment.

Acid-base balance

Basic principles, buffers, respiratory and metabolic, acidosis and alkalosis, common causes of each group of disorders, anion gap and its measurement, situations with metabolic acidosis with increased anion gap.

Treatment of respiratory and metabolic disorders based on clinical situations.
Common ABG's to be discussed as examples : Diabetic ketoacidosis, ARDS, COAD, Diarrhoea, Renal failure, Vomiting.

XIII. Nutrition

1. Must know

(a) Introduction :

Interrelation of diet and disease : Developed and underdeveloped countries.
Energy, balance, basal metabolic rate, weight, BMI
Protein, fat, carbohydrates : Role in metabolism, energy, sources.
Protein energy malnutrition : Wellcome classification : Diagnosis, complications, Investigation, treatment, prognosis, prevention.
Vitamins : Fat and water soluble, role in the body, requirements, sources.
Treatment and prevention of deficiency and excess.
Special emphasis : Pellagara, Beri Beri, Scurvy.
Minerals : Definition of trace metals; iron, copper, zinc, iodine, fluoride, calcium, cobalt, cadmium.
Dietary fibre.

(b) Nutritional Support in the hospitalized patient

Principles, types of suport, diet formulation, total parenteral nutrition, Central venous catheter placement, monitoring a patient on TPN.

(c) Obesity

Definition, body mass index, aetiology, pathophysiology, clinical features and complications.

Treatment : Estimation of calories, distribution of carbohydrate, fat and protein, drug therapy, surgical treatment, morbidity and mortality. Diet prescription.

(d) Alcohol

Beverages, measures, metabolism, problems, in chronic alcoholics and binge drinkers, liver disease, physical effects of excess alcohol consumption, dependence, withdrawal, delirium, Methyl alcohol intoxication.
(Poisoning)

XIV. Poisoning

1. Must know :

(a) **Introduction :** General principles, Medicolegal aspects (in private setting and in Govt. Institutions), Induction of emesis, use of stomach tube and Ryle's tube, role of lavage, keeping samples.

(b) Identification of common poisons : Insecticides, Organophosphorus, Organochlorine, Carbamates, Weedicides, Aluminium phosphide, Corrosives, Sedatives, opioids, paracetamol.

(c) Drug addicts; typical clinical features, diagnosis, management.

(d) Therapeutic drug toxicity/overdosage : Digoxin, Theophylline, Antidepressants, Anticoagulants, Morphine, β-blockers, calcium channel blockers, Dilantin.

(e) Enviornmental exposure to Poisons :

(i) Stings/bites : Spider, Wasp, Bee, Scorpion, Snakes : Special emphasis on first aid and anaphylaxis, transport of victim, use of anti venom. Knowledge of common snakes and biting habits, Identification of snakes from specimens. Desensitization and role of Adrenaline in the setting of anaphylaxis.

(ii) Extremes of Temperature:
Heat stroke, exhaustion, cold exposure, electrocution, Radiation including hazards of Atomic explosion/mishap; Pathophysiology, Aetiology, Clinical features, diagnosis, treatment.

(iii) High altitude pulmonary oedema.

(iv) Risk of underwater diving.

XV. Dermatology

1. Must know

Note :

The important skin disorders should be discussed in the headings : Definition, Aetiopathogenesis, Pathology, Clinical presentation (Morphology, Distribution, Evolution, Exacerbation), Diagnosis, Treatment, Complications.

Desirable to have knowledge of skin biopsy, KOH preparation, Tzank smear, Disascopy, Wood's light, Patch test.

(a)	Introduction	:	Terminology of various skin lesions	
(b)	Erythematous-scalylesions	:		
		(i)	Dermatitis	Atopic
		(ii)	Eczema	Endogenous, Pompholyx Discoid Exogenous : Contact Exfoliative dermatitis
		(iii)	Psoriasis	
		(iv)	Scborrhoee dermatitis	
		(v)	Lichen Planus	
		(vi)	Pityriasis rosea	
(c)	Erythematous lesions	(i)	Urticaria	
		(ii)	Angioedema	
		(iii)	E. nodosum	
		(iv)	E. multiform	
(d)	Facial Dermatoses	(i)	Acne vulgaris	
		(ii)	Rosacea	

(e)	Bullous disease	(i)	Pemphigus vulgaris	
(f)	Skin infections	(i)	Bacterial	Pyoderma Impetigo Erysipelas Ecthema Furunculosis (boils) Carbuncles
		(ii)	Mycobacterial infection	Lupus vulgaris Tuberculosis Leprosy

A detail study of leprosy□Classification, Pathogenesis. Aetiologic agent, Indices (Bacteriologic and Morphologic), Clinical features, complications, Reactions and phenomenon, Lepromin test, Diagnosis, Treatment. Prevention, control, NLEP.

(iii)	Fungal infection	:	Dermatophytosis, Candidosis
(iv)	Viral infections	:	Varicella, H.Zoster, H.simplex, Warts
(v)	Infestations	:	Scabies, pediculosis
(vi)	Syphilis, gonorrhoea	:	Sexually transmitted diseases. Tropical Venereology
(vii)	Leishmaniasis.		

(g) Drug reactions

(h) Cutaneous presentation of systemic disease : SLE, DLE, Scleroderma, dermato myositis, Sarcoidosis

(i) Neurofibromatosis and Tuberous sclerosis.

(j) Vascular and lymphatic disorders : Ulcers : Arterial, venous, Pyodema gangrenosum (k) Naevi and Tumors
Haemangiomas, Basal cell carcinoma, Squamous cell carcinoma, Malignat melanoma

(l) Pigmentation disorders
Vitiligo, Albinism, Naevi, Hypermelanotic lesions

(m) Hair diseases : Hirsutism, Alopecia.

(n) Envirornmental hazards : UV light.

(o) Skin lesion of infancy : Napkin rash etc.

(p) Keratinization disorders : icthyosis.

2. Nice to know

(a) Mastocytosis, Bullous pemphigoid, Epidermolysis bullosa, Dermatitis herpetiformis.
(b) Erysipeloid, Erythrasma
(c) Atypical mycobacterial infection, Tuberculides
(d) Molluscum contagiosum, Orf
(e) Morphoea
(f) Skin Changes in diabetes, porphyria, amyloid
(g) Vasculitic lesions
(h) Mycosis fungoides, Kaposis sarcoma
(i) Lentigenes
(j) Skin manifestations of AIDS
(k) Bowen's disease

XVI. Psychiatry

1. Must know

(a) Introduction : Epidemiology, History taking : Clinical interview (aims) Mental state examination : Aspects to be examined. Define, elicit and interpret psychopathologic symptoms and signs.

Classification of Psychiatric disorders : Organic and functional mental health vs mental illness.

Aetiologic factors in psychiatry :

Genetic, family background, physical illness, stressful events, social network, predisposing, precipitating and maintaining factors

Concepts of normal and abnormal human behavior principles of learning, memory, personality, intelligence, psychopathology.

