

Syllabus

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596



**BACHELOR OF MEDICINE AND
BACHELOR OF SURGERY**

Course Code 001

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title of course:

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY – Abbreviated as MBBS

2.2 Objectives of course

i. National Goals

At the end of undergraduate programme, the medical student shall endeavour to be able to:

- a. recognize “health for all” as a national goal and health right of all citizens and by undergoing training for medical profession, fulfil his/her social obligations towards realization of this goal;
- b. learn every aspect of national policies on health and devote himself/herself to its practical implementation;
- c. achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases;
- d. develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living;
- e. Become exemplary citizen by observation of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

ii. Institutional Goals

In consonance with the national goals each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The undergraduate students coming out of a medical institute should:

- a. Be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations;
- b. Be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems;
- c. Appreciate rationale for different therapeutic modalities; be familiar with the administration of the “essential drugs” and their common side effects;
- d. Be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop human attitude towards the patients in discharging one’s professional responsibilities;
- e. Possess the attitude for continued self-learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills
- f. Be familiar with the basic factors which are essential for the implementation of the National Health Programmes including practical aspects of the following:
 1. Family Welfare and Maternal and Child Health(MCH),
 2. Sanitation and water supply,

3. Prevention and control of communicable and non-communicable diseases,
4. Immunization,
5. Health Education,
6. Indian Public Health Standard (IPHS) of health at various level of service delivery, medical waste disposal
7. Organisational & Institutional arrangements.
 - g. Acquire basic management skills in the area of human resources, materials and resource management related to health care delivery; General and Hospital Management, principal inventory skills and counselling.
 - h. Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures;
 - i. Be able to work as a leading partner in health care teams and acquire proficiency in communication skills;
 - j. Be competent to work in a variety of health care settings;
 - k. Have personal characteristics and attitudes required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

Graduate medical curriculum is oriented towards training students to undertake the responsibilities of a physician of first contact who is capable of looking after the preventive, promotive, curative and rehabilitative aspects of medicine.

To undertake the responsibilities of service situation which is a changing condition and of various types, it is essential to provide adequate placement training tailored to the needs of such services as to enable the graduates to become effective instruments of implementation of those requirements. To avail of opportunities and be able to conduct professional requirements, the graduate shall endeavour to have acquired basic training in different aspects of medical care.

It is important to make the physician capable of addressing the ethical dilemmas he will face during the practice. A physician trained should be able to identify analyse , make decisions and implement it on the basis of underlying ethical principles .This can be done only by integrating ethical principles in the curriculum.

The practice of medicine is becoming more and more re evidence based. The student should be able to use the evidence based scientific medicine in practice.

Being scientific and ethical is not enough to be a good practitioner of medicine, our students should be able to communicate well with the patients, relatives and the public and help them in decision making. This requires training in communication and counselling skills .It is important to introduce these skills as part of curriculum.

2.3 Medium of instruction:

Medium of instruction shall be English.

2.4 .Course outline

The Period of 4 ½ years is divided into three phases as follows:-

- a. Phase-I (2 semesters) – consisting of pre-clinical subjects (Human Anatomy, Physiology including Bio-Physics, Bio-chemistry 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)
- b. 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 detailed below in Phase III. Out of the time for Para-clinical teaching approximately equal time to be allotted to Pathology, Pharmacology, Microbiology and Forensic Medicine and Community Medicine combined (1/3 Forensic Medicine and 2/3 Community Medicine.
- c. Phase-III (Continuation of study of clinical subjects for seven semesters after passing Phase-I). The clinical subjects to be taught during Phase II and III are Medicine and its allied specialities, Surgery and its allied specialities, Obstetrics and Gynaecology and Community Medicine.

Besides clinical posting as per schedule mentioned herewith, rest of the teaching hours be divided for didactic lectures, demonstrations, seminars, group discussions, etc, in various subjects. The time distribution shall be as given in subject wise syllabus.

The Medicine and its allied specialities training will include General Medicine, Paediatrics, Tuberculosis and Chest, Skin and Sexually Transmitted Diseases, Psychiatry, Radio-Diagnosis, Infectious Diseases etc. The Surgery and its allied specialities training will include General Surgery, Orthopaedic Surgery including Physiotherapy and Rehabilitation, Ophthalmology, Otorhinolaryngology, Anaesthesia, Dentistry, Radio-therapy etc. The Obstetrics and Gynaecology training will include family medicine, family welfare planning etc.

(3) The first 2 semesters (approximately 240 teaching days) shall be occupied in the Phase I (Pre-clinical) subjects and introduction to a broader understanding of the perspectives of medical education leading to delivery of health care. No student shall be permitted to join the Phase II (Para-clinical/clinical) group of subjects until he has passed in all the Phase I (Pre-clinical) subjects.

(4) After passing pre-clinical subjects, 1½ year (3 semesters) shall be devoted to para-clinical subjects. Phase II will be devoted to para-clinical and clinical subjects, along with clinical postings. During clinical phase (Phase III) pre-clinical and para-clinical teaching will be integrated into the teaching of clinical subjects where relevant.

(5) Didactic lectures should not exceed one third of the time schedule, two third schedule should include practicals, clinicals or/and group discussions. Learning process should include living experiences, problem oriented approach, case studies and community health care activities.

2.5 Duration

Every student shall undergo a period of certified study extending over 4 ½ academic years divided into 9 semesters (i.e. of 6 months each) from the date of commencement of his study for the subjects comprising the medical curriculum to the date of completion of examination and followed by one-year compulsory rotating internship.

2.6 Syllabus

1. Phase Distribution and Timing of Examinations

The nine semesters of six months each are distributed to three phases as detailed below:

Phase	Semesters		Examination
Phase I	Semesters	I and II	I MBBS, Anatomy, Physiology, Biochemistry
Phase II	Semesters	III, IV and V	II MBBS, Pharmacology, Pathology, Microbiology, Forensic Medicine
Phase III	Semesters	VI and VII	III MBBS Part I Ophthalmology, Otolaryngology, Community Medicine
	Semesters	VIII and IX	III MBBS Part II General Medicine, General Surgery, Obstetrics and Gynaecology and Paediatrics

Note: Passing the 1st professional examination (I MBBS) is compulsory before proceeding to Phase II training.

A student, who fails in the IInd professional examination, shall not be allowed to appear in IIIrd professional Part I examination unless he passes all subjects of IInd professional examination.

(Passing in IIIrd professional (Part I) examination is not compulsory before entering into semesters VIII and IX training, however passing of IIIrd professional (Part I) is compulsory for appearing for IIIrd professional (Part II) examination.)

The following topics (Details under discussion) shall be incorporated in to the syllabus as deemed appropriate

1. Health Care Counselling
2. Ethics
3. Pain & palliation
4. Evidence based Medicine

5. Antibiotic stewardship

2.7 Total number of hours

First and second semesters -240 working teaching days

Semester I Time table

Day	8am - 9 am	9 am -10 am	10 am - 1 p.m	1p.m- to 2 p.m	2 p.m - 4 p.m.
Monday	Biochemistry	Physiology (9-11 a.m)	Anatomy dissection	Lunch	Practicals – PHY/BIO/HIST
Tuesday	Physiology	Biochemistry	Anatomy dissection		Practicals – PHY/BIO/HIST
Wednesday	Anatomy	Physiology	Anatomy dissection		Practicals – PHY/BIO/HIST
Thursday	Physiology	Biochemistry	Anatomy dissection		Practicals – PHY/BIO/HIST
Friday	Biochemistry	Anatomy	Anatomy Dissection (10 a.m-12p.m)		Physiology
Saturday	Anatomy	Physiology	Community medicine		ANA/BIO/PHY

Semester II Time table

Day	8am - 9 am	9 am -10 am	10 am - 12 noon	12 noon - to 1 p.m	1 p.m - 4 p.m.
Monday	Anatomy	Biochemistry	Practicals PHY/BIO/HIST		Anatomy dissection
Tuesday	Physiology	Anatomy	Practicals PHY/BIO/HIST		Anatomy dissection
Wednesday	Biochemistry	Physiology	Practicals PHY/BIO/HIST		Anatomy dissection
Thursday	Physiology	Biochemistry	Practicals PHY/BIO/HIST		Anatomy dissection
Friday	Anatomy	Biochemistry	Physiology		Anatomy dissection (2-4p.m)
Saturday	Biochemistry	Anatomy	Physiology		PHY/ANA/BIO/PHY

Third Semester classes: 18 weeks

Day	8am - 9 am	9 am -12	12 noon - 1 p.m	1- 2 p.m	2 p.m - 4 p.m.
Monday	Paraclinical lectures	Clinical posting	Paraclinical lectures		Practicals Para clinical
Tuesday	Paraclinical lectures	Clinical posting	Paraclinical lectures		Practicals Para clinical
Wednesday	Paraclinical lectures	Clinical posting	Paraclinical lectures		Practicals Para clinical
Thursday	Paraclinical lectures	Clinical posting	Paraclinical lectures		Practicals Para clinical
Friday	Paraclinical lectures	Clinical posting	Paraclinical lectures		Practicals Para clinical
Saturday	Paraclinical lectures	Clinical posting	Paraclinical lectures		Practicals Para clinical

Fourth and fifth Semester classes: 42 weeks

Day	8am - 9 am	9 am -12 noon	12 noon - 1 p.m	1- 2 p.m	2 p.m - 4 p.m.
Monday	Lectures in clinical subjects	Clinical posting	Lectures in Paraclinical subjects	Lunch	Practicals Para clinical
Tuesday	Lectures in clinical subjects	Clinical posting	Lectures in Paraclinical subjects		Practicals Para Clinical
Wednesday	Lectures in clinical subjects	Clinical posting	Lectures in Paraclinical subjects		Practicals Para clinical
Thursday	Lectures in clinical subjects	Clinical posting	Lectures in Paraclinical subjects		Practicals Para clinical

Friday	Lectures in clinical subjects	Clinical posting	Lectures in Paraclinical subjects		Practicals Para clinical
Saturday	Lectures in clinical subjects	Clinical posting	Lectures in Paraclinical		Practicals Para clinical

Sixth, Seventh, Eighth & Ninth Semester classes 82 weeks

Day	8am - 9 am	9 am -12 noon	12 noon - 1 p.m	1- 2 p.m	2 p.m - 4 p.m.
Monday	Lectures in Clinical subjects	Clinical posting	Lectures in Clinical		Practicals/ Demonstrations in Clinical Subjects
Tuesday	Lectures in Clinical subjects	Clinical posting	Lectures in Clinical		Practicals/ Demonstrations in Clinical Subjects
Wednesday	Lectures in Clinical subjects	Clinical posting	Lectures in Clinical Subjects		Practicals/ Demonstrations in Clinical Subjects
Thursday	Lectures in Clinical subjects	Clinical posting	Lectures in Clinical subjects		Practicals/Demonstrations in Clinical Subjects
Friday	Lectures in clinical subjects	Clinical posting	Lectures in Clinical subjects		Practicals/Demonstrations in Clinical Subjects
Saturday	Lectures in Clinical subjects	Clinical posting	Lectures in Clinical subjects		Practicals/Demonstrations in Clinical Subject

Note: These are suggested time tables. Adjustments where required, depending upon the availability of time and facility, are made. (***Institutional adjustments***)

2.8 Branches if any with definition

Present in clause 2.10 of the curriculum.

2.9 Teaching learning methods

As shown in clause 2.4 course outline.

2.10 Content of each subject in each year

HUMAN ANATOMY

(I) GOAL

The broad goal of 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

(II) OBJECTIVES

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

(A) Knowledge

- Comprehend the normal disposition, clinically relevant interrelationships, functional and cross sectional anatomy of the various structures in the body.
- 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.
- Comprehend the basic structure and connections of the central nervous system and analyse the integrative and regulative functions of the organs and systems. He/She shall be able to explain the developmental basis of the major variations and abnormalities.
- Demonstrate knowledge of the basic principles and sequential development of the Organs and systems; recognize the critical stages of development and the effects of common teratogen, genetic mutations and environmental hazards. He /She shall be able to explain the developmental basis of the major variations and abnormalities.

(B)Skills

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

- Identify and locate all the structures of the body and mark the topography of the living anatomy
- Identify the organs and tissues under the microscope
- Understand the principles of Karyotyping and identify the gross congenital anomalies.
- Understand principles of newer imaging techniques and interpretation of Computerized Tomography (CT) Scan sonogram etc.
- Understand clinical basis of some common clinical procedures i.e. intramuscular and intravenous injection, lumbar puncture and kidney biopsy etc.

(C)Integration

From the integrated teaching of other basic sciences, students shall 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.

(III) DETAILED SYLLABUS-DETAILS OF THE COURSE

Duration of the Course

Semesters	2
Total number of hours	650
Lectures	95
Seminars	37
Practicals	518

Innovation session (projects, structured discussion, integrated teaching, formative evaluation and revision) Part of practicals:

DETAILS OF LECTURES

1. General Anatomy : 15hr

- Epithelium: Classification, simple and compound epithelium, glandular and sensory epithelium : 2hr
- Connective tissue: Cells, matrix : 2hr
- Cartilage: Classification, structure, cells and matrix : 1hr
- Bone: Types, types of epiphysis, microscopy. Ossification in brief, blood supply : 2hr
- Joints: Classification and structure of synovial joint : 1hr
- Vascular tissue: Elastic artery, medium sized artery, large vein : 1hr
- Lymphatic tissue: General features, lymph node- structure and function, spleen, structure and circulation, Tonsil, Thymus : 2hr
- Muscular tissue: Structure of Skeletal, Smooth and cardiac Muscles : 1hr
- Skin: Structure of thin and thick skin : 1hr
- Nervous tissue: Neurons, Neuroglia, peripheral nerve structure optic nerve structure, Schwann cells, myelination, myelinated nerve fibre, Ganglia : 2hr

2General Embryology : 11hr

- Oogenesis, Ovarian Cycle :
1hr
- Menstrual cycle :
1hr
- Male reproductive system- Spermatogenesis :
1hr
- Fertilization, Implantation, assisted reproductive techniques :
1hr
- Bilaminar embryo :
1hr

- Trilaminar embryo : 1hr
- Intraembryonic mesoderm and folding of embryo : 2hr
- Formation and circulation of placenta : 1hr
- Foetal membranes : 1hr
- Twinning and teratology (Structure of Umbilical cord and placenta to be taught along with General Embryology) : 1hr

2 Gross Anatomy

(X-rays and surface marking of each region to be taken after the dissection of the corresponding region is completed)

Upper Limb : 4hr

- Brachial plexus : 1hr
- Mammary gland : 1hr
- Shoulder joint:
- Palmar space : 1hr

Seminars (Give more importance to applied Anatomy) : 8hr

- Axilla and Axillary artery : 1hr
- Venous and lymphatic drainage of upper limb : 1hr
- Radio-Ulnar joints, Pronation & supination : 1hr
- Brachial artery, Anastomoses around elbow joint : 1hr
- Radial nerve, Ulnar nerve, Median nerve : 2hr
- Retinacula : 1hr
- Elbow joint, wrist joint, 1st carpometacarpal Joint : 1hr

Lower Limb : 4hr

- Hip joint : 1hr
- Arches of foot : 1hr
- Knee joint : 1hr
- Development of Limbs, Dermatomes of Upper and Lower Limbs : 1hr

Seminars (Give more importance to applied Anatomy) : 6hr

- Venous and lymphatic drainage of lower limb : 1hr

- Femoral triangle, Adductor canal : 1hr
- Obturator nerve, Sciatic Nerve : 1hr
- Femoral artery and nerve : 1hr
- Ankle joint, Popliteal fossa : 1hr
- Sub talar joint, inversion and eversion : 1hr

Thorax : 9 hr

- Thoracic wall (including movements) : 1hr
- Pleura : 1hr
- Lungs including development of lung : 1hr
- Pericardium : 1hr
- Blood supply of heart : 1hr
- Arterial arches : 1hr
- Foetal circulation : 1hr
- Development of heart : 2hr

Seminars (Give more importance to applied Anatomy)

: 5hr

- Mediastinum-Boundaries and contents : 1hr
- Thoracic duct, Esophagus, Thoracic Aorta : 1hr
- Veins of Thorax: 1hr
- Chambers of heart-All chambers : 1hr
- Splanchnic nerves, sympathetic trunk : 1 hr