(b) Classification : : (i) Organic and Functional psychosis
(ii) Difference between Psychosis and Neurosis

(c) Organic Brain Syndromes : Generalized – delirium and dementia : Definition, classification.

Acute Confusional state–delirium Definition, aetiology, clinical features, management, dementia : definition, aetiology, treatable, clinical features, investigations, management.

Acute and chronic focal organic disorders Wernicke's encephalopathy, Korsakoffs psychosis, clinical presentation, diagnosis, treatment.

(d) Schizophrenia : : History, epidemiology, subtypes, aetiology (genetic, psychosocial, cerebral disease and neurotransmitter disturbance), clinical features. Detailed MSE, First rank symptoms, catatonia, thought disorder and other symptom, negative symptoms, course and prognosis, management (admission, drugs, social).

(e) Affective disorders : Definition : Primary (unipolar or bipolar,

depressive/manic), Secondary : epidemiology, aetiology

(genetics, environment-physical, personality)

Depression : Endogenous and reactive, Somatic symptoms, Indication for admission, Management (Antidepresants Cognitive, ETC). Clinical features of mania, management, course and prognosis of these disorders.

(f) Neurosis : Definition, classification, epidemiology, aetiology in

Anxiety, Phobias, panic, obsessive-compulsive disorders, hysteria (Conversion and dissociation), somatization disorder, hypochondriasis, hyperventilation.

Clinical features, diagnosis, management and prognosis. Differentiate hysterical conversion from organicity.

(g) Personality disorders : Anti social, paranoid, dependent, histrionic, Schizoid and obsessional : clinical diagnosis and management.

(h) Alcoholism : Terminology, epidemiology, aetiology,detection of heavy drinkers e.g. use of CAGE questionnaire.

Problems : Quantification of consumption, Social, Family, Psychologic, Physical problems.

Clinical and laboratory diagnosis of excess alcohol intake Dependence, course. Withdrawal symptoms Treatment : Psychologic, drugs, outcome.

(i) Drug abuse and dependence : List of common drugs : Aetiology, clinical features, diagnosis and management of sedative, hypnotic, anxiolytic dependence. Clinical features, diagnosis and management of opioid, cannabis, CNS stimulants, cocaine, hallucinogens, organic solvents, dependence and its diagnosis.

(j) Psychosomatic disorders : Psychologic reaction to physical illness; organic causes of affective disorders, clinical features, diagnosis and treatment Puerperal mental disorder : Post natal blues, depression, puerperal psychosis.

(k) Suicide : Epidemiology, Aetiology, Common methods, assessment of patients after attempted suicide, risk factors for suicide after a suicide attempts.

(l) Psychiatric emergencies : Clinical recognition and initial management.

(m) Child psychiatry : Common disorders, mental retardation, aetiology, clinical diagnosis and treatment : Pharmacology and behaviour therapy.

(n) Biological therapy : Biologic basis of psychiatric disorders
Psychopharmacology
Pharmacology of common anxiolytics, antidepressants, antipsychotics, lithium.
Psychotherapy : Different types, principles and use
Principles and application of behavior therapy
Mechanisms and indications for Electroconvulsive therapy.

Note : The *Core* content may vary for different parts of India.

The topics mentioned in prescribed textbooks but not covered in *Core* list may be considered as 'desirable' area for learning.

SURGERY (including orthopaedics)

Departmental Objectives:

At the end of the training the student will:

1. Be able to evaluate and diagnose each patient as a person and not a collection of organ system.

2. Have developed an interest in and be able to manage all types of patients.

3. Be able to guide the patient through illness and handle the emotions, hopes and fears in the patient, attendants and in himself.

4. Be able to requisition and interpret basic relevant investigations independently.

5. Provide adequate pre, intra, post-operative and follow-up care of the surgical patient.

6. Possess adequate knowledge in the science of surgery and be able to

   (i) Elicit a good clinical history.

   (ii) Perform a thorough methodical clinical examination.

   (iii) Elucidate the clinical problem with particular emphasis on the dominant one.

   (iv) Discuss the laboratory tests/investigations that may be helpful.

   (v) On the steps in the management of the surgical disease.

   (vi) Responsibility pursue new knowledge that can be used in the good of the patient.

   (vii) Base the diagnosis and management on knowledge gained in basic paraclinical and clinical subjects.

   (viii) Provide competent emergency resuscitative measures in acute surgical situations including trauma.

   (ix) Be able to identify situations calling for urgent/early surgical interventions and refer to the secondary/territory centres at the optimum time.

7. Have an understanding of the art of surgery involving

   (i) Effective communication with the patient

   (ii) Empathy

   (iii) Understanding the socio-economic status of the patient in relation to management.

   (iv) Understanding patient and family ethical responsibility.

8. Learn to be adaptable

(i) To new ideas.

(ii) To new situations with cost and resource restraints (audit).

9. Perform simple routine surgical procedures.

10. Organize and conduct relief measures in situations of mass casualties.

11. Understand medico-legal and ethical implications of surgical decisions in the context of Consumer Protection Act.

12. Clinical skills:

(i) **Clinical and procedural skills :**

- Ability to take a relevant and detailed history.
- Ability to conduct a thorough and humane clinical examination.
- Ability to come to a provisional working diagnosis.
- Ability to perform or order relevant investigations keeping the cost-effectiveness in view.
- Ability to interpret common laboratory and radiological investigations.
- Calculation of fluid/electrolyte requirements.
- Diagnosis of acute abdomen and referral after first aid.
- Referral of chest injuries after diagnosis and first aid/I.C. Tube/needle for pneuthorax.
- Proper splinting and transfer of patient with fractures.
- Care and transport of unconscious and paraplegic/quadriplegic patients.
- Precautions to be observed in patients with Hepatitis B and AIDS.
- Awareness of scope and risks of blood transfusion.
- Aseptic techniques.
- Principles of Sterilization.

(ii) **Diagnostic and therapeutic decision making skills at the primary case level.**

(iii) **Communication skills**

- Ability to establish rapport with patients.
- Ability to appreciate right to privacy while eliciting history. Ability to inform nature of illness to patients and relatives .Asking permission before examination.

- Obtaining informed consent.
- Ability to discuss with patients and relatives need for and consequences of therapy.
- Motivation for blood donation/organ donation/family planning/postmortem examination etc.
- Organize and give training regarding first aid to paramedical and lay public.
- Be aware of concessions and other social welfare measure available for patients and advise accordingly
- Be aware of the principles of management of mass causalities.
- Health education regarding preventive aspects.
- Proper file maintenance and documentation of relevant details.