Genetics : 4hr

- Classification of chromosomes, karyotyping, sex chromosomes, Barr body : 1hr
- Normal male, normal female, Chromosomal aberrations-in brief : 1hr
- Turner's syndrome, Klinefelter's syndrome and Down's syndromes (Charts to be shown) Genetic Counseling, Pedigree Chart, Genetic Engineering and inheritance : 2hr

Head& Neck : 17hr

- Scalp : 1hr
- Parotid Gland : 1hr
- Development of face : 1hr
- Pituitary gland : 1hr
- Dural venous sinuses : 1hr
- Cervical fascia : 1hr
- Development of branchial arches : 1hr
- Extra Ocular muscles : 1hr
- T. M. Joint : 1hr
- Thyroid gland : 1hr
- Cervical Sympathetic : 1hr
- Pharynx : 1hr
- Larynx : 1hr
- Eyeball, Layers-development in brief : 1hr
- Tongue : 1hr
- Facial Nerve : 1hr
- Middle Ear : 1hr

Seminars (Give more importance to applied Anatomy) : 12hr

- Suboccipital triangle : 1hr
- Eyelid and lacrimal apparatus : 1hr
- Nasal cavity, PNS : 1hr
- Soft palate, Palatine tonsil : 1hr
- Muscles of facial expression : 1hr
- Vessels and nerves of the face : 1hr
- Posterior triangle of neck : 1hr
- Anterior triangles of neck : 1hr
- Mandibular nerve, oculomotor nerve : 1hr
- Submandibular and sublingual gland : 1hr
- Lymph nodes of head and neck : 1hr
- Hyoglossus muscle : 1hr

Brain and Spinal Cord :15Hr

- Spinal cord- external features and blood supply : 1hr
- Blood supply of brain- Superficialand deep, : 1hr
- Meninges & cisterns : 1 hr
- Medulla oblongata : 1hr
- Pons : 1hr

- Cerebellum : 1hr
- 4th Ventricle : 1hr
- 3rd Ventricle, Lateral ventricles : 1hr
- Midbrain : 1hr
- Sulci, gyri and functional areas of cortex : 1hr
- White matter & Internal capsule : 1hr
- Visual pathway : 1hr
- Basal ganglia : 1hr
- Thalamus : 1hr
- Development of CNS IN BRIEF including functional Column : 1hr

Abdomen, Pelvis, and Perineum : 16hrs

- Anterior abdominal wall and Rectus sheath : 1hr
- Inguinal canal, Spermatic cord and descent of testis : 1hr
- Peritoneum in brief : 1hr
- Development of GIT, derivatives and anomalies : 1hr
- Stomach including development : 1hr
- Portal vein : 1hr
- Liver : 1hr
- Kidney - gross features, development and anomalies : 1hr
- Diaphragm - gross features, development : 1hr
- Uterus - gross features, development and anomalies : 1hr
- Prostate and male urethra : 1hr
- Rectum and Anal canal : 1hr
- Urinary bladder : 1hr
- Perineal Pouches : 1hr
- Ischiorectal fossa : 1hr
- Pelvic floor : 1hr

Seminars (Give more importance to applied Anatomy Lymphatic drainage and blood supply of all organs should be given importance) : 6hr

- Duodenum and development : 1hr
- Pancreas, spleen : 1hr
- Extra hepatic biliary apparatus : 1hr
- Coeliac trunk, Supra renal gland : 1hr
- Ureter, Pudendal nerve : 1hr
- Caecum, Vermiform appendix : 1hr

Diagrams

I Cross Section Diagrams

A upper limb

No.	Name	Fig.	Pg.No	Book
1.	Section through middle of arm	68	68	Cunningham's manual of practical Anatomy 15th Edn Vol. 1
2.	Oblique section through the hand	88	90	Cunningham's manual of practical Anatomy 15th Edn Vol. 1
B. Lower limb				
1.	Transverse section through middle of right thigh	80.2	1351	Gray's Anatomy 40 th Edn
2.	Transverse section through middle of leg	182	196	Cunningham's manual of practical Anatomy 15th Edn Vol. 1
3.	Transverse section through knee joint	202	218	Cunningham's manual of practical Anatomy 15th Edn vol.1
C. Neck				
	Transverse section through the neck at the level of cricoid(C6 level) cartilage	62	76	Cunningham's manual of practical Anatomy 15th Edn Vol-3
D. Thorax				
1	Horizontal section through the thorax at the level of T-4 Vertebra	70	58	Cunningham's manual of practical Anatomy 15th Edn Vol-2
E. Abdomen				
1	Horizontal section through the abdomen at the level of epiploic foramen-T12 vertebra	139	124	Cunningham's manual of practical Anatomy 15th Edn Vol-2
2	Horizontal section through the abdomen at the level pylorus - L1 vertebra	128	116	Cunningham's manual of practical Anatomy 15th Edn Vol-2
3	Horizontal section through the abdomen at the level of -L4	129	116	Cunningham's manual of practical Anatomy 15th Edn Vol-2
F. Brain				
1	Transverse section of spinal cord showing ascending & descending tracts.	6.8	80	IB singh Text Book of Neuro Anatomy 9 th Edn.
2	Transverse section of medulla at the level of Pyramidal decussation	8.2	96	IB singh Text Book of Neuro Anatomy 9 th Edn.
3	Transverse section of medulla at the level of sensory decussation	8.3	97	IB singh Text Book of Neuro Anatomy 9 th Edn.
4	Transverse section of medulla at the level of olive	8.4	98	IB singh Text Book of Neuro Anatomy 9 th Edn.

5	Transverse section at the level of lower part of pons (at the level of facial colliculus)	8.9	102	IB singh Text Book of Neuro Anatomy 9 th Edn.
6	Transverse section at the level of upper part of pons	8.11	104	IB singh Text Book of Neuro Anatomy 9 th Edn.
7	Transverse section at the level of lower part of mid brain (at the level of inferior colliculus)	8.16	106	IB singh Text Book of Neuro Anatomy 9 th Edn.
8	Transverse section at the level of upper part of mid brain (at the level of superior colliculus)	8.19	108	IB singh Text Book of Neuro Anatomy 9 th Edn.
9	Horizontal section at the level of inter ventricular foramen	282	286	Cunningham's manual of practical Anatomy 15th Edn Vol-3
	II SAGITTAL SECTION			
1	Sagittal section through shoulder	64	65	Cunningham's manual of practical Anatomy 15th Edn Vol-1
2	Median section of brain	238	255	Cunningham's manual of practical Anatomy 15th Edn Vol-3
3	Median section through male pelvis	235	216	Cunningham's manual of practical Anatomy 15th Edn Vol-2
4	Median section through female pelvis	236	216	Cunningham's manual of practical Anatomy 15th Edn Vol-2
	111 GROSS ANATOMY			
A	Upper limb			
1	Typical spinal Nerve	2	6	Cunningham's manual of practical Anatomy 15th Edn Vol-1
2	Brachial plexus	24	33	Cunningham's manual of practical Anatomy 15th Edn Vol-1
3	Anastomosis around elbow joint	80	82	Cunningham's manual of practical Anatomy 15th Edn Vol-1
4	Superficial palmar arch 4 Deep palmar arch	90	92	Cunningham's manual of practical Anatomy 15th Edn Vol-1
B	Lower limb			
1	Femoral triangle	131	140	Cunningham's manual of practical Anatomy 15th Edn Vol-1
2	Longitudinal arches of foot - Medial -	213	226	Cunningham's manual of practical Anatomy 15th Edn Vol-1

3	Structures surrounding the hip joint	81.5	1377	Gray's Anatomy 41 st Edn.
C	Thorax			
1	Typical intercostal space	16	12	Cunningham's manual of practical Anatomy 15th Edn Vol-2
2	Relations of heart & great vessels to the anterior wall of thorax Surfacemarking- Borders , Surfaces, valves of heart)	53	44	Cunningham's manual of practical Anatomy 15th Edn Vol-2
3	Sternocostal surface of the heart	51	41	Cunningham's manual of practical Anatomy 15th Edn Vol-2
4	Mediastinal surface of lung -Left lung	40	32	Cunningham's manual of practical Anatomy 15th Edn Vol-2
5	Mediastinal surface of lung - Right lung	41	33	Cunningham's manual of practical Anatomy 15th Edn Vol-2
d. Abdomen				
1	Visceral surface of liver	176	156	Cunningham's manual of practical Anatomy 15th Edn Vol-2
2	Structures seen posterior to the stomach	149	132	Cunningham's manual of practical Anatomy 15th Edn Vol-2
3	Anterior surface of right and left kidneys showing relations	191	169	Cunningham's manual of practical Anatomy 15th Edn Vol-2
4	Posterior surface of right and left kidneys showing	190	168	Cunningham's manual of practical Anatomy 15th Edn Vol-2
e. Head and neck				
1	Diagrammatic section of eyeball	164	184	Cunningham's manual of practical Anatomy 15th Edn Vol-3
2	Dissection of submandibular region showing hyoglossus muscle	111	131	Cunningham's manual of practical Anatomy 15th Edn Vol-3
3	Distribution of cutaneous nerves to Head & Neck	75	98	Cunningham's manual of practical Anatomy 15th Edn Vol-3
f. Brain				
1	Circle of willis	196	218	Cunningham's manual of practical Anatomy 15th Edn Vol-3
2	Blood supply of cerebrum			
a	Inferior Surface	197	198	Cunningham's manual of practical Anatomy 15th Edn Vol-3

b	Superolateral surface	201	221	Cunningham's manual of practical Anatomy 15th Edn Vol-3
c	Medial surface	232	250	Cunningham's manual of practical Anatomy 15th Edn Vol-3
6	Floor of IV ventricle- posterior view	227	243	Cunningham's manual of practical Anatomy 15th Edn Vol-3
7	Sulci, gyri of cerebral hemisphere			
a	Superolateral surface	13.6A	182	IB singh Text Book of Neuro Anatomy 9 th Edn.
b	Medial surface	13.8A	184	IB singh Text Book of Neuro Anatomy 9 th Edn.
c	Inferior Surface	13.10 A	186	IB singh Text Book of Neuro Anatomy 9 th Edn.

The question on the diagrams in the question paper carrying 4 marks

(2marks each in both Paper 1 & paper 2 should be STRICTLY limited from the above list only)

DETAILS OF PRACTICALS- Dissection including Osteology and Histology)

Upper Limb

: 60hrs

- Introduction, Pectoral region and axilla, cutaneous nerves and vessels
- The brachial plexus, Axillary artery
- The dissection of back
- The free upper limb Lymph vesels and lymph nodes of upper limb cutaneous nerves of upper limb and deep fascia of upper limb
- The shoulder- movements of the limb at the shoulder, the shoulder joint
- The arm- Cubital fossa, anterior compartment, Posterior compartment of arm
- The forearm and hand, Palmar aponeurosis, superficial palmar arch, Flexor retinaculum, Flexor tendons
- The arteries and nerves of the flexor compartment of the forearm
- Muscles of the front of the forearm and hand, deep palmar arch, Fascial compartments of the palm
- The extensor compartment of the forearm and the hand, Extensor tendons of the fingers Joints of the upper limb
- Elbow joint, wrist joint, radio ulnar joints, intercarpal , carpo metacarpal & Intermetacarpal joints

Lower limb

: 60 hrs

- Front of thigh, femoral triangle, adductor canal
- Medial side of thigh

- Gluteal region
- Popliteal fossa
- Back of thigh
- Hip joint
- Front of leg and dorsum of foot, superficial dissection
- Anterior compartment of leg
- Lateral and medial compartments of leg, back of leg
- Sole of the foot I and II layers, III and IV layers, V and VI layers
- Knee joint, Ankle joint, Tibio-fibular and other joints, revision

Thorax

: 30hrs

- Introduction: Walls of thorax,
- Cavity of thorax, pleura
- Mediastinum, Root of lungs Autonomic nervous system
- The lungs, Anterior mediastinum
- Middle mediastinum, surface anatomy of the heart, blood supply
- Chambers of heart, right atrium, right ventricle, left ventricle
- Aorta, superior mediastinum arch of aorta, left atrium
- Conducting system of heart, Thoracic part of aorta Vagus, Oesophagus, Thoracic duct, Posterior intercostal vessels,
- Joints of thorax, Revision

Head & Neck

: 130 hrs

- Cervical vertebrae, Skull, The scalp
- The temple and the face, Nerves and vessels of scalp and superficial temporal region, The superficial dissection of face
- The side of the neck, Posterior triangle, Sub occipital triangle
- The anterior triangle of neck, The median region of the front of neck, subdivisions of anterior triangle,
- The cranial cavity: Structures seen after removal of cerebrum, Anterior cranial fossa, middle cranial fossa, posterior cranial fossa
- Deep dissection of the face: Nerves of the face, Structures in the cheek and lips The eyelids, The lacrimal apparatus
- The orbits, The structures in the orbits, extraocular muscles, nerves, ophthalmic artery
- The parotid region, The parotid gland, facial nerve, vessels
- The temporal and infratemporal region Temporal fascia, Temporalis muscle The Superficial contents of the infratemporal fossa Temporomandibular joint, The deeper contents of the infratemporal fossa,
- the submandibular gland, mylohyoid muscle, hyoglossus
- The mouth and pharynx, Pharyngeal wall, subdivisions of pharynx, soft palate
- The cavity of the nose, nasal septum, lateral wall
- The larynx,
- The tongue
- The organs of hearing and equilibrium

- The eye ball
- The contents of the vertebral canal,
- The joints of the neck.

Brain

: 42 hrs

- Introduction: The membranes of the brain- meninges
- The blood vessels of the brain
- The medulla, pons,
- The cerebellum, The fourth ventricle The midbrain,
- The cerebrum – sulci, gyri & functional areas
- The White matter of cerebrum III ventricle, the lateral ventricle and the choroid fissure
- The thalami and the optic tracts
- The deep dissection of the hemisphere, deep nuclei of the telencephalon, The nuclei and connections of the thalamus, Cerebral topography

Abdomen

: 124 hrs

- Introduction: Anterior abdominal wall muscles, inguinal canal Nerves and vessels of anterior abdominal wall
- Male external genital organs
- Dissection of the loin
- Abdominal Cavity Shape, Boundaries, Divisions of peritoneal cavity Ligaments of liver, Spleen
- Oesophagus, Vagal trunk, Stomach
- Mesentery, Superior mesenteric artery, Inferior mesenteric artery, Arterial anastomosis in GI tract, Structure of small intestine, Large intestine
- Duodenum, Portal vein, Ducts of liver Pancreas, Liver, Gall bladder, Cystic duct
- Abdominal structures in contact with diaphragm Autonomic nervous system Supra renal glands, The kidneys, Abdominal part of ureter
- The diaphragm, The posteriorabdominal wall muscles,The inferior vena cava, Lymph nodes of posteior abdominal wall, The nerves of posterior abdominal wall,
- The pelvic viscera, ovaries, uterine tubes,Pelvic part of ureters
- Urinary bladder, Internal surface of urinary bladder, Ductus deferens, Prostate, Male urethra,
- Uterus, Rectum, Anal canal
- Vessels of lesser pelvis, nerves of lesser pelvis, Obturator nerve, Autonomic nerves
- The muscles of lesser pelvis, pelvic diaphragm
- Joints of pelvis

Perineum

:12 hrs

- Ischiorectal fossa,
- Perineal pouches Perineal body, Pudendal canal

Histology

: 60 hrs

- Epithelium
- Connective tissue

- Cartilage- Hyaline, elastic, fibro cartilage
- Bone- Compact bone- C.S & L.S
- Muscles- Skeletal, Smooth, cardiac
- Nervous tissue- neuron, nerve fibre, sciatic and optic nerves, sympathetic, spinal ganglia
- Blood vessel- Large and medium sized artery, large and medium sized vein
- Lymphoid tissue- lymph node, spleen, thymus, palatine tonsil
- Skin- thin, thick
- Mammary gland-active & inactive
- Placenta & umbilical cord
- Respiratory system- trachea & lung
- Nervous system- spinal cord, cerebrum cerebellum
- Cornea, retina
- Endocrine system- thyroid, parathyroid, supra renal, pituitary
- Excretory system- kidney, ureter, urinary bladder
- Reproductive system
 - a) Male - Testis epididymis, vas deferens, prostate
 - b) Female – ovary, uterus- proliferative and secretory, cervix, fallopian tube

Digestive system

- Salivary glands - mucous, serous & mixed,
- Pancreas, liver, gall bladder,
- Tongue – filiform, fungiform & circumvallate,
- Oesophagus stomach-fundus, pylorus,
- Duodenum, jejunum, ileum,
- Large intestine, vermiform appendix

Genetics

- Demonstration of karyotyping charts- Normal male, Normal female, Down syndrome, Turner's Syndrome, Klinefelter's Syndrome, Chromosome spread

Prescribed text books

1. Cunningham's Manual of Practical Anatomy-3 Volumes
2. Essentials of Human Anatomy-A.K.Datta, 3 Volumes
3. Inderbir Singh's Text Book of Anatomy -3 volumes
4. Human Embryology - I.B.Singh
5. IB Singh's Text Book of Human Neuro Anatomy
6. Human Neuro Anatomy-Vishram Singh
7. Text Book of Human Histology-Inder Bir Singh
8. Surface and Radiological Anatomy-A. Halim & A.C.Das
9. Text Book of Osteology by I.B.Singh
10. Text Book of General Anatomy-G.P.Pal
11. Clinically Anatomy-A Problem solving approach by Neeta V Kulkarni -2 Volumes
12. Gross Anatomy Text Books (3 Vol) – Dr. Vishram Singh

Reference text Books

1. Gray's Anatomy
2. Cunningham's text book of Anatomy
3. Grant's Atlas of Anatomy
4. Langman's Medical Embryology- T. W. Sadler
5. Clinical Neuro Anatomy- Richard S Snell
6. Essentials of Human Embryology- A. K. Datta
7. Essentials of Human Genetics- Bhatnagar, Kothari and Lopa Mehta
8. Histology Atlas- De Fiore
9. Text Book of Histology -Hamilton Bailey
10. Clinically Oriented Anatomy- Keith L Moore
11. Gray's Anatomy for students- Richard L Drake
12. The Developing Human- Moore and Persaud
13. Clinical Anatomy by Regions Richard S Snell
14. Human genetics -S.D.Gangane
15. Text Book of Human Histology-Gunasekharan

Evaluation

University Examination

Theory

Paper I - 50 marks ,

Paper II

- 50 marks

Viva Voce – 20 marks – 4 stations, Embryology, Osteology, Radiology,

Surface marking

Theory-Topic Division

Paper I - General Embryology, General Anatomy, Genetics, Upper Limb, Lower Limb, Thorax

Paper II - Head and Neck, Brain, Abdomen, Pelvis, Perineum

University Practicals

Total 40 marks

- Histology - 15 marks
 - a) 14 spotters of ½ mark each to include one Karyotype also
 - b) Discussion 2 slides, one systemic and one general = 4 marks each
- Gross Anatomy - 25 marks
 - a) 10 spotters X 1 mark = 10 marks
 - b) Discussion
 - i) Above diaphragm – 8 marks
 - ii) Below diaphragm – 7 marks

BIOCHEMISTRY

(INCLUDING MEDICAL PHYSICS AND MOLECULAR BIOLOGY)

I) GOAL

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

II) OBJECTIVES

(A) Knowledge: At the end of the course, the student shall be able to;

- (a) Describe the molecular and functional organization of a cell and lists its sub cellular components.
- (b) Delineate structure, function and inter-relationship of biomolecules and consequences of deviation from normal.
- (c) Summarize the basic and clinical aspects of Enzymology with emphasis on diagnostic enzymes.
- (d) Describe digestion & assimilation of nutrients and consequences of malnutrition
- (e) Integrate the various aspects of metabolism and their regulatory pathways
- (f) Explain the biochemical basis of inherited disorders with their associated consequence
- (g) Describe mechanisms involved in maintenance of body fluid, and pH homeostasis
- (h) Outline the molecular mechanisms of gene expression and regulations, the principles of genetic engineering and their application in medicine.
- (i) Summarize the molecular concept of defenses and their application in medicine.
- (j) Outline the biochemical basis of environmental health hazards, biochemical basis of cancer and carcinogenesis
- (k) Familiarize with the principles of various conventional and specialized laboratory investigations, instrumentation analysis and interpretation of a given data.
- (l) Suggest experiments to support theoretical concepts and clinical diagnosis.

(B) Skills At the end of the course, the student shall be able to

1. Make use of conventional techniques and 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 Medical Biochemistry shall help the students to integrate molecular events with structure and function of the human body in health and diseases.

DURATION

Duration of the course: 2 semesters

Total number of hours: 240 (Lectures: 160 Hours & Practicals and Innovative sessions: 80Hrs) Innovative sessions include projects, seminars, structured discussion, integrated teaching, formative evaluation and revision

DETAILED SYLLABUS DETAILS OF COURSE BIOCHEMISTRY:

- Essays must be framed from topics with three stars.
- Five and three marks questions must be framed from topics with three stars or two stars.

[THEORY: 160Hrs]

PAPER 1 (90Hrs)

S NO	TOPICS	Hrs
1	CELL	(2Hrs)
1.1	**Structure and Functions of cell and cellular organelles	1Hr
1.2	** Diseases associated withorganelle. Fractionation of organelles (in brief) and their marker enzymes	1Hr
2	BIOMOLECULES	(15Hr)

2.1	PROTEINS: ** Classification of aminoacids based on structure, metabolic fate, nutritive value	1Hr
2.2	**Properties of amino acids: Ionic properties of amino acids, Isoelectric pH and its importance; Buffering action of aminoacids and proteins	1Hr
2.3	**Peptide bonds; Biologically important peptides; ***Structural organization of proteins Primary Structure of insulin	1Hr
2.4	**Secondary structure	1 Hr
2.5	**Tertiary and Quaternary structure ; Myoglobin, Collagen and hemoglobin; Protein folding in brief, Prion Diseases	1Hr
2.6	*Proteins: Classification based on composition & solubility, shape, function and nutritional value, limiting aminoacids and mutual supplementation	1Hr
2.7	**Denaturation, Coagulation; Precipitation of protein –Isoelectric precipitation , precipitation using salts ,heavy metals and organic solvents	1Hr
2.8	CARBOHYDRATES: **Classification,**Isomerism	1Hr
2.9	*Reactions: Reducing property ,Oxidation, Reduction, Dehydration and Condensation (Details of reactions along with practicals)	1Hr
2.10	*Glycosidic bonds – N linked & O linked with examples *Amino sugars, deoxy sugars with examples *Disaccharides – reducing & nonreducing , Highlight clinical importance of lactulose	1Hr
2.11	**Polysaccharides : Homopolysaccharides , Heteropolysaccharides **Glycosaminoglycans – composition, distribution and function * mucopolysaccharidosis – Types ,common features & enzyme deficiency	1 Hr
2.12	*Blood group antigens – Basic composition &Types **Dietary fibre – Definition, types function & clinical significance	1Hr

2.13	LIPIDS: ** Definition, Classification with examples * Fatty acids: Definition, Alpha and omega numbering system, Classification ; Clinical significance of MUFA & PUFA; Essential fatty acids; Trans fatty acids	1 Hr
2.14	*Cholesterol : Structure, Biologically important compounds derived *TAG : Composition & Function **Phospholipids – Composition & Functions *Phospholipases- Clinical highlights: Viper venom ,Respiratory distress syndrome	1 Hr
2.15	** Membranes : Structure & Composition (Functions will be dealt in Physiology classes) *Micelle & Liposomes	1Hr
3	ENZYMES	(7Hrs)
3.1	**Definition, IUBMB classification with examples, Coenzymes & Cofactors	1Hr
3.2	**Concept of active site, Specificity of enzymes ;Factors affecting enzyme activity , Km value and its significance	1Hr
3.3	***Enzyme inhibition : Competitive, noncompetitive, uncompetitive with examples	1 Hr
3.4	***Suicidal inhibition, Allosteric inhibition and feedback inhibition with examples (High light : Enzyme inhibition and drug designing)	1 Hr
3.5	*** Enzyme regulation in biological systems – Compartmentalization,allosteric regulation, covalent modification, zymogen activation, induction , repression & Derepression	1Hr
3.6	** Clinical enzymology: Diagnostic importance of enzymes ; Functional & non functional enzymes; **Iso-enzymes : Definition, Separation and examples – CPK & LDH	1 Hr
3.7	**Other enzymes of diagnostic importance: Transaminases(AST,ALT), ALP,GGT,NTP,ACP,Amylase,Lipase,Choline esterase,Enolase	1Hr

	*Therapeutic enzymes *Enzymes used in laboratory techniques	
4	DIGESTION AND ABSORPTION	(4)
4.1	CARBOHYDRATES: **Digestion, Absorption, Glucose transporters (mechanism not needed) (Emphasize the relation of salt in the diet & ORS) ** Significance of dietary fibre *Glycemic index: Definition & Clinical significance *Malabsorption: Lactose intolerance	1Hr
4.2	LIPIDS: ***Digestion ,Role of bile salts & micelle *Absorption of lipids ; *Malabsorption: Steatorrhea	2 Hr
4.3	PROTEINS: *Digestion & Absorption, Meister cycle	1Hr
4.4	*Nitrogen balance, PEM, Definition of balanced diet, Limiting amino acids, BMR	1Hr
5	METABOLISM OF CARBOHYDRATES	(19)
5.1	***Glycolysis ; Definition, reactions, energetics, rate limiting step, Regulation	2Hrs
5.2	**Rappaport Lubering pathway, Significance of 2,3 BPG, Cori's cycle	
5.3	**Fate of pyruvate, PDH reaction, lactic acidosis with two examples	1Hr
5.4	***Gluconeogenesis ; Definition, substrates, reactions & key enzymes,	2 Hrs
5.5	Regulation, Significance, *, Glucose alanine cycle	
5.6	**Glycogenesis	3Hrs
5.7	Glycogenolysis; Regulation in brief	
5.8	*Glycogen storage disorders – Von Gierke's disease in detail	
5.9	**HMP shunt pathway; Tissues operating , Oxidative phase in detail & mention the products of non oxidative phase,	2Hrs

5.10	**Significance of HMP shunt pathway,G6PD,Transketolase	
5.11	**Minor sugars; Galactose metabolism & disorders ; Fructose metabolism & disorders	1Hr
5.12	*Uronic acid pathway in brief, Significance of the pathway,Pentosuria;Polyol pathway and its importance	1Hr
5.13	***Regulation of blood glucose : Fed & fasting state; Organs, Glucose transporters, Hormones, Enzymes involved	1Hr
5.14	**Insulin : Receptor ,mechanism of action, insulin release , Actions of insulin related to metabolism in brief	1Hr
5.15	***Diabetes Mellitus: Definition ,Types & etiology ,Diagnostic criteria, Metabolic derangements	1Hr
5.16	***Acute & chronic complications (Biochemical basis)	2Hrs
5.17	***Laboratory diagnosis and monitoring of glycemic control and complications	
5.18	**GTT: Indications, Procedure, Interpretation .Types of GTT curves. Mini GTT,Extended GTT,IV GTT & GCT in brief	1 Hr
5.19	**Hypoglycemia:Definition,causes,clinical features ,biochemical basis of Management, Glycosurias and reducing substances	1 Hr
6	METABOLISM OF LIPIDS	(18Hrs)
6.1	**Fatty acid biosynthesis: Fatty acid Synthase complex, reactions ; Regulation ;	2 Hrs
6.2	*Elongation and desaturation of fatty acids	
6.3	Fatty acid oxidation:*** Beta oxidation ; Definition, Fatty acid transport	2 Hrs
6.4	&carnitine,steps.	

	Energetics ,regulation & disorders	
6.5	**Oxidation of odd chain fatty acid & fate of propionylcoA	2Hrs
6.6	*Oxidation of unsaturated fatty acid & very long chain fatty acid *Alpha & Omega oxidation of fatty acid; in brief ; * In born errors associated	
6.7	***Ketone bodies : Formation & utilization	1Hr
6.8	***Metabolic background of ketoacidosis in DM and starvation and differential diagnosis by laboratory	1Hr
6.9	**Adipose tissue : Types, Liver adipose tissue axis , Adipokines ; Hormone sensitive lipase	1Hr
6.10	**Fatty liver: Causes, Lipotropic factors, fate of fatty liver	1Hr
6.11	**Cholesterol : Synthesis up to mevalonate in detail and mention the intermediates of important reactions up to cholesterol, Regulation	1 Hr
6.12	**Metabolic fate: Formation of bile salts and its significance , Mention other biologically compounds derived from cholesterol	1Hr
6.13	**Lipoproteins : Definition, General structure of lipoproteins, classification,	2Hrs
6.14	separation; ***Metabolism of chylomicrons	
6.15	***Metabolism of VLDL & LDL	1 Hr
6.16	***Metabolism of HDL **Different types of HDL & Lp(a) and their significance	1Hr
6.17	*Lipid profile; Dyslipidemia; Dietary management & role of statins Lipid storage disorders : NiemannPick,Taysach's,Gaucher's,Fabry'sdisease in brief	1Hr
6.18	Eicosanoids : ** Prostaglandins & Thromboxanes ; Major steps of formation;**Biochemical actions & therapeutic uses*Mention Leukotrienes&Lipoxins	1Hr
7	METABOLISM OF AMINOACIDS	(20Hrs)

7.1	*Dynamic state of body proteins, Body aminoacid pool; Inter organ transport of amino acids,* Nitrogen balance and PEM	1 Hr
7.2	**Reactions; Transdeamination (transamination + Oxidative deamination); Non oxidative deamination	1Hr
7.3	***Formation and detoxification of ammonia (urea Cycle)	2Hrs
7.4	Regulation, Energetics, Hyperammonemia ,Biochemical basis of management of hyperammonemia	
7.5	**One carbon metabolism	1Hr
7.6	***Metabolism of glycine:, Compounds synthesized and inborn errors	2 Hrs
7.7	**metabolism of serine, role as a component of proteins	1Hrs
7.8	**Metabolism of Sulfur containing amino acids: Metabolism of Cysteine	2Hrs
7.9	Glutathione,Taurine,Transsulfuration,PAPS ;*Excretion of Sulfur	
7.10	**Metabolism of Methionine,Transmethylation	2Hrs
7.11	Inborn errors associated with metabolism of S containing amino acids	
7.12	***Metabolism of aromatic amino acids: Phenyl alanine and tyrosine; Compounds	3Hrs
7.13	synthesized, Inborn errors associated	
7.14	**Catabolism of catecholamines ,VMA formation & excretion and its significance	
7.15	**Metabolism of Tryptophan and compounds (niacin melatonin, serotonin,	2Hrs
7.16	indoxyl) formed in brief **Hartnup disease and its diagnosis** Effect of PLP on Tryptophan metabolism *Formation and excretion of 5HIAA and its clinical significance	
7.17	* Histidine metabolism & Inborn error associated**FIGLU excretion test	1Hr
	*Glutamic acid ,GABA; Glutamine ; *Aspartic acid ,Asparagine	
7.18	*Metabolism of Arginine, NO, Polyamines.	3Hrs
7.19	*Branched chain aminoacid metabolism (1 st two steps only required) &MSUD	
7.20	*Biologically important amines ; *Amino acids and amino acid derivatives acting as neurotransmitters ; *Organic acidurias	
8	TRICARBOXYLIC ACID (TCA) CYCLE & ELECTRON TRANSPORT CHAIN (ETC)	(4Hrs)

8.1	***TCA Cycle: Final Common oxidative Pathway of metabolism	2 Hrs
8.2	Reactions, regulation, energetics & inhibitors; Anaplerotic reactions; Amphibolic role	
8.3	**High energy compounds: definition and examples	2Hrs
8.4	***ETC : Components and sites of ATP synthesis; Mechanism of oxidative phosphorylation; ATP synthase Inhibitors **Brown adipose tissue	
8.5	** integration of metabolism, Adaptations in starvation: Life style diseases, BMI obesity, Metabolic syndrome (Mention NASH, PCOS) Atherosclerosis	2 Hrs
PAPER 2 (70Hrs)		
9	METABOLISM OF HEME	(8 Hrs)
9.1	***Heme synthesis : Heme synthetic pathway ,regulation & effects of lead poisoning	2Hrs
9.2		
9.3	**Porphyrias: Types, Enzyme defects, manifestations and investigations of blood & urine (Acute intermittent Porphyria in detail and others in brief)	1Hr
9.4	***Heme catabolism: Formation & fate of bilirubin (uptake, conjugation, secretion) ; Formation & Fate of urobilinogen & stercobilinogen	1Hr
9.5	***Serum bilirubin: Types, Blood levels in healthy subjects ; Properties;	2Hrs
9.6	***Jaundice: Definition, Classification , Causes & differential diagnosis by biochemical tests	
9.7	*Neonatal hyperbilirubinemia , Kernicterus & biochemical basis of treatment in brief	1Hr
9.8	*Haemoglobinopathies : Different types and Hbs in detail (Hb electrophoresis , Sickling test) *Thalassemias : Alpha and beta thalassemia in brief	1Hr
10	FAT SOLUBLE VITAMINS	(5Hrs)
10.1	***Vitamin A : Different chemical forms, dietary sources, RDA Vitamin A;	2Hrs
10.2	Absorption , transport and storage; Functions of vitamin A , Wald's visual cycle	
	Deficiency manifestations and its prevention ; Hyper vitaminosis	