(iv) Managerial skills

Leadership

- Time management
- Team building
- Maintaining stock and inventory relevant to managing primary health centre. Doctors role in disasters in India

(v) Manipulative Skills

- Starting I.V. line
- Venesection
- Passing N.G. tube
- Stomach wash
- Enema
- Vasectomy
- Circumcision, reduction of paraphimosis
- Proctoscopy
- Conservative treatment of fissure in ano
- Injection-sclerotherapy of piles
- Banding of piles
- Incision and drainage of abscesses including hand infections
- Field block/digital block
- Suturing of wounds
- Control of surface hemorrhage
- Excision of lipoma and sebaceous cyst
- Paracentesis abdominis

- Care, cleaning and dressing of wounds (including tetanus and gas gangrene prophylaxis)
- First aid
- Application and removal of p.o.p. casts
- Application of skin and skeletal traction
- Catheterisation

(vi) Laboratory skills

- Urine for albumin, sugar, ketones, Urobilinogen, M/E
- Blood for Hb, TLC, DLC ESR, peripheral smear
- Stool for ova, EH, occult blood
- Gram's stain
- Ziehl Nielson's stain

13. Attitude and value concern skills

(i) Ethical behaviour

(ii) Keep patients welfare foremost to provide quality healthcare as well as to avoid consumer initiated legal problems.

(iii) Develop Holistic view of surgery taking socio-cultural factors in each case.

(iv) Possess positive attitude to pursue self-directed learning and keeping abreast with recent advances.

SURGERY

Course Contents

1. WOUND HEALING

Must Know Healing by first intention; healing by second intention; the biological process of

healing, factors influencing wound healing; scars□Hypertrophic scars, keloid, incisions, types of wound and their closure.

2. RESUSCITATION AND SUPPORT

Must Know Fluid electrolyte balance : Surface hemorrhage and control; shock; blood; transfusion pre and postoperative management.

Desirable to Know Nutrition in injured patient; acute and chronic pain relief.

3. INFECTIONS

Must Know Types of wound infection; prevention of infection; antibiotic prophylaxis; tetanus gas gangrene; mycobacterial diseases of surgical importance; AIDS-Surgical aspect.

4. TUMOURS, CYSTS, ULCERS, SINUSES

Must Know General Principles of tumours, benign tumours, malignant tumours□carcinoma, sarcoma; cysts.

5. SKIN AND SOFT TISSUES

Must Know Skin infections, sebaceous cyst, skin tumours□BBC, SCC, Melanoma,
Dermatofibrosar-coma; premalignant conditions of skin,
Skin grafting□skin, grafts, types and techniques, skin flaps.
Pressure-Principles of Management and Surgical Alternatives.

6. ARTERIAL DISORDERS

Must Know Acute arterial obstruction-diagnosis and initial management; types of gangrene; diagnosis of chronic arterial insufficiency.

Desirable to Know Investigation in case of arterial obstruction, Amputations

7. VENOUS DISORDERS

Must Know Varicose veins, diagnosis and management; deep venous thrombosis - diagnosis, prevention, principles of therapy.

8. LYMPHATICS AND LYMPHNODES

Must Know Lymphangitis; lymphedema aetiology; surgical manifestations of filariasis; acute lymphadenitis; chronic lymphadenitis, lymphomas.

Desirable to Know Lymphedema management

9. BURNS

Must Know Pathophysiology; assessment of depth and surface area, resuscitation; skin cover, prevention of contractions.
Therapy of burns including treatment of complications.

10. SCALP, SKULL AND BRAIN

Must Know Wounds of scalp and management recognition, diagnosis and monitoring of patients with head injury including unconsciousness of acute cerebral compression.

11. DEVELOPMENTAL, ABNORMALITIES OF FACE, PALATE, LIPS, MAXILLOFACIAL INJURIES

Must Know Cleft Lip & Palate Cancer Lip

Desirabe to Know Embryology of facial defects and principles of management.

12. THE MOUTH, THE CHEEK, THE TONGUE

Must know Salivary retention cyst, tumours of the oral cavity, cheek and tongue including prevention, staging, principles of therapy, ulcers of tongue.

13. TEETH AND GUMS, JAWS, NOSE, EAR

Desirable to Know Epulis-cysts and tumours of the jaw.

14. SALIVARY GLANDS

Must Know Acute partotitis, neoplasms□disgnosis and principles of management. Submandibular gland.

15. NECK

Must Know Branchial cyst; cystc hygroma, cervical lymphadenitis; secondaries neck; tuberculosis of lymphodes.

Desirable to Know Thoracic outlet syndrome□diagnosis.

16. THYROID GLAND

Must Know Thyroid□surgical anatomy, physiology□types of goitre; diagnosis of goitre and principles of management; thyrotoxicosis□types, symptomatology; differential diagnosis, thyroglossal cyst; Neoplasm; Classification, diagnosis, principles of treatment.

Desirable to Know Thyroiditis

17. PARATHYROID AND ADRENAL GLANDS

Must Know Diagnosis of hyperparathyroidism; diagnosis of adrenal hyperfunction/hypofunction.

18. BREAST

Must Know Surgical anatomy, nipple discharge, acute infections, mammary dysplasia, fibroadenoma: cancer breast—diagnosis, staging, principles of management.

19. THORAX

Must Know Recognition and treatment of pneumothorax**,** haemothorax, pulmonary embolismprevention/recognition and treatment.

Desirable to Know Flail chest: stove in chest: principles of management of pyothorax; cancer lung, postoperative pulmonary complications.

20. HEART AND PERICARDIUM

Desirable to Know Scope of cardiac surgery

21. OESOPHAGUS

Must Know Causes of dysphagia investigations and approach to acute/chronic abdominal pain.

22. STOMACH AND DUODENUM

Must Know	Anatomy, Physiology, congenital hypertrophic pyloric stenosis and management; peptic ulcer, actiopathology, clinical features, diagnosis management, cancer stomach, diagnosis and principles of treatment; upper gastrointestinal hemorrhage.
Desirable to Know	UGI endoscopy.

23. LIVER

Must Know	Amebic liver abscess diagnosis and management; hydatid cyst diagnosis; diagnosis of portal hypertension; principles of emergency management of portal hypertension; obstructive jaundice.
Desirable to Know	Surgical anatomy and physiology: Management of hydatid cyst; neoplasms of liver. Liver Transplant Introduction.

24. SPLEEN

Must Know	Surgical causes of splenomegaly: investigations for splenomegaly; splenic injury.
Desirable to Know	Principles of splenectomy for haematological causes.

25. GALL BLADDER AND BILE DUCTS

Must Know Cholelithiasis□Clinical features, diagnosis; cholecystitis□clinical features, diagnosis, Anatomy, Physiology, Investigations.

Desirable to Know Management of Cholelitiasis and cholecystitis, Neoplasm of biliary tract Laparoscopic cholecystectomy

26. PANCREAS

Must Know Acute and chronic pancreatitis□diagnosis and complications.

Desirable to Know Acute and chronic pancreatitis□management and investigations: Pancreatic Neoplasms.

27. PERITONEUM, OMENTUM, MESENTERY AND RETROPERITONEAL SPACE

Must Know Peritonitis - Recognition and principles of management.

Desirable to Know Surgery for peritonitis

Diagnostic Laparoscopy.

28. SMALL AND LARGE INTESTINES

Must Know Intestinal amoebiasis, tuberculosis of intestine, carcinoma colon - diagnosis and principles of treatment; lower gastrointestinal hemorrhage.

Desirable to Know Ulcerative Colitis, Crohn's diseases.