10.3	***Vitamin D : Chemical nature , dietary sources, RDA Vitamin D;	2Hrs
10.4	Active form of vitamin D – its formation and actions Deficiency manifestations in children and adults and its prevention	
10.5	**Vitamin K : Chemical forms, dietary sources, biochemical Functions ,RDA and deficiency manifestations Highlight: Vitamin K administration to preterm babies &Vitamin K and Prothrombin time **Vitamin E : Chemical forms, Biochemical Functions (focus lipid peroxidation and antioxidant function in brief) and deficiency manifestations	1Hr
11	WATER SOLUBLE VITAMINS	(6Hrs)
11.1	**Thiamine : Chemical nature, dietary sources, RDA,coenzyme form, biochemical functions , deficiency manifestations High light : Transketolase assay to detect deficiency	1Hr
11.2	*Riboflavin, Pyridoxine : Chemical nature, dietary sources,RDA, coenzyme form, biochemical functions , deficiency manifestations	1Hr
11.3	*Pantothenic acid, Niacin, Biotin : Chemical nature, dietary sources, RDA, Coenzyme form, biochemical functions , deficiency manifestations	1Hr
11.4	*Folic acid : Chemical nature, dietary sources, RDA,coenzyme form, biochemical functions , deficiency manifestations (One carbon metabolism along with amino acid metabolism)	1Hr
11.5	**Vitamin B₁₂, Vitamin C : Chemical nature, dietary sources, RDA, role as coenzymes	2Hrs
11.6	Biochemical functions, deficiency manifestations ; *Antivitamins	
12	MINERALS	(6Hrs)
12.1	*Classification of minerals based on RDA	2Hrs
12.2	**Calcium : Dietary sources, biochemical functions, RDA, Blood levels in healthy subjects, regulation of blood calcium level, Hypocalcaemia, Hypocalcaemia.	
12.3	Phosphorus, Magnesium, Copper : Dietary sources, biochemical functions ,RDA,	1Hr

	Disorders related.	
12.4	***Iron: Dietary sources, RDA,; Absorption ,transport &storage; Causes of iron	2Hrs
12.5	deficiency & Iron deficiency Anemia ; Hereditary Hemochromatosis.	
12.6	*Iodine,Potassium,Sodium,Chloride,Zinc,Selenium,Fluoride,Manganese,Magnesium : in brief	1Hr
13	HOMEOSTATIC MECHANISMS IN THE BODY	(5Hrs)
13.1	Acid base balance: *Acids, bases, pH, pK, Buffers,HendersonHasselbalch equation	2hrs
13.2	***Body buffers , respiratory & renal regulation of blood pH	
13.3	**Disorders of acid base balance ;	2Hrs
13.5	*Anion gap Assessment of acid base balance by blood gas parameters	
13.6	Fluid and electrolyte balance: *Regulation of osmolality and maintenance of fluids in the various body compartments and related disorders	1Hr
14	MOLECULAR BIOLOGY	(22Hrs)
14.1	*Nucleotide chemistry : Structure of purine &pyrimidine bases, nucleosides, nucleotides	1Hr
14.2	Purine synthesis and catabolism: *Purine synthesis: Synthetic pathway in brief – Source of constituent atoms ,rate limiting steps ,first nucleotide formed and the formation of other nucleotides from IMP	1 Hr
14.3	***Purine catabolism: Pathway ,Hyperuricemia,Gout,Biochemical principles of treatment of Gout ; *LeschNyhansyndrome,Hypouricemia	1 Hr
14.4	*Pyrimidine synthesis and degradation,Oroticaciduria	2Hrs
14.5	*Synthesis of dNTPs (deoxy nucleotide triphosphates) *Nucleotide analogues & Folic acid antagonists	

14.6	**Nucleic acids: Structure and organization of DNA; Different types of DNA, Different types of RNA ,difference between DNA & RNA ;*Mitochondrial DNA	2Hrs
14.7		
14.8	*Cell cycle and ***Replication: Process of replication (prokaryotes); DNA polymerase(prokaryotes & eukaryotes); Inhibitors	2Hrs
14.9		
14.10	**DNA repair mechanisms, Examples of DNA repair defects,*Telomerase	1Hr
14.11	***Transcription: Process of transcription(prokaryotes and differences in eukaryotes); RNA polymerases(prokaryotes & eukaryotes); Inhibitors	2Hr
14.12	**Post transcriptional modifications (hnRNA& primary tRNA transcript) *RNA editing with an example (apo B₄₈&apo B₁₀₀);*Reverse transcriptase ; *Ribozyme	1Hr
14.13	**Genetic code , **t RNA ; *Ribosomes &Polysomes	1Hr
14.14	***Translation: Different phases of translation(eukaryotes differences in prokaryotes);**Post translational modifications; Inhibitors protein targeting	2Hrs
14.15		
14.16	*Regulation of gene expression (lac operon model, gene amplification, gene rearrangement)	2Hrs
14.17		
14.18	DNA based techniques: **Recombinant DNA technology Applications in clinical medicine	1Hr
14.19	**Applications in clinical medicine; Gene therapy ,RFLP ,DNA finger printing	1Hr
14.20	**Blotting techniques (Southern, Northern & Western) ; ** PCR*Antisense therapy	1Hr
14.21	*Biochemical basis of inherited disorders & screening of genetic disorders; Mode of inheritance	1Hr
14.22	***Mutations: Definition ,types with examples ; Mutagens ,Ame's test	1Hr
15	IMMUNOGLOBULINS	(3hrs)
15.1	**Immunoglobulin: Types, Structure (general structure and structure of IgM& IgA);	2Hrs

15.2	&Functions ; *Hypergammaglobulinemia ; * Hypergammaglobulinemia	
15.3	*AIDS (Structure of HIV virus ,major genes & antigens), Natural course of HIV infection Immunology of AIDS, Laboratory diagnosis & monitoring, Biochemical basis of retroviral therapy	1Hr
16	BIOCHEMISTRY OF CANCER	(3Hrs)
16.1	**Biochemistry of cancer: Cell cycle, Cyclins and apoptosis. Etiology of cancer;	2Hrs
16.2	Carcinogenesis: Oncogenic virus; Oncogenes ;Tumor suppressor genes,	
16.3	**Tumor markers ; *Anticancer drugs * Monoclonal antibodies	1Hr
17	CLINICAL BIOCHEMISTRY	(7Hrs)
17.1	**Plasma proteins: Types ; Functions ; Separation ; Abnormal patterns in clinical diseases ; A G ratio; Acute phase proteins	1Hr
17.2	**Electrophoresis of serum proteins ;Multiple myeloma &Bence Jones proteins **Chromatography and diagnosis of inherited disorders of metabolism (Example: Aminoaciduria)	1Hr
17.3	*Colorimetry *ELISA (Principle, Procedure ,Applications),*Radio immune assay (RIA)	1Hr
17.4	** Cardiac markers ***Liver function tests and interpretation	1Hr
17.5	*Thyroid function tests and interpretation	1Hr
17.6	**Renal function tests and interpretation	1Hr
17.7	*Radioactivity :Radioactive isotopes used in Medicine ;Diagnostic, therapeutic and research applications; Radiation hazards	1Hr
18	XENOBIOTICS	(2Hrs)
18.1	**Detoxification and Biotransformation of xenobiotics: Different phases	2Hrs
18.2	*Metabolism of alcohol , brief mention of environmental toxins	
19	FREE RADICALS AND ANTIOXIDANTS	(1Hr)
19.1	Free radicals: Generation, Types, lipid peroxidation. Antioxidants: Different types	

PRACTICAL SYLLABUS [TOTAL: 80Hrs]

QUALITATIVE EXPERIMENTS	
Topics	2 Hr Sessions
Reactions of Carbohydrates : Glucose ,Fructose,Lactose,Sucrose	4 (8hrs)
Proteins : Precipitation of Proteins	1 (2Hrs)
Proteins: Color reactions	1(2Hrs)
Reactions of Albumin	1(2Hrs)
Reactions of Urea,Uric acid &Creatinine	1(2Hrs)
Identification of biologically important substance in given solution	1(2Hrs)
Normal constituents of urine – Inorganic & Organic constituents	2(4Hrs)
Abnormal constituents of urine	2(4Hrs)
Demonstration of electrophoresis of serum proteins & interpretation	1(2Hrs)
Demonstration of paper chromatography/TLC urinary aminoacids& interpretation	1(2Hrs)
Hemin crystal preparation and microscopic examination	1(2Hrs)
QUANTITATIVE EXPERIMENTS	
Introduction to clinical chemistry: Collection of blood samples, Anticoagulants , Collection of 24 hour urine sample and Urine preservatives Principles of colorimetry	1(2Hrs)
Estimations of levels of glucose, urea, creatinine, total protein and albumin in blood	5(10Hrs)
CHART DISCUSSION Clinical cases along with biochemical test results for interpretation and discussion	
Jaundice – Hepatic ,Hemolytic and Obstructive jaundice	1(2Hrs)
Diabetes mellitus - Cases based on diabetes mellitus, Diabetic ketoacidosis, Hyper	1(2Hrs)

osmolar nonketotic coma, Hypoglycemia ,IGT,IFG	
GTT curves – Normoglycemia, Diabetes mellitus, IFG, IGT, Alimentary glycosuria, Renal glycosuria ,Hypoglycemia	1(2Hrs)
Charts based on HbA1C &Micro albuminuria	
Myocardial infarction : Markers	1(2Hrs)
Pancreatitis : Markers	
Prostate Cancer : Markers	
Nephrotic syndrome, Glomerulonephritis	
Charts based on alcoholism, atherosclerosis, lipid profile, fatty liver	1(2Hrs)
Charts based on acid base parameters related to Metabolic acidosis, Metabolic alkalosis, Respiratory acidosis and Respiratory alkalosis (Only uncompensated cases)	
Charts based on TFT related to Hypothyroidism & Hyperthyroidism	1(2Hrs)
Charts based on Metabolic syndrome ,Gout	
Charts based on inborn errors of metabolism (Lactose intolerance , Galactosemia, Fructosuria, vonGierke's disease, PKU, MSU[Hartnup's disease, Alkaptonuria ,Albinism, Pheochromcytoma Carcinoid syndrome, Lesch Nyhan syndrome	
Charts based on Vitamins: Vit A ,D ,K, Thiamine,Niacin,Ascorbicacid,Pyridoxine,Folic acid	1(2Hrs)
Charts based on Minerals: Hypocalcaemia, Hyperkalemia, Hypokalemia, Hyponatremia, Hyponatremia, Fluorosis ,Iron deficiency anaemia, Haemochromatosis, Wilson's disease	
Charts on replication fork, Xeroderma pigmentosum , HNPCC , HIV major genes & antigens	1(2Hrs)

Charts based on enzyme inhibition: Competitive Non competitive, Suicidal inhibition	
OBJECTIVE STRUCTURED PRACTICAL EXAMINATION (OSPE) Practice sessions	2 (4Hrs)
SPOTTERS: Based on tests, instruments, charts, microscopic slides, graphs, nutrition, reference ranges of routine parameters, major concepts, reagents, Indicators.	1 (2Hrs)
Seminars : (Guide lines for evaluation.(Colleges can make their own marking scheme) • Allot 10 topics for a day. • Assign a single topic for a student for presentation lasting for 10 minutes • All the students should learn all the 10 topics. Those who present topic will be evaluated based on the presentation; others will be evaluated either by MCQ based post test or assignments based on the topic presented. (10 MCQs just after the presentation part of the session or assignment submitted within a week) • Marks: 10 marks for presentation & 10 marks for MCQ • Consider 10 % of this mark for internal assessment	7 (12Hrs)

Distribution of marks for practical session

Items	Marks
Qualitative experiment	10 marks. • The questions may be reworded so that the application of the experiment is highlighted. • Question cards may be used to elicit more information <u>Sample questions are provided below which are only for guidance. Colleges can prepare their own question bank.</u>
Quantitative experiment	10 marks The questions may be reworded so that the application of the experiment is highlighted <u>Sample questions are provided below</u>

	<u>which are only for guidance. Colleges can prepare their own question bank</u>
Chart discussion	10marks
Spotters	5 marks -10 spotters – 10x0.5=5 marks
OSPE	5 marks. Two OSPE stations with 2.5 marks each. One performance station and one writing station using suitable question cards. Sample questions and grading sheets provided for guidance only
Record	<i>[Assessment of record keeping should be done along with internal assessment. But <u>submission of record during University Practical Examination is compulsory, to meet the requirement of attending practical examination]</u></i>

Sample questions for QUALITATIVE EXPERIMENT

1. i) Identify whether the sugar solution contains a monosaccharide or disaccharide?

[By doing relevant tests (Benedict's test, Barfoed's test/ Alkali destruction test , it is to be identified and reported).

ii) Related questions (2 or 3 questions may be kept on the seat as a question card) some examples related to the above question are given below

1. Name 2 reducing disaccharides. What are their components?
2. What is the type of linkage between the monosaccharides in these sugars?

3. What is the shape of the osazone?
4. Name a condition where a disaccharide is excreted in urine
5. Name the dietary source for any of these disaccharides
6. Which enzyme can hydrolyze it in the GIT?
7. What will happen if this enzyme is deficient?

Q II.i) Observe the results of these tests and suggest the identity of the sugar. Do you need any other test to confirm the nature of the sugar? If so perform the test and confirm

Q III.i) How will you identify the monosaccharide supplied in the solution? Glucose or fructose

Some questions related to the above question are given below Q II & Q III

1. Give 2 differences between these sugars
2. Name the dietary source
3. Name a disaccharide containing this sugar
4. Name a homopolysaccharide containing this sugar

Q IV. With the help of a test explain the reducing property of glucose

1. What is the clinical use of this test?
2. Is this test specific for glucose?, if not name two non carbohydrate and two carbohydrate substances giving this test positive?
3. Name a test that specifically detects glucose.

Q V. The urine sample from a 6 year old boy gave a positive Benedict's test. Mother complains that the child is losing weight in spite of increased appetite

Identify the sugar (performance of tests)

1. Enumerate the causes of Glycosurias
2. Give two inherited causes of Glycosurias
3. Name a non sugar reducing compound
4. Is there an indication for performing plasma glucose estimation in this patient? If so explain.

Sample questions for QUANTITATIVE EXPERIMENT

Q I. A retired school teacher aged 62 yrs complaining of increased thirst, hunger, passing urine more frequently and losing weight. Urine showed glucose oxidase based strip test positive.

1. What is the blood test required to diagnose diabetes mellitus and Do it & furnish the result. ***[The examiner can discuss the value obtained, method used and possible causes of an abnormal result at the end.]***
2. Give the diagnostic criteria of diabetes mellitus
3. What are IFG and IGT?
4. Name a blood test that reveals mean glucose level over the previous 12 weeks. What is the level of this parameter suggestive of normal glycemic status?
5. Name one test used as a early marker of diabetic nephropathy and retinopathy

Q II. A 5 year old admitted to pediatric ward due to severe diarrhea vomiting and reduced urine output. He is dehydrated. A sample of blood is sent for investigations to assess the renal function.

1. Name two blood test useful to assess renal function
2. Name the analyte which is elevated in dehydration and also in renal disease. Do the estimation of it and submit the report.
3. What is the current Gold standard test to detect renal function

OSPE General Guidelines:

- OSPE questions prepared for experiments should be observable and structured and should be completed within five minutes.

In addition to experiment, the questions kept at the writing station will help to derive the concealed concepts related to the experiment eg: inference /clinical correlations/reference range etc.