29. INTESTINAL OBSTRUCTION

Must Know Diagnosis, classification, features and principles of management, paralytic ileus and mechanical intestinal obstruction; T.B. intestine and peritoneum.

30. APPENDIX

Must Know Diagnosis, management of acute appendicitis including appendicular lump.

31. RECTUM

Must Know Carcinoma of rectum, diagnosis and clinical features.

Desirable to Know Surgical anatomy; management of carcinoma rectum; prolapse of rectum. Procto Sigmoidoscopy.

32. ANAL CANAL

Must Know Examination of anal canal; fissure; ristula in ano, abscess and haemorrhoid Clinical features and management; surgical anatomy.

Desirable to Know Congenital anomaly - imperforate anus.

33. HERNIAS

Must Know Inguinal hernia - diagnosis, complications, principles of management; Umbilical hernia - diagnosis; Femoral hernia - diagnosis, management.

Desirable to Know Umbilical Hernia - management, epigastric hernia; omphalitis; fistulae - burst abdomen and ventral hernia.

34. URINARY SYSTEM

Desirable to Know Investigations of the urinary tract.

35. KIDNEY AND URETER

Must Know Recognition of renal mass.

Desirable to Know Renal calculus; ureteric calculus; hydronephrosis, pyonephrosis and perinephrio abscess; renal tuberculosis; diagnosis and management of renal tumours.

Renal Transplant - Introduction.

36. URINARY BLADDER

Must Know Acute retention of urine□diagnosis and principles of management; causes of haematuria.

Desirable to Know Investigation and management of haematuria

Diagnostic cystoscopy

37. PROSTATE AND SEMINAL VESICLES

Must Know BPH Diagnosis

Desirable to Know BPH management including Transurethral resecstion of prostate.

38. URETHRA AND PENIS

Must Know Phimosis, paraphimosis; carcinoma penis - diagnosis; stricture urethra.

Desirable to Know Hypospadias

39. TESTES AND SCROTUM

Must Know Embryology of testicular descent; diagnosis and principle of treatment of testicular maldescent; torsion testis; epididymo orchitis; diagnosis of testicular lump; hydrocele.

Desirable to Know Varicocete; neoplasms of tests

40. TRAUMA

Must Know First Aid management of severely injured patient
Head injury & Glasgow coma scale
Tendon & Nerve injuries - Diagnosis & Management and techniques of repair. Diagnosis and Management of Hand injuries with special reference to finger tip injury.

Desirable to Know Missile injuries - Mechanism and Management, gunshot wounds, blast injuries mechanism and management.

41. MISCELLANEOUS

Desirable to Know Varieties of suture materials available and their clinical application

Microsurgery : Introduction and its role

Introduction to Aesthetic Surgery.

Suggested Books :

1. Short Practice of Surgery : Vailey & Love
    Text Book of Surgery : Sabiston I & II

- Mastery of Surgery : Lyoid M I & II
- Oxford Text Book of Surgery : Nyhus I & II
- Principles of Surgery : Schwartz I & II
- Clinical Surgery : A.Cushieri
- Laparoscopic Surgery : A.Cushieri

2. **CLINICAL METHODS :**

- Clinical method in surgery : S. Das
- Clinical method in surgery : Hamilton Baieley
- Clinical method in surgery : Norman Browsen

:

ORTHOPAEDICS

1. FRACTURES

Must Know Definition, classification, Principles of diagnosis and treatment, complications, special features of fractures in children.

2. JOINT INJURIES

Must Know Salient features of normal joint anatomy, Pathology of dislocation and subluxation, strain of ligaments.

3. HEALING OF FRACTURES

Must Know Mechanism and types of healing, Causes of delayed union and non-union and principles of their management.

4. MANAGEMENT OF THE CRITICALLY INJURED (POLYTRAUMA) PATIENT

5. SPINE

Must Know	Types of spine injuries and their presentation, diagnosis and care in the emergency area, care of paraplegic and quadriplegic.
Desirable to Know	Pathoanatomy and methods of definitive treatment.

6. SHOULDER

Must Know	Classification of injuries around the shoulder girdle, diagnosis and management of simple fractures like fracture clavicle, greater, lesser tuberosity and surgical neck of humorous, diagnosis and management of dislocation shoulder, acromio□clavicular dislocation, fracture scapula.
Desirable to Know	Indications of surgery for various fractures around shoulder girdle, treatment of recurrent dislocation of shoulder, rotator cuff injuries.

7. ARM

Must Know	Mode of injury, diagnosis, complications and methods of treatment of fracture humerus.

8. ELBOW

Must Know	Classification of various injuries around elbow, Principles of management of various injuries like supracondylar fracture, fracture lateral condyle humerus, medial epicondyle, dislocation elbow, fracture olecranon, fracture neck & head of radius.
Desirable to Know	Indications and methods of operative treatment of above fractures.

9. FOREARM

Must Know	Classifications of various injuries of forearm, Principles management of Montegia fracture dislocation, fracture radius and ulna, Galezzi, fracture, Colles fracture.
Desirable to Know	Indications and methods of operative treatment of above fractures, treatment of complications of above fractures.

10. WRIST & HAND

Must Know Classification & Principles of management of distal radial fractures, Scaphoid fracture.

Desirable to Know Treatment of non-union of fracture Scaphoid and method of operative treatment of above fractures, treatment of complications of above fractures.

Principles of management of short tubular bones of hand.

11. PELVIS, HIP & THIGH

Must Know Classification & Principles of management & complications of fracture, pelvis & dislocations of hip, fracture neck femur, trochantric fractures, fracture shaft of femur and supracondylar fracture.

Desirable to Know Internal derangement of knee.

12. INJURIES AROUND KNEE

Must Know Classification & Principles of management & complications of fracture patella, fractures of the tibial condyle.

Desirable to Know Internal derangement of knee.

13. LEG

Must Know Classification & Principles of management & complications of fractures of tibia & fibula including compound fractures.

Desirable to Know Operative treatment of above fractures.

14. FOOT & ANKLE

Must Know Classification & Principles of management & complications of fractures of ankle, talus & calcaneum.

Desirable to Know Operative treatment of above fractures. Principles of management of fractures of short tubular bones of foot, Lisfrane's injury.

15. NERVE INJURIES

Must Know Classification & Principles of management of nerve injuries, including brachial plexus, radial, median & ulnar nerve.

Desirable to Know Principles of management of Sciatic nerve injury.

16. AMPUTATIONS

Must Know Indications & Principles of amputations, below knee, above knee, below elbow & above elbow amputations, syme's amputations.

17. METABOLIC BONE DISEASE

Must Know Aetiopathogenisis & principles of management of rickets, osteomalacia & osteoporosis.

18. INFECTIONS

Must Know Aaetiopathogenesis & principles of management of pyogenic and tubercular infections of bone & joints tuberculosis of hip, spine, knee.

Desirable to Know Tuberculosis of wrist and ankle.

19. CONGENITAL ANOMALIES AND DEVELOPMENTAL DISORDERS

Must Know Aetiopathogenesis & principles of management of clubfoot and congenital dislocation of hip.

Desirable to Know Operative treatment of above, Briefly about osteogenesis imperfecta, osteopetrosis.

20. TUMOURS

Must Know Classification of benign and malignant tumours, Principles of management of osteochondroma, Ewing's tumour, Giant Cell tumour and Osteogenic sarcoma.

Desirable to Know Presentation and principles of management of multiple myeloma and metatasis.

TEACHING AND TRAINING IN SURGERY AND METHODS OF ASSESSMENT

A. TEACHING AND TRAINING :

The teaching shall be imparted to the students from the 3rd semester (2nd year) onwards and would comprise of theory and practical components as per the MCI guidelines.

1. THEORY

The theory component (as detailed in the previous pages of the syllabus) shall be covered in the form of didactic lectures which shall not be less than 300 hours i.e. 400 lectures of 45 minutes each. The lectures would be distributed throughout 3rd to 9th semesters.

2. PRACTICAL

The practical component would comprise of bedside clinics, case demonstrations in the wards and emergency, postings in operations theatre and the out-patient department and seminars. Seminars would be conducted in the last two semesters.

There would be an introductory course in clinical methods of two weeks for the whole class in the beginning of the 3rd semester which would be followed by clinical posting in the 3rd, 5th , 7th , 8th , and 9th semesters of minimum 3 hours duration daily, totalling 26 weeks, as per the following schedule :

TABLE-1 CLINICAL POSTING IN SURGERY

3rd Semester (Weeks)	5rd Semester (Weeks)	7rd Semester (Weeks)	8rd Semester (Weeks)	9rd Semester (Weeks)	Total (Weeks)
6	4	4	6	6	26

B. ASSESSMENT :

The performance in the subject in essential components of training would be assessed on the basis of attendance, internal assessment and university examination.

(A) Attendance :

75 % of attendance in the subject is compulsory for appearing in the examination provided each candidate has a minimum 80 % attendance in non - lecture teaching i.e. bedside clinics, case demonstrations, seminars and clinical posting in the ward.

(b) Internal Assessment :

The assessment would be regularly carried out for theory and practical components separately as follows :

(i) Theory: Class tests would be taken quarterly, covering the topics/system is completed.

(ii) Practical: A ward leaving examination would be held after the conclusion of each clinical posting and will be based on evaluation practical skills in clinical history taking an examination.

(iii) Day to Day Assessment: This shall be based on the students' daily performance in the area of their posting by their teachers and would be graded from A to D (A- Excellent, B-Good, C-Fair, D-poor).

(iv) Sent up Examination: This would be held before the final university examination in the same pattern as the final examination and will include theory and practical assessment.

(v) Internal Assessment: The weightage for the internal assessment shall be 20 % of the total marks in the subject.

(vi) Minimum Marks: A student must secure atleast 50% marks of the total marks fixed for internal assessment, in order to be eligible to appear in the final university examination.

Suggested Books :

(i) Apley's Orthopaedics

(ii) A Manual of Clinical Surgery : S. Das

(iii) Maheshwari's Text Book of Orthopeadics.

(iv) Outline of Fractures. : John Crawford Adam

(v) Outline of Orthopaedics. : John Crawford Adam

OBSTETRICS & GYNAECOLOGY

Departmental Objective :

The broad goal of teaching undergraduates in Obstetrics & Gynaecology will be that he/she shall acquire understanding of the anatomy, physiology and patho physiology of the reproductive system and gain the ability to optimally manage common conditions affection it. Special emphasis would be placed on the social aspects of the obstetrics practice. MCH care, family planning and contraception. The objective will be to prepare the student to actively participate and contribute to the Nation's Health Programs.

The teaching will be student centered rather than teacher centered, problems based rather than information gathering, community based, systematic and integrated. It will help the student to develop clinical skills to diagnosis & manage health problems and acquire self-learning attitude, to assist him to develop personal characteristics and attitudes necessary for the professional life.

The clinical posting will encourage the students to have a wide exposure and actively participate in patient management under supervision of the faculty and other resident doctors.

During clinical posting in the department of Obstetrics & Gynaecology, the student will spend an allotted time with each consultant. The students will follow the duty timetable of the Unit to which he is attached. He will be an active assistant to the Resident doctors and should feel part of the consultant's team of doctors. He will take part in clerking working up and management of patient under supervision and guidance. He will be with the consultant at the Gynae and Antenatal Clinics and in the Operation Theatre. He will accompany the Consultant on rounds in the Antenatal, Postnatal, Gynae and Labour Wards. He should be prepared to present and discuss his cases on Consultant ward rounds.

At the end of the training, the student will be able to :

(i) Elicit a good clinical history.

(ii) Perform a thorough and methodical clinical examination.

(iii) Elucidate the clinical problem with particular emphasis on the dominant one.

(iv) Analyse and synthesize the information to form a differential diagnosis and hypothesize a Ayndrome.

(v) Discuss the laboratory tests/investigations that may be helpful to (iv) above.

(vi) Outline the steps in the management of various diseases.

(vii) Base the diagnosis and management on knowledge gained in basic, paraclinical and clinical medicine.

(viii) Responsibly pursue new knowledge that can be used for the good of the patient.

(ix) Provide competent medical care initially in all Obstt. & Gynae patients.

(x) Learn the effective communication skills with the patient.

(xi) Have an attitude of empathy and understanding.

(xii) Will learn to be adaptable to new ideas.

(xiii) Will understand ethical and legal aspects of the medical decision making.

(xiv) Will be able to function as member of health care team.

The Students Will Have Learnt The Skills To:

1. Examine a pregnant woman; recognize high risk pregnancies and make appropriate referrals.

2. Conduct a normal delivery, recognize complications and provide postnatal care.

3. Resuscitate the newborn and recognize congenital anomalies.

4. Advise a couple on the use of various available contraceptive methods and assist in insertion and removal intra-uterine contraceptive devices.

5. Perform pelvic examination, diagnose and manage common gynaecological problem including early detection of genital malignancies.

6. Make vaginal cytological smear, perform a post coital test and wet vaginal smear examination for trichomonas vaginalis, moniliasis and Grain's for gonorrhea.

7. Interpretation of date of investigations like biochemical, histopathological, radiological ultrasound etc.

8. The students shall be able to integrate clinical skills with other disciplines and bring about coordination of family welfare programs for the national goal of population control.

In the following areas of practical and theoretical of Obstetrics and Gynaecology, it is required that the students :-

1. Antenatal Clinics

I. Must Know

(a) History taking
(b) General examination and Obstetrical Examination
(c) To establish the period of the gestation
(d) To order routine investigation
(e) To give routine advise and medication
(f) To detect high risk factors
(g) To foresee the complication and to prevent them
(h) To teach the mother elements of child care, nutrition, personal hygiene and environmental sanitation.
(i) Problems of multiparty, induced abortion and MTP.
(j) To assist the mother and family in future family planning.

2. Desirable to Know

(A) To remove anxiety and dread associated with delivery.
(B) To work towards achieving the goal of reducing maternal and infant mortality and morbidity.
(C) To educate the family about the value of girl child and work towards removing gender bias.
(D) To know about the problem of population growth in India i.e. fertility rates, birth rates, death rates, maternal and perinatal mortality rates in India.