A few model OSPE questions are furnished below along with check list for structured observations. A set of common laboratory reagents and lab ware should be arranged at the station. So that students can select the required reagents according to the OSPE questions.

Advantages OSPE:

- practising OSPE questions will sharpen the skills

Sample OSPE questions

1. Glucose solution is provided in a numbered beaker/test tube. Show that it is an aldose by doing one test

Steps	Observations	Marks
1	Selection of a test to show glucose is an aldose : Seliwanoff's test/ Rapid Furfural test	0.5
2	Step-1	0.5
3	Step-2	0.5
4	Write down the observation and inference	0.5
5	Overall performance of the student in terms of choice of proper glassware, Cleanliness , handling of reagent bottles ,accuracy and precision.	0.5

2. Demonstrate the amino acid Tyrosine/Tryptophane, in the given protein solution.
3. Test to distinguish monosachharides from disacharides
4. Test to demonstrate the presence of ketone bodies / bile salts in urine
5. Test to detect the presence of uric acid/creatinine in a solution

Note: Appropriate question cards with a minimum of 3 questions, may be used at the writing station.

MARKS

University examination	Marks
Theory paper I & II (50+50)	100
Theory - Internal assessment	20
Viva	20
Practical	40
Practical - Internal assessment	20
Total	200

SUGGESTED BOOKS IN BIOCHEMISTRY

Books for study:

1. Text of Biochemistry for Medical students by Vasudevan & Sreekumari
2. Harper's review of Biochemistry- latest edition
3. Text of Biochemistry for Medical students R Text of Biochemistry for Medical students Rafi M.D
4. Lippincott's Illustrated Review of Biochemistry -latest edition
5. Practical Biochemistry for Medical students by Vasudevan
6. Practical Biochemistry by Geetha Damodaran K
7. Manual of Practical Biochemistry by S K Gupta, Veena Singh Chalaut & Anju Jain

Books for Reference:

1. Principles of Biochemistry by Lehninger
2. Biochemistry with Clinical Correlations by Thomas. M. Devlin
3. Biochemistry by Stryer
4. Biochemistry-A case oriented Approach by Montgomery

HUMAN PHYSIOLOGY

(I) GOAL

The broad goal of the teaching of undergraduate students in physiology aims in providing the student, a comprehensive knowledge of the normal functions of the organ systems of the body and their interactions to facilitate understanding of the physiological basis of health and changes in disease.

(II) LEARNING

OBJECTIVES A.

Knowledge

At the end, a medical student in Physiology should be able to explain:

- (a) Functions of organ systems in a normal subject.
- (b) Contribution of organ systems and their integration in maintenance of homeostasis
- (c) Altered physiology on exposure to stress, and during disease process
- (d) Compare the normal and abnormal data; interpret the same to assess health status
- (e) Physiological principles underlying pathogenesis and treatment of disease.
- (f) Reproductive physiology as relevant to National Family Welfare programme
- (g) Basic laboratory investigations relevant for a rural set up
- (h) Concept of professionalism
- (i) Approaches to the patient with humanity and compassion

B. Skills

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

- (a) Conduct experiments designed for study of physiological phenomena
- (b) Interpret experimental / investigative data
- (c) 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 shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

(III) DETAILED SYLLABUS

DETAILS OF THE COURSE

Duration of the course: 2 semesters

Total number of hours: 480

Lectures: 160

Practical: 120

Innovative session (Projects, seminars, structured discussion, integrated teaching, formative evaluation and revision: 200

DETAILS OF CLASSES IN PHYSIOLOGY

GENERAL PHYSIOLOGY

3 hrs

Introduction to Physiology, Principles of Homeostasis, Transport Mechanism, Intercellular communication. Body fluid compartments- divisions, composition, & determination (mention Fick's Principle) Blood volume-normal value, abnormalities- Hypervolemia & Hypovolemia.

HEMATOLOGY

21 hrs

Introduction

1hr

Blood - Functions, composition, Properties – specific gravity, viscosity – definition, normal values & variations

Plasma proteins:

1hr

Types, Quantity, Functions, AG ratio- Importance to be given for functions - Abnormal proteins to be dealt in biochemistry

Red Blood Cells

1hr

Morphology, composition and functions, normal RBC count and variations----- Properties – to be dealt in practical's

Haemoglobin

1hr

outline only normal basic structure, normal content, functions, types (Hb A, Hb A2 and Hb

F) abnormal Hbs (only two - Thalassemias & Haemoglobin S – mention only details in Biochemistry)

Erythropoiesis

1hr

Sites (intra and extra uterine) different stages, Factors influencing & regulating Erythropoiesis Life Span of RBC and its destruction (outline), jaundice (mention – details in Biochemistry).

Anaemias

1hr

definition, classifications (etiological, morphological), physiological basis of anaemias (briefly), iron deficiency anaemia, Pernicious anaemia, aplastic anaemia, Hemolytic anaemia (briefly), Polycythemia- primary and secondary

White Blood Cells:

4hrs

Classification, morphology (details in practical classes), lifespan Properties and functions – Neutrophil, Eosinophil, Basophil, Monocyte, Lymphocyte. Normal total and differential count (methods in practicals), variations Leucocytosis, Leucopenia, leukaemia (definition, mention difference from leucocytosis), agranulocytosis

Immunity

1hr

Definition, Types – innate and acquired, Humoral and cellular Mechanisms of immune response, plasma cell, immunoglobins, autoimmune disorders, AIDS (mention).

Reticulo endothelial system

½hrs

Platelets:

1 hr

Morphology, properties and functions, normal count, variations, thrombopoiesis, and factors influencing this

Haemostasis

4 hrs

Primary (vasospasm, platelet plug formation) and Secondary (extrinsic and intrinsic mechanisms of coagulation of blood) Clot retraction (mention)

Anticlotting mechanisms in vivo -factors that limit clot formation (Protein C, Protein S and antithrombin III) and fibrinolytic system (all in brief).

Anticoagulants – used in lab and in vivo. Bleeding disorders Purpura, Hemophilia, Vitamin K deficiency Tests for bleeding disorders – bleeding time, clotting time (in practicals).

Prothrombin time and PTT (principles only) Thrombosis and Embolism – mention

Blood volume - Normal volume, abnormalities, hypervolemia & hypovolemia (mention)

Blood groups

2 hrs

ABO and Rh systems, inheritance, differences, Bombay group, Landsteiner's laws I and II Mention about Bombay blood group, no need of other minor blood groups

Blood grouping and cross matching (importance), concept of universal donor and recipient

ABO and Rh incompatibility – important manifestations, erythroblastosis foetalis.

Management and preventive measures, Medicolegal and clinical importance (briefly)

Blood banking and transfusion

1 ½hrs

Blood transfusion – indications, precautions and complications

Blood Banking –anticoagulants used, storage, changes during storage – Lymph –**1 hr**

formation, circulation, functions

Tissue fluid – formation, circulation and functions Starling's hypothesis – edema formation **2 hrs**

Seminars/tutorials

INTEGRATED TEACHING

6 hrs

1.Pathology dept

Anaemia blood smear –Normal and abnormal -1hour

2. Transfusion medicine department

Transfusion of blood components – with special reference to recent advances, Modern trends in blood banking -1 hour

2. Microbiology department

Immune mechanisms -1hour

CARDIOVASCULAR SYSTEM

LECTURES 26 hrs

Functional anatomy of heart and blood vessels Chambers, valves, great vessels, Systemic

and pulmonary circulations Properties of cardiac muscle, Excitability, rhythmicity, conductivity, contractility, to review only as it is dealt in NMP

1hr

Conducting system of heart, parts of conducting system, origin and spread of cardiac

1hr

impulse, abnormal pacemakers, conduction defects

Cardiac cycle:

5hrs

Definition, phases, events of cardiac cycle Pressure changes – Atria, Jugular vein (mention clinical significance). Ventricles – right and left, Aorta and Pulmonary artery, Volume changes – in different chambers. Heart sounds – causes, character, murmur (definition, physiological basis)

Arterial Pulse - genesis and characters of normal pulse

Common abnormalities– to be dealt in practical classes

Venous blood flow-Venous tone, valves

ECG

2hrs

Definition, Principles of recording of ECG (details in practical) Leads – unipolar and bipolar, commonly used 12 Leads, Normal tracing in Lead II – normal waves, intervals and segments, how HR is determined, correlation with action potential and phases of cardiac cycle,

Correlation between different events of cardiac cycle – (diagrammatic representation)

Clinical uses of ECG – (mention).

(Abnormal ECG pattern in myocardial infarction, cardiac arrhythmias . Effect of changes in ECF K⁺, Ca⁺⁺ and Na⁺ conduction defects to be dealt in practical)

Cardiac output:

5 hrs

Definition, normal values, variations Fick's principle – mention (Methods & other methods of measurement details not required) . Regulation of cardiac output – heart rate - Regulation of heart rate, stroke volume – determinants, regulation

Hemodynamics:

2hrs

General principles including physical laws governing flow of blood in heart and blood vessels not in detail)-Pressure – resistance - flow relationship, Poiseuille-Hagen formulae, law of Laplace Laminar flow, turbulent flow, Reynold's number, critical closing volume Importance of peripheral resistance, venous circulation, venous tone to be dealt with blood pressure. Regulation of blood flow

Structure & function of different segments of blood vessels. Correlate with function, local regulation including autoregulation of blood flow, vasoconstrictors and vasodilators, substances secreted by endothelium.

Arterial Blood pressure:

3hrs

Systolic and diastolic pressures– definition, normal values, variations Define end pressure and lateral pressure, Bernoulli's principle (mention) Pulse pressure, Mean arterial pressure

- definition, normal values Determinants of Systolic and diastolic pressures Measurement– details in practical class

Regulation - neural and humoral.(short term, intermediate and long term)

Cardiovascular reflexes, Local regulation including auto regulation of blood flow, vasoconstrictors and vasodilators, substances secreted by endothelium (important ones)

Effects of gravity, Posture and Exercise on B.P Hypertension & hypotension in practicals

Regional circulation:

3hrs

Coronary, cerebral, capillary, cutaneous, splanchnic circulation

Fetal, pulmonary, renal to be taught in respective system

Circulatory shock 1hr

Types pathophysiology, stages, compensatory mechanisms

Cardio-vascular & Respiratory adjustments in health 1hr

–effect of gravity (+ve and –ve),
weightlessness (brief)

Effect of exercise 2hrs

To be dealt after both Respiratory & CVS is over -Refer Respiratory system

Seminar/Tutorials 2hrs

Integrated teaching 2hrs

ECHO, Abnormal ECG and Cardiac catheterization

RESPIRATORY SYSTEM LECTURES 16hrs

Introduction 1hr

Define respiration ,Organisation and functional anatomy of respiratory system
Tracheobronchial tree, Respiratory unit, Alveoli (structure and functions), Pleura, pleural fluid Functions of different parts of respiratory system including non-respiratory functions

Mechanics of respiration: 2hrs

Inspiration and expiration, muscles of inspiration and expiration and their actions, Pump handle and bucket handle movements, expansion of thorax and lungs, Types of breathing Pressure changes during normal respiratory cycle – intra (alveolar) pulmonary and intra thoracic (alveolar) pressure changes, development of negative intra thoracic pressure

Surfactant – functions (surface tension, alveolar stability, alveoli kept dry, interdependence of alveoli), hyaline membrane disease, ARDS Law of laplace – application

Measurement of pulmonary ventilation 2hrs

Spirometry in practicals

Lung volumes (mention) static & dynamic lung volumes TV, IRV, ERV, RV, VC TLC, FEV, FRC

– Residual volume (measurement not needed) RMV, MVV, breathing reserve, closing volume (mention) to be dealt with practicals Ventilation – pulmonary and alveolar Dead space – Anatomical & Physiological- definition, normal values, variations (1-2 eg) (Measurement not needed)

Pressure – volume relationship -**1 hr**

Elastic behaviour of lungs, total and lung compliance – normal values Airway resistance, work of breathing (brief outline –it is to overcome elastic, nonelastic and airway resistance), factors affecting bronchial tone, 1-2 conditions where work of breathing is increased

Pulmonary blood flow: -**1 hr**

Volume, pressure, factors influencing – nervous and chemical factors, unique features. Variations in regional pulmonary blood flow, ventilation – perfusion ratio and its importance

Pulmonary exchange of gas & Mechanism -**2hrs**

Composition of inspired air, expired air, partial pressures gas composition of Arterial & venous blood,. Structure of blood gas barrier, factors affecting diffusion across respiratory Membrane diffusion capacity for O₂ & CO₂, O₂ transport in blood, oxygenation of Hb, O₂ carrying capacity, O₂ content, % saturation, coefficient of O₂ utilization, Properties of Hb that facilitates O₂ transport O₂ dissociation curve, factors shifting curve to right and left, P50 foetal Hb, Myoglobin, carboxy Hb–

CO₂ transport in blood**1 hr**

Different forms of transport, chemical reactions involved, changes occurring in lungs Haldane and Bohr effect -

Regulation of respiration:**3 hrs**

Neural control – neural centers, genesis of respiratory rhythmicity, ramp signal (experimental evidence not required), Voluntary control, Reflex control Breath holding and braking point. Chemical control – stimuli, chemoreceptors (peripheral and central), ventilatory response to hypercapnea, hypoxia and change in H⁺ ion concentration.

Hypoxia:**- 1hr**

Definition, types, clinical features, Oxygen therapy - Cyanosis, asphyxia and dyspnea, Definition, CO poisoning (mention), Periodic breathing Cheyne – stokes and biots breathing, voluntary hyperventilation

Environmental Physiology:**1hr**

High altitude, rapid ascent, Mountain sickness, Acclimatization Effects of UV rays, Dysbarism

Effects of increased barometric pressure	1hr
Seminar/Tutorials	4hrs
Nitrogen narcosis, High pressure nervous syndrome, Oxygen toxicity Decompression sickness (Caissons disease) Cardiovascular & Respiratory changes during exercise - Space physiology ,effect of "G" forces on respiratory system	
INTEGRATED TEACHING	4hrs
Artificial respiration(delete Holger Neilson method) CPR with Mannequien Pulmonary function tests to be dealt in practicals & include in record .	
GASTROINTESTINAL SYSTEM	
	LECTURES -12
Introduction to G.I. Physiology :	1 hr
General organization of G.I. tract Neural control of G.I function Enteric nervous system, Autonomic control Mechanism of enzyme secretion by glands in general.	
Salivary Gland:- Saliva composition, function, control of secretion. Conditioned and unconditioned reflexes disturbances in salivary secretion-in anxiety and dehydration	1 hr
Gastric Secretion:- Gastric juice: Composition, functions. gastric HCL secretion-mechanism and regulation of secretion. Gastric juice-functions, phases of secretion and regulation. Gastrin-functions and regulation of secretion. Mucosal barrier, pathophysiology of peptic ulcer in brief	3 hrs
Pancreas , Liver and gall bladder	2 hrs
Exocrine Pancreas; Pancreatic juice: Composition, function, and regulation of secretion (neural and humoral – CCK and secretin)-applied importance (mention steatorrhoea) . - Functions of Liver, Composition and functions of bile, control of secretion Functions of gall bladder, filling and emptying of gall bladder Enterohepatic circulation, Jaundice – prehepatic, hepatic and post hepatic in brief	
Small intestine.	1hr
Composition, regulation of secretion, and functions of intestinal juice Small intestine Functions-	
Large intestine	1 hr
Functions – secretory, motor, absorptive, synthesis of short chain fatty acids.	
Movements of G.I. tract. -	1hr
Movements to be taught in respective segments of GIT Electrophysiology of smooth muscle in the GIT (revise) – BER, MMC. Peristalsis – definition, basis, functions. Mastication – definition, muscles involved, functions Deglutition – definition, muscles involved, stages functions & abnormalities	1hr
Gastric motility – types, regulation, abnormal movements Gastric emptying –duration, factors affecting vomiting.	1hr
Movements of small intestine& Large intestine- Types with reference to BER mixing, pendular, movements of villi and peristalsis.	
Defecation reflex, Diarrhoea, Role of dietary fibre, bacterial flora	1hr