II Labour Wards and Emergency Obstetrics

1. Must Know

A. Admissions and Preparation of patient in labour.

B. First State Management

1. Admision and preparation of the patient in labour.
2. History taking.
3. Reading of antenatal records, noting and making use of relevant information in the records.
4. Making routine observations and recording these observations.

- Maternal Pulse B.P. Temperature.
- Fungal Height, Lie, Presentation, Position and Station.
- Character of uterine contraction: strength, duration and frequency.
- Descent of the presenting part and recording it in 5^{th} (Chricton).
- Listening of Fetal Hearth Sound and recording the rate.
- Watching the vulva for liquor and for presence of Meconium.
- Watching the vulva for bleeding PV.
- Vaginal examination under supervision to determine Presentation, Position, Effacement, Dilatation and Consistency of the Cervix, presence of Cord or Cord Prolapse; if the Membranes are reputed or not; character of the liquor if the membranes are ruptured.

- Assessment of progress of labours using the Partograph.
- Testing urine for Sugar, Ketone bodies proteins.
- Setting up IV drips when indicated.
- Taking blood for Hb, Blood Group, Cross Match and other investigations when indicated.

C. 2^{nd} Stage Management

- The students will first observe and then assist at normal vaginal deliveries, and then perform or assist at least 20 deliveries (10 normal + 5 abnormal + Cesarian) under supervision. The particular of these should be recorded. The supervising doctor should certify the record by signing it.

- He/She will assist at 5 instrumental vaginal deliveries and at least 5 cesarean section.

D. Episitomy and its Repair

- The students will know when and episiotomy is indicated, how it is done how it is repaired.
- He will learn the techniques through observation and through practice under supervision until he is proficient .

- He will know how to repair first and 2nd degree perineal tears.
- He will know the after-care of these operations and their complications.

E. Routine Observations During the 3rd Stage and Delivery of Placenta.

- Management of Primary Post Partum Haemorrhage :

- Precautions that are taken to prevent or reduce the likelihood of PPPH in a patient with a risk factor for PPH management of the established case.

F. Routine Observation and Care of Baby at Birth:

- Care of oropharynx, nasopharynx and eyes once head is born.
- APGAR Score.
- Resuscitation.
- General examination and preliminary examination for the fetal abnormalities.
- Weighing.
- Warmth.
- Indication for transfer to Special Care Nursery.

G. Routine Observation in 4th Stage and Transfer to Postnatal Ward.

Observation must be recorded before patient is transferred to lying in ward.

In the labour ward the student must conduct himself well and should carryout routine procedures as directed by the doctor on duty.Vaginal examinations should be done only under supervision of the doctor.

1 Desirable to know

a. Interpretation of electronics fetal heart monitoring during labour .
b. Monitoring of Oxytocine drip and learning about normal and abnormal uterine action.

c. Learn the basics of new born resuscitation of the newborn.

III. Post Natal Wards.

1. Must Know
2. Maternal Observations

(i) Pulse, B.P. and Temperature.

(ii) Bladder and bowel function.

(iii) Measurement for Uterine involution.

(iv) Character of Lochia Quantity, colour, smell.

(v) Breast examination and breast-feeding.

(vi) HB concentration.

Baby Observation.

1. Examination for congenital abnormalities
2. Bowel and bladder function
3. Sucking ability
4. Weight charting
5. Examination of eyes, mouth and umbilical cord stump for signs of infection
6. Look for jaundice
7. Look for skin rashes.
8. Temperature and respiration.
9. He will advise mother on breast-feeding and care of breast, episiotomy or perineal tear of cesarean wound and care of umbilical cord stump.

- He will know the causes of puerperal pyrexia and will learn the necessary physical examination and all the indicated investigations incase of puerperal pyrexia.

- Before the mother is discharged home he will educate, inform and counsel her on :

(i) Baby care

(ii) Breast feeding

(iii) Immunization of baby.

(iv) Family planning

(v) Personal hygiene, diet and exercises (vi) Post natal visits.

IV. Antenatal and Gynae Wards

1. Must Know

- To work up emergency and cold cases as they are admitted
- To undertake pre-operative preparation of cases.
- To take part in the post operative care of patients.
- To observe and monitor daily progress of the patients.
- He will read up on his cases and discuss them on ward round.
- Will take part in the diagnosis and management planning of his/ her patients
- Will follow up his patients till discharge.

V. Theoretical Course in Obstetrics

1. Must know

2. Physiology of ovulation, conception.

3. Placenta, Cord, Membranes.

4. Fetus-size circulation, nutrition.

5. Anatomy of normal female pelvis, Fetal skull.

6. Maternal physiology and adaptation to pregnancy.

7. Normal pregnancy diagnosis.

8. Antenatal care.

9. Obstetric history taking and obstetrical examination.

10. Prenatal counselling and diagnosis.

11. Pathology of pregnancy.
12. Pelvic organs.
13. Placenta abnormalities.
14. Gestational Trophohlastic disease.
15. Antepartum haemorrhage.
16. Polydrammios /oligohydramnios.
17. Hypertensive disorders of pregnancy.
18. Medical Surgical , Psychiatric disorders during pregnancy.
19. Placental insufficiency, IUGR, postmaturity, intrauterine fetal death.
20. Multiple pregnancy.
21. Bleeding in early pregnancy.
22. Ectopic pregnancy.
23. Normal Labour, Physiology, Mechanism, Stages, Management , Obstetrics analgesic.
24. Abnormal labour, Fetal malpresentation & malposition
25. Pelvic abnormalities & Deistic.
26. Pretern labour & Premature rupture of membranes
27. Antepartum & intrapartum rupture of membranes
28. Maternal trauma including rupture uterus.
29. Post partum haemorrhage.
30. Normal and abnormal puerperium.

31. Obstetric operation and procedures.

32. Temporary and permanent contraception methods, side effects/treatment of side effects.

33. Ultrasound in Obstetrics.

34. MTP law, clauses & induction of abortion.

2. Desirable to know.

- Counselling in obstetrics.
- Problems of the new born.
- Medical legal obstetric problems.
- Lectures on vital statistics.
- Population growth rate, Total fertility rate-India/Global.
- Data of Maternal, perinatal & infant mortality and their major causes.
- National Health program in relation to Obstetrics & Gynaecology.
-

VI. Theoretical Course in Gynaecology.

1. Must Know.

- Anatomy & physiology of female reproductive organs.
- Menstrual physiology
- Gynaecological history taking and examination.
- Congenital anomalies of the genital tract.
- Diseases of vulva vagina.
- Pelvic infection and infection of lower genital tract Disorder of menstruation.
- Infertility.
- Endometriosis, adenomyosis.
- Genital prolapse.
- Disorder of the urinary system.
- Benign tumour of Cx, uterus, overies, vulva, vagina fallopian tubes.
- Gynaecological routine minor operation and procedure Routine Gynaecological major operations.