Seminar/tutorials	4hrs
Gastro intestinal hormones	
Assignment	4hrs
(Gastrin, CCK-PZ, Secretin, Villikinin, VIP, GIP)	
INTEGRATED TEACHING	2hrs
Liver and biliary system (depts of physiology, anatomy, biochemistry and internal medicine)	
RENAL SYSTEM	LECTURES 10 hrs
Introduction-	1hr
Functions of kidney – homeostasis, as an endocrine organ Functional anatomy of Kidney Nephron-structure, parts, function, types (in detail)	
Renal circulation - Normal flow, regulation, peculiarities, and principle of measurement – Juxtaglomerular apparatus. Site, structure, function.	
Glomerular filtration:	2hrs
Definition, rate, filtration membrane, forces governing filtration and permeability of the membrane, measurement of GFR Clearance values – definition, values for glucose, insulin, and urea	
Tubular functions:	1 hr
Tubular reabsorption – define Sodium, glucose, water, urea, electrolytes - sites, mechanisms involved Tubular maximum, Glomerulo tubular feedback, and Renal threshold ,Water - reabsorption in different segments – obligatory and facultative Tubular secretion – H ⁺ (acidification), K ⁺ Filtered load, -	
Acidification of urine & Role of kidney in acid base balance	1hr
Mechanisms and sites of H ⁺ secretion, pH changes along renal tubules, fate of H ⁺ in the renal tubule (buffer systems), non-ionic diffusion. –	
Concentration of urine	2hrs
Counter current system – multiplier, exchanger Cortico medullary gradient – factors maintaining (ADH, permeability characteristics of renal tubule, role of urea and vasa recta) Osmotic gradient along renal tubules Diuresis – definition, osmotic and pressure diuresis	
Micturition:	2 hrs

Functional anatomy of bladder -muscles and sphincters and innervation of bladder, Filling and emptying of bladder, Cystometrogram Micturition reflex and its higher control, voluntary control Abnormalities of micturition – deafferented, decentralised and automatic bladder –

Urine –Normal volume, constituents abnormal --dealt in biochemistry

Mention polyuria,oliguria,anuria

1hr

Basic principles of haemo & peritoneal dialysis –Artificial kidney

RFT dealt in biochemistry

Seminar /Tutorials

6hrs

SKIN AND TEMPERATURE REGULATION

2 hrs

Functions of skin, Methods of heat conservation and loss in human body

Regulation of body temperature – role of skin, hypothalamus Hyperthermia, Fever, hypothermia

NERVE MUSCLE PHYSIOLOGY

11hrs

Excitable tissue

1hr

Definition, properties. Neuron. Structure of a typical neuron, types, properties, functions. Stimulus. Definition, types – threshold, subthreshold, suprathreshold -

Nerve fibers Types, classification, and functions

Resting membrane potential.

1hr

Definition, ionic basis and genesis -

Nerve action potential. -

Definition, ionic basis and properties, Monophasic action potential

1hr

Transmission of nerve impulses. -

1hr

Types (myelinated and unmyelinated), differences in impulse transmission. Velocity of conduction and factors affecting it

Peripheral nerve injury.

1hr

Wallerian degeneration, regeneration, denervation hypersensitivity

Neuromuscular junction.

1hr

Functional anatomy, transmission of impulses across neuromuscular junction, EPP.

Neuromuscular blocking drugs (important ones with clinical correlation).

Pathophysiology of Myasthenia Gravis

Muscles:**2hrs**

Classification. Skeletal muscle Structure including molecular details, properties. Action potential - Definition, ionic basis and properties, Comparison with nerve action potential Molecular basis of muscle contraction - Excitation – contraction coupling. Types of muscle contraction – isotonic and isometric with examples. Muscle types – fast and slow, differences. Fasciculation, fibrillation (briefly) --

Cardiac muscle:**2hrs**

Structure, properties. Action potential- Definition, ionic basis and properties, Comparison with nerve and muscle action potential. Pacemaker potential - molecular basis, properties -

Smooth muscle:**1 hr**

Types, Structure, innervation and neuromuscular junction. Plasticity (cystometrogram to explain). –

Seminar/tutorials**Comparison of structure & function of three types of muscle****INTEGRATED TEACHING in Practicals****1hr****EMG****NERVOUS SYSTEM****LECTURES -38 hrs****Organization of nervous system:****2hrs**

General organization Functional anatomy of brain and spinal cord, Coverings, white and grey mater – review briefly. Brain – lobes, functions, Brodmann's areas –important ones with functions Neuron, neuroglia – functions Spinal cord – Functional anatomy -coverings, structure, white and grey mater Cross section with location of sensory, motor and autonomic neurons and tracts.

CSF:**2hrs**

Formation, circulation, composition and functions –Lumbar puncture. Blood brain barrier

Synapse:**3hrs**

Types. Functional anatomy of typical chemical synapse and synaptic transmission. Synaptic potentials – EPSP, IPSP –ionic basis and comparison with action potential. Properties of synapses (one way conduction, synaptic delay, synaptic inhibition, convergence, divergence, summation, fatigue, after discharge and synaptic plasticity).

Synaptic inhibition –types, mechanisms. Neurotransmitters – facilitatory and inhibitory with 2-3 eg and clinical applications Factors affecting signal transmission -

1hr

Reflex action.& Sensory receptors

Definition, reflex arc - components Classification with examples -Mono and polysynaptic, Somatic and visceral, Superficial and deep with mention of examples (details of reflexes in motor system)

Sensory receptors. Classification (recent view), types (phasic and tonic), properties - adaptation Receptor potential, comparison with action potential.

Sensory tracts -

3hrs

Organisation of sensory pathways. Name all ascending pathways of spinal cord. Tracing of pathways from body and face. Medial lemniscal system – dorsal column sensations. Spino thalamic system. Sensation of touch and pressure. Sensation of pain and temperature. Synthetic sensation. Other ascending tracts – salient features- spinoreticular, spinocerebellar

Pain –

1hr

Different types of pain. Slow and fast pain – types of fibres, tracts and terminations. Modulation of pain - Spinal level, supra spinal level. Visceral pain, referred pain, radiating pain, - clinical correlates. Altered pain sensations Thalamus: connections in relation to function only, Functions of thalamus Thalamic syndrome –

Pain pathway – across the DRGanglion, ST Tracts, Thalamus, PAGrey Matter, Cortex, etc. Links with emotional centre. Pain appraisal – primary and secondary, subjectivity of pain experience.

3hrs

Sensory Cortex, Motor cortex & Cerebral Cortex

(not to be asked in exam)

1hr

Location – primary area, secondary area, association areas. Salient histological features. Body representation -sensory homunculus. Functions of primary, secondary and association areas. : Brodmann's areas- Lesions -

Motor system –

2hrs

Introduction, levels of motor control, review cross section of spinal cord.

Review cross section of spinal cord – various ascending and descending Pathways Stretch reflex – details and function Inverse stretch reflex, Reciprocal innervation, Other poly synaptic reflexes Pathological – Babinski sign

Descending tracts.

3hrs

Muscle spindle Structure -function-regulation

General organisation, Pyramidal and extra pyramidal tracts, their functions. Mention as medial and lateral systems, Upper motor neurons and lower motor neurons. Upper motor neuron and lower motor neuron lesions – differences Effects of lesions at various levels - hemiplegia, paraplegia, monoplegia

Cross section of spinal cord & Injuries of spinal cord

2hrs

- complete transection, incomplete transection, hemisection, section of anterior and posterior roots, injury to motor nerve

Basal ganglia –

2hrs

Organisation. Neuronal masses & Connections (brief). Functions. Disorders – Parkinsonism with explanation of the Physiological basis of the signs and symptoms. Wilson's disease – mention

Cerebellum-

2hrs

Evolutional divisions & functions. Deep cerebellar nuclei, connections in relation to functions, Neuronal circuit (mention). Cerebellar lesion – features and their physiological basis -

Reticular formation:

1hr

ARAS, descending reticular system –explain control of muscle tone

EEG and sleep.-

1hr

Define EEG, principle of recording, Normal waves (á, â, ä and è), alpha block, Clinical uses

Sleep-Genesis, types,& stages of sleep-Differences between REM & NREM sleep

Limbic system & Prefrontal lobe

1hr

Organisation, connections (mention important ones) and functions -1hr

Vestibular apparatus:

2hrs

Functional anatomy - gross structure, receptors, receptor potential Functions & abnormalities-

Muscle tone, posture, equilibrium.

1hr

Basis of maintenance – stretch reflex, higher control, Postural reflexes – mention with levels of integration (details not required). Regulation of muscle tone and posture (righting reflexes not included) -

Hypothalamus

1hr

Functional anatomy, Nuclei & functions

Higher functions of the brain:

2hrs

Conditioned reflex ,Learning - Memory – types& basis
Speech – Types, Mechanisms of speech, Aphasia – types –
Autonomic nervous system:

2hrs

Organization and functions

SEMINAR / TUTORIAL -

8hrs

Autonomic nervous system, hypothalamus, Limbic system, cross section of Spinal cord, CSF

SPECIAL SENSES

LECTURES – 16 ½ hrs

Olfaction

1hr

Receptor, pathway, lesions – anosmia, parosmia -

Taste:

1hr

Taste buds, receptor, primary taste sensations, pathway -

Vision:

10 ½hrs

Introduction. Functional anatomy of eye –

Review. Chambers of the eye, intraocular fluids - aqueous humor, vitreous humor.

Lens - characteristics, changes with age, aphakia, cataract. Retina – Histology to be reviewed, Macula lutea, fovea centralis – Explain - 1^{1/2} hr

Basic optics. -2hrs

Optical system of the eye. Refractive media of eye -Refracting surfaces & refractive indices. Concepts of reduced eye, Image formation on retina. Emmetropic eye. Far and near points Errors of refraction – chromatic and spherical aberrations, hypermetropia, myopia, and Astigmatism presbyopia, – causes (brief) features and corrective lenses. Contact lenses (mention)

Visual receptors, adaptation, Muscles of eye - 3hrs

(cones and rods). Structure in detail. Visual pigments, role of vitamin A. Phototransduction.(only nueral signaling) Adaptations of visual receptors -Dark adaptation and light adaptation. Electrophysiology of receptors, receptor potential, lateral inhibition. Electroretinogram (mention) Duplicity theory of vision, photopic and scotopic vision – Muscles of eye- Names, nerve supply and movements of eyeball Corresponding points, double vision and squint (mention)Color vision

Primary, secondary and complementary colors (mention). Hue, brightness and saturation (mention).Trichromatic and Opponent Process Theories. Color blobs – location and function. Color blindness. Afterimages, contrasts -

Visual Pathways. 2hrs

Monoocular and binocular vision. Visual signals -Processing in the Retina. Effects of lesion at different levels. Macular sparing (recent views) Visual cortex – all areas and functions

Visual reflexes. Pupillary light reflex (direct and indirect) - pathway, lesion, Miosis & mydriasis (mention).

Accommodation and accommodation reflex (Near response) –3 components - Pupillary constriction, convergence of eye balls, and increased anterior curvature of lens.. –

Accommodation reflex – pathways, lesions. -

2hrs

Tests of Vision -Field of vision, Visual acuity, Color vision – definition, details of tests in practicals

AUDITION

4hrs

Acoustics – frequency, amplitude of sound, pitch, intensity, and quality of sound.

Functional anatomy of the ear. Functions of external, middle and inner ear - **1hr**

Cochlea – structure, Organ of corti. Hair cell physiology- receptor potential. Mechano-electrical transduction by hair cells. Endocochlear potential. Discrimination of pitch (travelling wave theory) and intensity of sound -

2hr

Auditory pathway. Sound localization, pitch discrimination, masking of sounds. Deafness (conduction and nerve deafness) –

1hr

Audiometry (details in practicals) -

1hr

LECTURES -20 hrs

ENDOCRINOLOGY

General endocrinology& Hypothalamus

-3hrs

Names and organisation of Endocrine glands in human body Hormone – definition, and classification – on chemical nature. General hormones and local hormones – autocrine, paracrine and endocrine.hormones. Mechanism of action of hormones. Hormone receptors – cell membrane and intracellular, Mechanism of action via the different receptors – basics with 2 examples, Second messenger system –brief. Control of secretion of hormones in general – the + ve and –ve feed back with 2 examples. Abnormalities of hormone function – decrease, increase, receptor dysfunction, abnormal hormones or antibodies to be dealt with individual glands

Hypothalamus Functional anatomy, Hormones (Releasing and inhibiting), their physiological actions Interrelationship between hypothalamus and pituitary glands – Infundibulum -hypothalamo –pituitary tract and portal system.

Pituitary gland**4 hrs**

Hormones of anterior and posterior pituitary. Growth hormone - physiological actions and regulation of secretion in detail. Hyper and hypofunction – Acromegaly, Gigantism and Dwarfism. Other hormones to be dealt with the target glands, Mention intermediate lobe hormones - pro opiomelanocortin and MSH -

Thyroid gland:**4hrs**

Hormones- names, biosynthesis (details in biochemistry), transport, physiological actions and regulation of secretion (H-P-T axis). Thyroid function tests (details in biochemistry). Hyper and hypofunction in children and adults – Cretinism, Myxedema, Hyperthyroidism -

Pancreas – Endocrine.**2hrs**

Hormones- physiological actions and regulation of secretion. Insulin - receptors and insulin resistance (mention) Physiological actions Regulation of secretion Hyper and hypofunction

– diabetes mellitus and hypoglycemia. Glucagon – physiologic actions on carbohydrate, proteins and fat metabolism, on heart. Regulation of secretion. Somatostatin – site of production, actions, stimuli for secretion, paracrine regulations. Pancreatic polypeptide – site of secretion, factors which increase secretion, action

Adrenal gland:**4hrs**

Adrenal Cortex: 3hrs

3 layers (briefly) Biosynthesis of adrenal cortical hormones (details in biochemistry). Hormones of adrenal cortex - glucocorticoids, mineralocorticoids, sex steroids. Transport, physiological actions and regulation of secretion glucocorticoids - metabolic, permissive, anti inflammatory, anti allergic and in stress. Regulation of secretion – H-P-A axis mineralocorticoids – role in salt and water balance, stress. Regulation of secretion – effects of K⁺, Na⁺, ACTH Hyper and hypofunction – Cushing's syndrome. Primary and secondary hyperaldosteronism, Addison's disease –

Adrenal medulla: Hormones (catecholamine), regulation of secretion, Pheochromocytoma -1hr

Calcium homeostasis**-2hrs**

Normal calcium metabolism (outline). Parathyroid hormone, calcitonin and vitamin D - target organs and physiological actions. Hypocalcemia and tetany -

Other endocrine glands & Local Hormones-**1hr**

Physiological actions and regulation of secretion – Kidney, Pineal body (retino

hypothalamic tract – very brief). Thymus, Heart, Local hormones, Histamine, Sub P, bradykinin, serotonin, prostaglandins, Sources and physiological actions -

SEMINARS / TUTORIALS -

Physiology of growth and development. Correlation of actions of different hormones from childhood, puberty and adulthood (briefly) -**1hr**

PHYSIOLOGY OF REPRODUCTION

LECTURES -11hrs

Introduction

1hr

Briefly on hormonal factors influencing development of genitalia. Developmental abnormalities-(adrenogenital, hermaphroditism). Puberty – normal, precocious and delayed puberty -

Male reproductive system.

2hrs

Functions of testis – endocrine -testosterone (functions and regulation of secretion) - Factors influencing Spermatogenesis and regulating it. Abnormalities of testicular function

- cryptorchidism, male hypogonadism (mention) Erection, ejaculation, composition of semen, sterility -

Female reproductive system:

2hrs

Ovarian hormones- estrogens, progesterone, relaxin. Control of ovarian functions by H- P-Gonadal axis. Pituitary gonadotropins (FSH, LH), Prolactin – physiologic actions, regulation of secretion

Menstrual cycle:

2hrs

Menstrual, proliferative and secretory phases. Ovarian, uterine and vaginal changes during menstrual cycle. Hormonal regulation. Abnormalities of ovarian function - anovulatory cycle, infertility. Menarche, menopause. Castration before and after puberty -

Pregnancy & Lactation –

3hrs

Corpus luteum of pregnancy. Placenta – functions, Placental hormones. Foetoplacental unit. Parturition – physiology of labour. Lactation Mention Neuroendocrine reflex in Parturition & Lactation Pregnancy tests – immunological (currently done). Hormones influencing and their actions -

Contraception:

1hr

Temporary and permanent methods in males and females, and their physiological basis -

INTEGRATED TEACHING -

1hr

Induction of ovulation, in vitro fertilization, Infertility (with O &G dept)

DETAILS OF PRACTICALS

Human Physiology

-76hr

1. Use and care of microscope and microscopic examination of blood
2. PCV, ESR, osmotic fragility
3. Haemoglobin estimation and blood indices
4. RBC count
5. WBC count
6. Examination of peripheral blood smear
7. Differential WBC count – normal, abnormal, anaemias
8. ABO grouping, Rh typing
9. Bleeding time, clotting time
10. Recording of BP – effects of posture and exercise
11. Recording of arterial pulse only
12. Respiratory movements demonstration
13. General examination
14. Examination of Respiratory system
15. Examination of CVS
16. Examination of higher functions and sensory system
17. Examination of Motor system
18. Examination reflexes
19. Examination of cranial nerves 1-6
20. Examination of cranial nerves 7-12
21. Revisions as required

Experimental physiology (Demonstration through e-modules / recorded graphs)

-28hr

1. Appliances in experimental physiology Laboratory including physiograph
2. Pithing, muscle nerve preparation, mounting, effects of different types of stimuli
3. Simple muscle twitch
4. Two successive stimuli, repetitive stimuli and fatigue
5. Genesis of tetanus and Starling's law of muscle
6. Effect of load and after load on muscle contraction
7. Effects of variations of temperature on muscle contraction
8. Velocity of nerve impulse
9. Normal cardiogram of frog's heart and effects of heat and cold.
10. Effect of temperature on frog's heart
11. Refractory period of frog's heart
12. Stannius ligatures. Properties of cardiac muscle – all or none law, treppe, summation of subminimal stimuli
13. Effect of vagal stimulation on frog's heart
14. Perfusion of frog's heart – action of ions, action of drugs

Demonstration Only

Electro encephalogram (EEG), Electro miogram (EMG),
Electro Cardio Gram (ECG), Audiometry, Perimetry,
Spirometry

Recommended Text Books

1. Text book of Physiology by Arthur C Guyton-13th edition
2. Review of Medical Physiology by Ganong.-24th edition
3. Text book of Physiology by G.K.Pal
4. Text book of Physiology by A.K.Jain (2volumes)

Reference Books

1. Text book of Human Physiology. Madhavan Kutty, Sarada Subramaniam, HD Sing, S. Chand and Company
2. Wintrobe's Hematology
3. Williams text book of Endocrinology
4. Snell's neuroanatomy
5. Samson Wright's applied physiology
6. Best and Taylor's Physiological Basis of Medical Practice
7. Understanding Medical Physiology.R.I. Bajalani Jaypee Publishers
8. Best and Taylor's basis of Medical Practice by J B West-William and Walkins

EVALUATION

M.C.I. Guidelines

1. Problem solving exercises

2. OSPE (Objective Structured Practical Examination)
3. Viva Voce – with practicals

Pattern of questions in Theory paper

Paper 1: Blood, CVS, Respiration, Renal , Environmental Physiology, Digestion, Regulation of Temperature,

Paper II: General Physiology, CNS, Special senses, Muscle and Nerve, Endocrinology, Reproduction, Growth and development,

- Structured Essay (preferably case scenario) - 1 no.(10 marks)
- Short questions- 2 nos. (5marks x 2 =10 marks)
- Write briefly on-5 nos. (3 marks x 5 = 15 marks)
- Draw labelled diagrams-2 nos. (2 ½ marks x 2 =5)
- Physiological basis/Give reasons- 5 nos. (2 marks x 5 =10)

Physiology Practical Exam

- Max marks - 40(university) +20 (Internal)= 60 marks
 - Practical - I (20 marks)
 - Spotters -10 marks
 - Amphibian graph – 5 marks
 - Short hematology – 5 marks
 - Practical - II (20 marks)
 - Clinical Exam -10 marks
 - Long hematology (any one of the following - RBC count / WBC count / Peripheral Smear) -10 marks

Mark distribution

- Theory : (Total-140 marks)
 - Theory Paper I + II = (50 + 50) =100 marks(University)
 - Viva- 20 marks
 - Internal asessment- 20 marks

Practicals : (Total-60 marks)

- Practicals I & II-(20+20) =40 marks(University)
- Internal assessment - 20 marks
- Aggregate : 200 marks
- Internal Assessment

Based on day to day performance assessed by daily evaluation, short examinations, tutorials, seminars, sessional examinations etc.

Theory – Pattern of Question paper - Two papers of three hours duration (50 marks each)

OBJECTIVE STRUCTURED PRACTICAL EXAMINATION (OSPE)

SPOTTERS : 10 Numbers-Based on calculations, ,instruments,charts, microscopic slides of blood cells, graphs,(including graphs from systems,amphibian expts-skeletal muscle/cardiac muscle) clinical history,clinical skill)

Seminars :

Guide lines:

- Allot 8 topics for a day.
- Assign a single topic per student for presentation that lasts 10 minutes
- All the students should learn all the 8 topics to participate in the post test session (10 questions) after the presentation session
- Marks: 10 marks for presentation & 10 marks for post test
- Consider 10 % of this mark for internal assessment

List of Assignment topics and Seminar topics can be prepared by the department. Records should be maintained with marks assigned during internal assessment

FORENSIC MEDICINE AND TOXICOLOGY

GOAL

The broad goal of the teaching of undergraduate students in Forensic medicine is to produce a physician who is well informed about medico legal responsibilities in practice of medicine. He/she acquire knowledge of law in relation to medical practice, medical negligence and respect for codes of medical ethics.

Learning objectives-

1. Be conversant with medical ethics, etiquette, duties rights and legal

responsibilities of the physician towards patients, profession, society, state and humanity at large and implications of medical negligence.

2. Be aware of relevant existing laws and procedures including the recent developments applicable to medical practice.
3. Identify, examine, document and prepare report/certificate in medico legal cases/situations in accordance with the law of the land.
4. Recognize and manage common medico legal problems including cases of poisoning in conformity with the medical procedure.
5. Perform medico legal postmortem examination and interpret the findings and results of other relevant investigations to logically conclude the cause, manner and time since death.
6. Preserve and dispatch specimens in medico legal/postmortem cases and other concerned materials to the appropriate government agencies for necessary examination.
7. Be aware of the general principles of environmental, occupational and preventive aspects of toxicology.

Period of study	-	III, IV and V Semester.
Duration of training	-	18 months.
Methods of instructions	-	
Lecture	-	30 hrs.
Practicals and Innovative sessions		70 hrs.
Total no of hours	-	100Hrs.

	TOPIC	Method of teaching	Hours
	Forensic medicine	Lecture	1
1	Definition of forensic medicine, Forensic pathology and medical jurisprudence		
2	Introduction to the subject, historical aspects of forensic medicine.		
3	Inquest procedures	Lecture	3

4	Courts in India and their powers. Supreme court, High court, Sessions court, Assistant sessions court and Magistrate courts.	Innovative session (Moot court) Practical	2
5	Court procedures. Summons, warrant, Conduct money, Oath/affirmation, Types of witnesses, Recording of evidence, Conduct of doctor in witness box, Perjury, Hostile witness.		2
6	Medical certificates and Medico legal reports. Birth, death, wound, drunkenness, potency, Sexual offence cases, intimation, notification.	Lecture	1
7	Death and Causes	Lecture	4
8	Definition, diagnosis and certification (as per MCCD rules), somatic, molecular and brain death. Sudden natural deaths, suspended animation.Changes after death. A) Algor mortis, Livor mortis, Rigor mortis, cadaveric spasm, cold stiffening, heat stiffening.	Practical demo.	4

	B) Decomposition, modified forms of decomposition, estimation of time since death. C) Common post mortem artifacts.		
	Identification	Lecture	1
	A Definition. B) Identification of persons, dead bodies and remains of a person by sex, age, biometry, dental features, scars, moles, tattoos, dactylography, personal belongings photography, super imposition, DNA.	Practical demo. Group discussion	2 2
10	Medico legal autopsy and exhumation.	Lecture	1
	A) Definition of medico legal and clinical/pathological autopsy. B) Objectives, procedures and formalities of medico legal autopsy. C) Preservation of articles and tissues of importance during autopsy.	Practical	6

11	Mechanical injuries or wounds. A) Definition of wound, injury, hurt, assault, battery.	Innovative (Gp.discn.)	6
	B) Classification of injuries, description of blunt force and sharp force injuries		
	C) Fire arms-principles, types. Examination and interpretation of fire arm wounds. Comparison microscopy.		
	D) Medico legal aspects of injuries: Difference between ante mortem and postmortem injuries, determination of different types of injuries, defense wounds, hesitation cuts, fabricated wounds, simple and grievous hurt, suicidal, accidental and homicidal injuries, causes of death by mechanical injuries, legal classification of fatal injuries.	Practical	6
	E) Regional injuries: Injuries to head, neck, thorax, abdomen, pelvis, genitalia, vertebral column and bones.		
	F) Injuries due to traffic occurrences. G) Injuries due to physical agents and their medico legal importance: (Project) Heat, cold electricity and lightning. Explosion injuries.	Innovative	4

12.	Asphyxial deaths: Definition, causes, types, postmortem appearances and medico legal significance of violent-asphyxial deaths like hanging, strangulation, suffocation, smothering, choking, drowning, traumatic asphyxia.	Lecture Innovative (Gp.discn)	4 2
13	medico legal aspects of Deaths due to starvation-forced feeding.	Practical	4
	Human sexual functions:	Lecture	2
14	A). Potency, sterility, virginity, pregnancy, delivery. B) Abortion, MTP, sterilization, artificial insemination and their legal aspects. C) Sexual offences and abnormal sexual practices. D) Legal aspects of the above.	Lecture Innovative (Gp.discn) Lecture	3 2 1 2

15	Infant and childhood deaths: Viability and determination of intrauterine age of the foetus, live birth, still birth, dead born. Sudden infant death syndrome, child abuse.		
16.	Biological fluids: A) Blood-preservation and dispatch of samples, importance of blood groups in disputed paternity, hazards of blood transfusion. B) Seminal fluid and salivary stains-preservation, dispatch and importance of grouping. C) Principles of laboratory tests for identification of the above and interpretation of the results	Lecture Practical	1 3
17	Forensic psychiatry: Definition A) Nature and brief overview of common mental illnesses. B) True and feigned mental illnesses C) Civil and criminal responsibilities of mentally ill persons. D) Indian mental health act with special reference to admission, care	Lecture	3

18.	Medical jurisprudence: A) Indian medical council and state medical councils, their functions and disciplinary control. B) Duties and rights and privileges of a registered medical practitioner. C) Professional conduct, etiquette and	Lecture Innovative (Gp.discn) Innovative	2 2 2 2
	ethics in medical practice. - Ethics underlying human interactions - Respect, Trust, confidentiality in doctor – patient relationship - Cardinal Principles of medical ethics- Autonomy, Beneficence, Non-Maleficence, Justice Seminar – with case examples D) Professional secrecy and privileged communication. E) Medical negligence: Civil, criminal, contributory negligence, vicarious responsibility, res-ipsa-loquitur prevention of negligence and defence in medical negligence suits. F) Consent; Types, age in relation to consent, consent in relation to mental illness and alcohol intoxication,	Innovative (Seminar)	

	consent in emergency situations. Informed Consent as a bond of trust between patient and the doctor. Empowering Autonomy through information sharing		
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19.	Forensic toxicology: Definition and general principles	Lecture	2
	A) of management of a case of poisoning.	Innovative (Seminar)	5 4
	B) Medico legal duties of a doctor in poisoning a case of , preservation and dispatch of viscera for chemical analysis. Role of chemical examiner's laboratory and forensic science laboratory in brief.	Innovative	
	C) Diagnosis and principles of therapy and medico legal aspects of the following poisons, giving special emphasis to those of regional importance	Integration	
	-a) Corrosive poisons: strong mineral acids, alkalies and organic acids-(carbolic, formic and oxalic acid).	Pharmacology	
	b) Metallic poisons: Lead, Arsenic, Mercury		

c) Animal poisons-snake and scorpion bites. d) Delirants: Dhatura, Cannabis and Cocaine. e) Inebriants: Methyl and Ethyl alcohol. f) Asphyxiants: Carbon monoxide, carbon dioxide, Hydrogen sulphide and Cyanides. g) Cardiac poisons: Cerbera odollam, Cerbera thevetia, Nerium odorum. h) Insecticides: Organophosphorous compounds, Carbamates and Organochloro compounds, Aluminium phosphide and Zinc phosphide. D) Drug abuse and dependence. E) Inorganic non metallic poisons: Phosphorous. F) Organic vegetable irritants: Abrus precatorius, capsicum, calotropis, Semicarpus anacardium, Croton. G) Convulsants: Strychnine. H) Paralytic agents: Curare. I) War gases and industrial gases. J) Chloral hydrate. K) Mechanical poisons.	Practical Innovative (Gp.discn)	
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SKILLS	Level of achievement			
	Able to perform independent	Able to perform under guidance	Assist	Observe
1. Prepare certificates of birth and death. Prepare death verification Differentiating Death verification and death certification			1	
2. Prepare dying declaration.			2	
3. Give evidence in court of law as expert witness.				3
4. Collect, preserve and properly label and dispatch specimens of medico legal importance.	4			
5. Diagnose and manage common acute and chronic poisoning.		5		
6. Perform medico legal duties in case of poisoning.		6		
7. Observe ten medico legal autopsies and enter in practical record.				7
8. Age estimation from bones, skiagrams and dentition	8			
9. Examination of injuries and weapons and report writing.	9			
10. Examination of an alcohol intoxicated person and report writing.	10			
11. Examination of victim and accused in sexual offence cases.	11			
12. Study of specimens of poisons.	12			
13. Study of wet and models, charts etc.dry specimens,	13			

Suggested topics for integrated teaching

1. Examination of injured person and report writing. Integration with surgery casualty posting.
2. Examination of victim of sexual assault cases and report writing. Integration with casualty management posting.
3. Forensic psychiatry. Integration with psychiatry posting.
4. Management of cases of poisoning. Integration with medicine.
5. Drug abuse and drug dependence. Integration with pharmacology.
6. Integrated learning of common ethical issues in clinical practice—eg informed consent, end of life, patient autonomy, distributive justice, non maleficence .
7. Medico legal issues in Clinical practice including casualty
8. Medical documentation and Medical records
9. Death due to anaphylaxis
10. Death in Hospitals (Anaesthetic/Surgical/Alleged negligence)

Suggested topics for e-learning

1. Ethical and medico legal issues in clinical practice. Examples for this topic in real life situations - Integrated learning with invited clinical faculty- giving actual patient examples of medico-legal dilemmas.
2. Child abuse.
3. POCSO Act
4. HIV/AIDS.
5. Torture medicine.
6. Lie detection.
7. Narco analysis.
8. Brain finger printing

Prescribed books

1. Practical Forensic medicine. B.Umadethan, CBS publishers & distributors.
2. Forensic Medicine and Toxicology, Dr.P.C. Ignatius.
3. Forensic medicine, P.V. Guharaj, 2nd Edition, University press.
4. Text book of Forensic medicine and Toxicology-principles and Practice, Krishan Vij, 4th Edition, Elsevier

Reference books

- 1 . Essentials of Forensic medicine and toxicology. K.S. Narayana Reddy, 29th Edition.
- 2 . Modis text book of Medical Jurisprudence and Toxicology, 23rd Edition, Lexis Nexis.

3. Text Book of Forensic medicine and Toxicology by Nagesh Kumar G.Rao, 2nd Edition. Jaypee brothers Medical Publishers
4. Principles and practice of Forensic medicine. Dr. B. Umadethan 2008, Swami Law Publishers.
5. Parikhs Text Book of Medical Jurisprudence, forensic medicine and Toxicology, 6th edition, CBS Publishers and Distributors.
- 7 J.B. Mukherjee's forensic medicine and Toxicology. R.N. Karmakar 2007.

Evaluation

Internal assessment examinations may be conducted as per the discretion. examination per semester, without violating MCI norms. : Minimum one

Theory	40
Internal assessment	10
Viva	10
Total	60
Practicals	30
Internal Assessment	10
Total	40
Grand Total	100

Topics and mark allotment

Medical jurisprudence (Ethics to be given due importance)	20%
Court and legal procedures	10%
Thanatology, M/L autopsy	8%
Asphyxial deaths	10%
Traumatology	10%
Sexual jurisprudence	20%
Infanticide	10%
Trace evidences	5%
Forensic psychiatry	2%
Toxicology	5%

MICROBIOLOGY

A. GOAL

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

community.