- Contraception temporary and permanent methods, side effects with their management.

2. Desirable to Know

- Paediatric & adolescent Gynaecological Problems.
- Radiotherapy & chemotherapy of Gynaecological cancer
- Use of hormones in Obstetrics & Gynaecological
- Natural & Surgical menopause and problems related with menopause.

Suggested Books

1. Obstetrics by Ten Teachers edited : Stanley Clayton/ Stuart Campbell.
2. Gynaecological by Ten Teachers edited : Stanley Clayton/ Stuart Campbell
3. Shaw's Text Book of Gynaecological 4. Holland and Brews: Manual of Obstetrics.
5. Mudaliar and Menon/Clinical Obstetrics.

PAEDIATRICS

Departmental Objectives :

The objectives of training the undergraduate students in Paediatrics is to ensure that at the end of the training he/she will be able to:

Diagnose and appropriately treat common pediatric and neonatal illness.

Identify pediatric and neonatal illness and problems that require secondary and tertiary care and refer them appropriately.

Advise and interpret relevant investigations.

Counsel and guide patient's parents and relatives regarding the illness, the appropriates care, the possible complications and the prognosis.

Provide emergency cardio pulmonary resuscitation to newborns and children.

Participate in the National Programmes effectively.

Diagnose and effectively treat common acute pediatric and neonatal emergencies.

Discharge medico –legal and ethical responsibilities.

Perform routine investigation and therapeutic procedures.

Motivate parents to consent for a diagnostic autopsy.

1. VITAL STATISTICS

Must Know :

- Definition and overview of Paediatrics with special reference to age –related disorders. Population structure. Pattern of morbidity and mortality in children.
- Maternal, Perinatal, neonatal and infant mortality rates. Definition, causes, present status and measures for attainment of goals.
- National Programmes pertaining to Child Health (RCH). Goals and salient features of ICDS Programme and National Child Survival and safe motherhood Programme, vitamin A prophylaxis programme, Prophylaxis against nutritional anemia.

Desirable to Know

- Control of iodine deficiency disorder, special nutrition programme, Balwadi nutrition programme, Midday meal programme.

2. GROWTH AND DEVELOPMENT

Must Know :

- Normal growth from conception to maturity. Anthropometry measurement and interpretation of weight, length/height, head circumference mid-arm circumference. Use of weighing machines, infanto meter. Interpretation of

Growth Charts: Road to Health card and percentile growth curves. Abnormal growth patterns - failure to thrive, short stature.

- Growth in relation to teeth, fontanel, paranasal sinuses, lymphoid tissue, brain and other organs.

- Normal development – Principles of development. Important milestones in infancy and early childhood.

- Gross Motor, Fine motor, Language and Personal-Social development. Normal pattern of sleep, sphincter control. Primitive reflexes.

- Causes and assessment of developmental retardation.

Desirable to Know

- Measurement and interpretation of sitting height, US:LS ratio and arm span.
- Age-independent anthropometric measurement□principles and application
- Sexual Maturity rating.
- Psychological and behavioral problems.

3. NUTRITION

Must Know

- Normal requirements of protein, carbohydrates, fats, minerals and vitamins for newborns, children and pregnant and lactating mother. Comon food sources.

- Breast feeding □ physiology of lactation, composition of breast milk. Colostrum. Initiation and technique of feeding. Exclusive breast feeding – Definition and benefits. Characteristic and advantages of breast milk as compared to bovine milk. Hazards and demerits of prelacteal feed, top milk and bottle feeding.

- Infant feeding/weaning foods, method of weaning. Feeding of normal infants and young children. Diet plan for different age groups based on sound principles.

- Protein energy malnutrition – Definition, classification according to IAP acute versus chronic malnutrition. Clinical features of marasmus & kwashiorkor. Causes and management of PEM including that of complications.

- Vitamins - Recognition of vitamin deficencies (A, D, E, K, C, B-Complex). Etiopathogenesis, clinical features, biochemical and radiological findings,

differential, diagnosis and management of nutritional rickets & scurvy. Hypervitaminosis A and D.

- Assessment of nutritional status of a child based on history and physical examination.

- Baby friendly hospital initiative (B.F.H.).

Desirable to Know :

- Prevention and management of lactational failure and feeding problems. Feeding in Special situations□LBW, congenital malformation, sick baby, caesarean delivery, maternal illness, infections and drug intake.

- Planning of therapeutic diet chart.

- Definition, causes and management of obesity.

4. IMMUNIZATION

Must Know

- Natural Immunization Programme. Immunization schedule according to IAP.

- Principle of Immunization, Vaccine preservation and cold-chain.

- Types, contents, efficacy storage, dose, site, route, contra-indications and adverse reactions of vaccines□BCG, DPT, OPV, Mealses, MMR, Hepatitis-B and Typhoid: Rationale and methodology of Pulse Polio immunization.

- Investigation and reporting of vaccine preventable diseases. AFA (Acute Flaccid Paralysis) surveillance.

Desirable to Know

- Special vaccines and their role - H. influenza B, Pneumococcal, Hepatitis A, Chickenpox, meningococcal, rabies.

5. INFECTIOUS DISEASES

Must Know

Epidemiology, basic pathology, natural history, symptoms, signs complications, investigations differential diagnosis, management and prevention of common bacterial, viral and parasitic infections in the region, with special reference to vaccine-preventable diseases.

Tuberculosis

Poliomyelitis

Diphtheria

Whooping cough

Tetanus including neonatal tetanus Measles.
Mumps

Rubella

Typhoid

Viral Hepatitis

Cholera

Chickenpox

Giardiasis

Amoebiasis.

Intestinal helminthiasis.

Malaria

Dengue fever

AIDS

Desirable to Know

Kala-azar

Leprosy

Chlamydia infection

6. INFECTIONS

Must Know

Etiopathogenesis, clinical features, laboratory diagnosis, differential diagnosis treatment and prevention of prevalent respiratory, gastro-intestinal, CNS, urinary and blood infections in neonates, infants and children. (Specific infections mentioned under systemic diseases below).

7. SYSTEMIC DISEASES

A. HEMATOLOGY

Must Know

- Clinical approach to a child with anemia with lymphadenopathy and/or hepatosplenomegaly.
- Causes of anemia in childhood. Classification based on etiology and morphology.
- Epidemiology, recognition, diagnosis, management and prevention of nutritional anemia – iron deficiency, megaloblastic.
- Epidemiology, clinical features, investigations and management of thalassemia.
- Diagnosis and management of acute lymphoblastic leukemia.

Desirable to Know

- Types, Clinical features, management of acute hemolytic anemia.
- Diagnosis and principles of management of Lymphomas.
- Basic investigations of bleeding and coagulation discords. Clinical features and management of hemophilia, ITP.

B. RESPIRATORY SYSTEM

Must Know

- Clinical approach to a child with cyanosis, respiratory distress, wheezing. Significance of recession, retraction.

- Etiopathogenesis, clinical features, complications, investigations, differential diagnosis and management of acute upper respiratory infections, pneumonia with emphasis on bronchopneumonia, bronchiolitis, bronchitis. Acute otitis media.

- Etiopathogenesis, clinical features, diagnosis, classification and management of bronchial asthma. Treatment of acute severe asthma.

- Pulmonary tuberculosis tuberculous infection versus tuberculous disease, difference between primary and post-primary tuberculosis. Etiopathogenesis, dianostic criteria in children versus adults. Diagnostic aids–technique and interpretation of Mantoux test and BCG test. Radiological patterns. Chemoprophylaxis and treatment.

- Diagnosis and management of foreign body aspiration. Differential diagnoses of stridor.

Desirable to Know

- Pathogenesis, clinical features and management of pneumothorax, pleural effusion and empyema.

C. GASTRO INTESTINAL TRACT

Must Know

- Clinical approach to a child with jaundice, vomiting, abdominal pain, bleeding, hepatosplenomegaly.
- Acute diarrhoeal disease Etiopathogensis, clinical differentiation of invasive and secretory diarrhoea, complications. Assessment of dehydration, treatment at home and in hospital. Fluid and electrolyte management. Oral rehydration, composition of ORS.
- Persistent and chronic diarrhoea, malabsorption, celiac disease.
- Common causes of constipation.
- Clinical features and management of ICC and portal hypertension.
- Management of acute and chronic viral hepatitis.

Desirable to Know

- Hirschprung diseases diagnosis and management.
- Cause, clinical features and management of Reye's syndrome, congenital pyloric stenosis and abdominal tuberculosis.
- Causes of chronic liver disease in childhood (various ages).

D. CNS

Must Know

- Clinical approach to a child with coma, convulsions, mental retardation.
- Clinical diagnosis, investigations and treatment of acute pyogenic meningitis, encephalitis & TBM.

- Seizure Disorder Causes and types of convulsions at different ages. Diagnosis, categorization & management of Epilepsy. Febrile convulsions - definition, types, management. Neurocysticecosis.

- Causes, diagnosis and management of cerebral palsy.

- Acute flaccid paralysis Differentiation between Polio and LGBS.

Desirable to Know

- Microcephaly, macrocephaly, chorea, infantile tremor syndrome and lemiplegia.

E. CARDIOVASCULAR SYSTEM

Must Know

- Clinical features, diagnosis, investigation, treatment and prevention of acute rheumatic fever. Common forms of rheumatic heart disease in childhood.

- Recognition of congenital acyanotic and cyanotic heart disease. Hemodynamics basic clinical features and management of VSD, PDA, ASD and Fallot's tetralogy.

- Recognition of congestive cardiac failure in children.

- Management of hypertension in children.

Desirable to Know

- Diagnosis and management of bacterial endocarditis, pericardial effusion, myocarditis.

F. GENITOURINARY SYSTEM

- Basic etiopathogenesis, clinical features, diagnosis, complications and management of acute poststreptococcal glomerulonephritis and nephrotic syndrome.

- Etiology, clinical features, diagnosis and management of urinary tract infection - actue and recurrent.

- Causes and diagnosis of obstructive uropathy in children.

Desirable to Know

- Diagnosis and principles of management of acute and chronic renal failure.

G. MISCELLANEOUS

Must Know

- Assessment and management of fluid, electrolyte and acid-base imbalance.

- Types of genetic disorder. Diagnosis of Down syndrome.

- Clinical approach to breath holding spells, nocturnal enuresis, temper tantrums, pica.

- Diagnosis and management of juvenile rheumatoid arthritis, Henoch Schonlein purpura.

- Practical aspects of child care - handling of babies, bathing, sponging, dressing, changing of napkins, measurement of temperature. Care of a sick child management of nappy rash, perianal excoriation, thrush, abdominal distension, Positiong of patient, care of eyes, ears and mouth. Suction, postural drainage prevention of bedsores.

8. NEONATOLOGY

Must Know

- Definition –live birth, neonatal periods, classification according to weight and gestation, mortality rates.

 Identification of antenatal, intra-partum and postnatal risk factors.

- Neonatal resuscitation - preparation, steps, APGAR scoring.
- Causes, systemic effects and management of birth asphyxia.
- Birth injuries-recognition, management. Differentiation of caput and cephalhematoma.

- Care of the normal newborn in the first week of life. Normal variations and clinical signs in the neonate.

- Identification of abnormal signs in early neonatal period- cyanosis, early jaundice, respiratory distress, bleeding, seizures, refusal to feed, abdominal distension, failure to pass meconium and urine.

- Identification of congenital anomalies at birth. Early intervention in specific malformationsanorectal anomalies, tracheo-esophageal fistula, diaphragmatic hernia, chonnal atresia, meningocoele.

NEONATAL JAUNDICE

- Physiological jaundice : Causes, clinical pattern, management. Differentiation from pathological jaundice. Approach to jaundice on the first D. Causes of hyperbilirubinemia and specific diagnosis. Indications, procedure, precautions and complications of phototherapy and exchange transfusion.

- Neonatal septicemia- etiology, approach to early diagnosis, principles of management. Common intrauterine infections. Superficial infections.

- Low birth weight babies – causes of prematurity and small-for-date baby, handicaps, clinical features and differentiation. Principles of gestational assessment. Basic management with emphasis on feeding and temperature regulation.

- Exclusive breast feeding – physiology and application. Feeding difficulties in newborn.

Desirable to Know

- Recognition and management of specific neonatal problems - hypoglycemia, hypocalcemia, anemia, seizures, necrotising enterocolitis, haemorrhage.

- Neonatal cholestasis - common causes, clinical features, investigations.

Note : Pediatric topics not mentioned above may be considered as 'nice to know'.

SKILLS

1. Obtain a proper relevant history, and perform a humane and through clinical examination of all organs/ systems in children including neonates.

2. Identify the problems and synthesize them to arrive at a logical working diagnosis after clinical examination.

3. Order appropriate investigations keeping in mind their relevance (need based) and cost effectiveness.

4. Plan and institute an individualised line of treatment which is need based, cost effective and appropriate for common ailments taking into consideration :

    a. Patient
    b. Disease
    c. Socio-economic status.
    d. Institutional/governmental guidelines.

5. Recognise situations which call for urgent or early treatment at secondary and tertiary centres and make a prompt referral of such patients after giving first aid or emergency treatment.

6. Demonstrate empathy and humane approach towards patients relatives and attendants.

7. Develop a proper attitude towards patients; colleagues and other staff.

8. Maintain an ethical behaviour in all aspects of medical practice.

9. Showing concern for mother's anxiety and properly undertake measures to alleviate the anxiety.

10. Demonstrate skill in communication of information to parents and relatives regarding the child's illness and health status.

11. Write a complete case record with all necessary details.

12. Monitor growth and development of children and differentiate normal from abnormal.

13. Assess degree of dehydration and manage fluid/ electrolyte and acid base imbalance.

Manage diarrhoeas Assess dehydration; prepare and administer oral rehydration therapy (ORT).

14. Detect and institute corrective measures for nutritional deficiency.

15. Identify prematurity using simple physical and neurological criteria.