B.OBJECTIVES

1. Knowledge

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

- i. State the infective microorganisms of the human body and describe the host parasite relationship
- ii. List pathogenic microorganisms (bacteria, viruses, parasites, fungi) and describe the pathogenesis of the diseases produced by them
- iii. State or indicate the mode of transmission of pathogenic and opportunistic organisms and their sources including insect vectors responsible for transmission of infection
- iv. Describe mechanisms of immunity to infections
- v. Acquire knowledge on suitable antimicrobial agents for treatment of infections and scope for immunotherapy and different vaccines available for prevention of communicable diseases
- vi Antibiotic policy/stewardship
- vii.National control programs for infectious diseases. Eg. RNTCP, Malaria control program,STDs, NACO, Immunisation program.
- viii Apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections
- vii. Recommend laboratory investigations regarding bacteriological examination of food, water, milk and air.

2. Skills

At the end of the course the student shall 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 tests and determine the efficacy of antimicrobial agents against them.
3. Perform commonly employed bedside tests for detection of infectious agents such as blood film for malaria, filaria, gram staining, Acid Fast Bacilli (AFB) staining and stool sample of ova cyst etc.
4. Use the correct method for collection, storage, and transport of clinical specimens for microbiological investigations.
5. .To learn to use the principles of evidence based discision making of microbiological tests.

3. Integration

The student shall understand infectious diseases of national importance in relation to

clinical, therapeutic and preventive aspects

C. DETAILED SYLLABUS

Duration of the course: 3 semesters-III, IV, V Total Number of Hours: 250 Lectures: 80

Practicals: 80 Innovative sessions: 90 (Project work, Seminars, Structures discussions, Integrated teaching, Formative evaluation, revision)

(The teaching should stress on Pathogenesis, Laboratory diagnosis, sterilization and disinfection, infectious diseases common in Kerala and India, Hospital infection, antibiotic use, Principles of immune prophylaxis and immunotherapy and applied and clinical microbiology. Basic morphology and life cycle of parasites required for lab diagnosis. Certain portions to be deleted—Detailed morphological, cultural, Biochemistry, and Antigenic characters,)

DETAILS OF LECTURES

80hrs

I. General microbiology

12hrs

- Introduction to microbiology
- Morphology of bacteria comparison with other microbial forms
- Growth, nutrition culture media
- Identification of bacteria
- Bacterial genetics
- Antibacterial agents and antibiotic sensitivity test
- Infection-Source and spread of infection
- Sterilisation and disinfection
- Response to microbial infections

II. Systematic bacteriology

25 hrs

1. Gram positive Cocci-Staphylococci, Streptococci, Pneumococci
2. Gram negative Cocci-Neisseria
3. Gram Positive Bacilli-Corynebacterium, Listeria, Bacillus
4. Mycobacteria, Nocardia, Actinomyces
5. Clostridia, Nonsporing anaerobes.
6. Gram negative Bacillus-Haemophilus, Bordetella, Brucella, Enterobacteria/Yersinia
7. Pseudomonas, Pasteurella, Acinetobacter
8. Vibrio/Campylobacter
9. Mycoplasma, Legionella, Rickettsia, Chlamydia
10. Spirochetes

III. Virology

15 hrs

1. General characteristics of viruses.
2. Virus host interaction

3. Replication of virus
4. Pox virus, Herpes, Adenovirus
5. Papova, Retrovirus
6. Myxoviruses
7. Picorna virus
8. Hepatitis, Miscellaneous
9. Rhabdo virus
10. Arboviruses
11. Oncogenic viruses
12. HIV
13. Bacteriophages

IV. Immunology

12hrs

1. Introduction Classification, type and cells involved in immunity
2. Antigen, Antibodies
3. Complement in health and diseases
4. Hypersensitivity
5. HLA antigens in health and diseases
6. Immunodeficiency diseases
7. Serological test in medical practice
8. Auto immunity
9. Tumour and transplantation immunology
10. Immunoprophylaxis and immunotherapy
11. Immunohaematology

V. Parasitology (Topic presentation)

12 hrs

1. Introduction of parasitic disease
2. Protozoal infections-Amoebiasis, Plasmodium, Leishmaniasis, Trypanosoma, Giardia, Balantidium, Cryptosporidium, Trichomonas, Toxoplasma, Pneumocystis-laboratory diagnosis of protozoal infection
3. Helminthus-intestinal nematodes, tissue nematodes, cestodes, trematodes-Laboratory diagnosis of helminthic infections

VI. Mycology

4 hrs

1. Introduction-Classification of fungi and general principles of lab diagnosis
2. Superficial infections
3. Subcutaneous infections-Mycetoma, Rhinosporidiosis

DETAILS OF PRACTICALS AND DEMONSTRATION		40 hrs
1. Techniques Simple stain, Gram Stain, Ziehl –Neelsen stain,		
Fungus Lactophenol cotton blue,		
Parasitology stool examination		
2. Clinical microbiology (Demonstration cum practical)		60hrs
a.	Oropharyngeal infection	
b.	Wound infection	
c.	Respiratory tract infections	
d.	Meningitis	
e.	Gastro intestinal infections	
f.	Urinary tract infections	
g.	Urethritis	
h.	Blood culture techniques	
i.	Equipments/Instruments	
j.	Interpretation of lab results	
k.	Infection control measures	
l.	Community outbreak investigation and control measures	
m.	Antibiotic stewardship and antibiotic policy	

APPLIED MICROBIOLOGY (Discussion and Integrated teaching)

60hrs

1. Upper respiratory tract infections, infections of eye and ear
2. Pneumonia, Tuberculosis, Bronchitis-Aetiology, lab diagnosis, Prophylaxis
3. Rheumatic fever-Endocarditis, Myocarditis
4. Urinary tract infections
5. Enteric fever-P.U.O
6. Gastroenteritis-Cholera, other causes
7. Osteomyelitis-Arthritis, TB of bone
8. Meningitis, Pyogenic, Aseptic
9. Opportunistic infections
10. Sexually transmitted diseases
11. Hospital infection
12. Antimicrobial agents

TUTORIAL

10hrs

1. Normal flora
2. Anaerobic infections
3. Collection, transportation and preliminary processing of specimens
4. Laboratory diagnosis of viral infections
5. Investigations of epidemics in the hospital and community

TEXTBOOKS RECOMMENDED

Prescribed Books

1. Textbook of Microbiology by R. Anantha Narayanan and C.K.J. Paniker 7th Edition Orient Longman
2. A guide to Microbial Infections, Pathogenesis, Immunology, Laboratory diagnosis and Control by Greenwood. Slack and Penhale
3. Essentials of Medical Microbiology, Apurba Sankar Sastry, Sandhya Bhatt.K
4. Textbook of Microbiology and Immunology, Subash Chandra Parija
5. Textbook of Parasitology by C. K. J. Paniker / Chakraborty / Pareja
6. Textbook of Parasitology by Chatterjee.

Reference Books

1. Medical Microbiology by Jawetz E, Melnick J L, Adelberg E A
2. Textbook of Immunology, Kuby

EVALUATION: There should be regular formative assessment

Internal assessment : The internal assessment marks for Microbiology are 15 for Practical and 15 for Theory. Since the minimum required for appearing for University exam is 35% the total minimum marks required for internal assessment would be 5.5 out of 15, There need to be a separate minimum for Practical and Theory internal assessment.

The total marks for Microbiology is 150 (Theory 80 (2 papers) + Viva 15 + Practical 25 + internal assessment 30).

The pass has to be decided as follows:

1. A candidate must obtain minimum 50% marks separately for University theory examination
2. A candidate must obtain minimum 50% marks separately for University practical examination
3. Total aggregate marks should be 75 out of 150 marks or more for pass.
4. Theory and Practical Internal assessment marks should be added to the marks obtained in Theory and Practical University exams respectively for deciding the pass
5. For Theory (80 + 15 viva + 15 marks internal assessment = 110) the minimum for pass should be 55 marks.
6. For Practical (25 + 15 marks internal assessment = 40) the minimum for pass should be 20 marks

Microbiology-Two papers of 2 hour duration of 40 marks each

Microbiology paper I-General bacteriology, Immunology, & systematic bacteriology.

Structured Essay =	10 marks
Short Essays (2 X5) =	10 marks

Short answer questions (10 X2) = 20 marks

Total = 40 marks

Microbiology Paper II – Virology, Parasitology, Mycology, Clinical Microbiology

Structured Essay = 10 marks

Short Essays (2 X5) = 10 marks

Short answer questions (10 X2) = 20 marks

Total = 40 marks

Total marks (40 + 40) = 80 marks

Internal assessment = 15 marks

Viva voce = 15 marks

Total for theory = 110 marks

(Duplication of the questions should be avoided)

Practicals

Internal assessment -15 marks. University –25 marks

University Practical -Exercises

1. Gram staining (Clinical material) – 5marks
2. AFB staining (Clinical Material) – 5 marks
3. Applied microbiology – 5 marks
4. Spotters-10 numbers – 10 marks (preferably OSPE)
2 minutes for each spotter, 2-4 sub questions with each spotter.
(2 Mycology, 3 Parasitology, 2 General Bacteriology, 2 Virology/Immunology & 1 Clinical Bacteriology)

PATHOLOGY

GOALS

The broad goal of teaching undergraduates Pathology is to impart the knowledge skills and attitudes in the learner to understand the etiopathogenesis, morphology and pathological concepts related to various common diseases.

Learning Objectives

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

1. Know the principles of collection, handling, storage and dispatch of clinical samples from patient, in a proper manner.
2. Perform and interpret in a proper manner the basic clinico-pathological procedures.
3. Have an understanding of the common hematological disorders and the investigations necessary to diagnose them and determine their prognosis.
4. Understand the concept of cell injury, the change produced thereby, in different tissues and organs and the body capacity for healing.

5. Understand normal haemostatic mechanism, the derangements of these mechanisms and the effect on human system.
6. Understand the etiopathogenesis, the pathological effects, and the clinico pathological correlation of common infectious and non-infectious diseases.
7. Understand the concept of neoplasia with respect to etiology, gross and microscopic features, diagnosis and prognosis of neoplasia in different tissues and organs of the body.
8. Correlate normal and altered morphology (gross and microscopy) of different organ systems in different diseases to the extent needed for understanding of the disease processes and their clinical significance.
9. Have knowledge of common immunological disorders and their effects on human body.

Course content

1. Cell injury-

7Hrs

- Cause and mechanism: Ischemic, Toxic injury and Apoptosis
- Reversible cell injury: Types morphology, hyaline, fatty change
- Irreversible cell injury: Types of necrosis, gangrene
- Calcification: Dystrophic and Metastatic calcification

2. Inflammation and repair

7Hrs

- Acute inflammation: features, causes, vascular and cellular events.
- Morphological variants of acute inflammation
- Inflammatory cells and mediators
- Chronic inflammation: causes, types, non – specific and granulomatous with common examples
- Wound healing by primary and secondary union, factors promoting and delaying the process and complications.

3. Immunopathology

5Hrs lecture +2hrs symposia

- Immunopathology: organization, cells, antibodies and regulations of immune responses
- Hypersensitivity: types and examples, antibody and cell mediated
- Tissue injury with examples.
- Autoimmune disorders like Systemic Lupus Erythematosus
- Organ transplantation: immunological basis of rejection and graft versus host reaction.
- Amyloidosis, classification, Pathogenesis, morphology.
- HIV-AIDS, etiology, modes of transmission, pathogenesis, pathology, complications, diagnostic procedures and handling of infected materials and health education

4. Infectious diseases

5Hrs lecture +4hrs symposia

- Mycobacterial diseases: tuberculosis and leprosy
- Bacterial diseases: Pyogenic infections, typhoid, diphtheria, gram –ve infections, bacillary dysentery, syphilis
- Viral: polio, herpes, rabies, measles: Rickettsial and Chlamydial infections

- Fungal diseases and opportunistic infections
- Parasitic diseases: malaria, filariasis, amoebiasis, Kala azar, cysticercosis, hydatid disease

5. Circulatory disturbances

5Hrs lecture +2hrs symposia

- Oedema: pathogenesis and types
- Chronic venous congestion: lung, liver, spleen
- Thrombosis and embolism: formation, fate and effects
- Infarction: types, common sites, gangrene
- Shock: pathogenesis, types, morphological changes

6. Growth disturbances

7Hrs lecture

- Atrophy, hypertrophy, hyperplasia, Metaplasia, malformation, agenesis, dysplasia
- Neoplasia: causes, classification, histogenesis, biological behavior, benign and malignant, carcinoma and sarcoma
- Malignant neoplasia: grades and stages, local and distant spread
- Carcinogenesis: Environmental carcinogen, chemical, viral, occupational, hereditary and basics of molecular basis of cancer.
- Tumor and host interaction: systemic effects including para neoplastic syndrome, tumor immunology.
- Premalignant lesions
- Laboratory diagnosis: cytology, biopsy, tumor markers
- Tumors and tumor like conditions of soft tissues.

7. Miscellaneous disorders

4Hrs lecture +2hrs symposia

Autosomal and sex-linked disorders with examples. Genetics-cytogenetics, molecular genetics, non-Mendelian disorders (details of diseases not needed –only inheritance pattern) – lysosomal storage diseases

- Protein energy malnutrition and vitamin deficiency disorders
- Disorders of pigments and mineral metabolism such as bilirubin, melanin, haemosiderin.
- Environmental pathology – pathology of radiation injury and pollution injury (air and food)

8. Haematopathology 15Hrs lecture +2hrs symposia (Symposia for WBC disorders)

- Anaemia: classification and clinical features
- Nutritional anemia: Iron deficiency, folic acid/vit B12 deficiency anaemia including pernicious anemia
- Hemolytic anaemia: classification and investigation
- Hereditary hemolytic anaemia; thalassemia, sickle cell anemia, hereditary spherocytosis and G 6 P D deficiency.
- Acquired Hemolytic anemia: malaria, Kala Azar, autoimmune, alloimmune, drug induced, microangiopathic
- Haemostatic disorders: platelet deficiency, ITP, drug induced, secondary
- Coagulopathies: coagulation factor deficiency, hemophilia, DIC and anticoagulant control
- Leucocytic disorders: Leucocytosis, leucopenia, leukemoid reaction.

- Acute and chronic leukemia : classification and diagnosis
- Multiple myeloma and dysproteinemias
- Blood transfusion: grouping and cross matching untoward reactions, transmissible infections including HIV and hepatitis. Blood components
- Myelodysplastic syndrome
- Myeloproliferative disorders: polycythemia, myelofibrosis

9. Cardiovascular Pathology

5Hrs lecture +4hrs symposia

- Acute rheumatic fever: etiopathogenesis and morphological changes and complications including rheumatic heart disease.
- Infective endocarditis: etiopathogenesis and morphological changes and complications.
- Atherosclerosis and ischemic heart disease: myocardial infarction
- Hypertension (pathology in various organs including kidney) and hypertensive heart disease
- Myocarditis
- Pericarditis
- Cardiomyopathy
- Vasculitis, aneurysm

10. Respiratory pathology

5Hrs lecture +2 hrs symposia

- Structure of bronchial tree and alveolar walls, normal and altered Inflammatory disease of bronchi: chronic bronchitis, bronchiectasis
- Pneumonias: lobar, broncho, interstitial
- Lung abscess: etiopathogenesis and morphology and complications
- Pulmonary tuberculosis: primary and secondary, morphologic types including pleuritis
- Concepts of obstructive and restrictive lung disorders – chronic bronchitis emphysema, Asthma.
- Emphysema: type and pathogenesis.
- Occupational lung disorders: anthracosis, silicosis, asbestosis, mesothelioma.
- Atelectasis and hyaline membrane disease.
- Tumors: Epithelial Malignant Neoplasia of Lung, Etiopathogenesis
- Nasopharyngeal and laryngeal tumors

11. Renal & Urinary tract Pathology

3Hrs lecture +2hrs symposia

- Basics of impaired function and urinalysis
- Glomerulonephritis: classification, primary Proliferative and non-proliferative, secondary (SLE, polyarteritis, Amyloidosis, diabetes)
- Clinical presentation of renal disorders including nephritic, nephrotic syndrome, nephritic-nephrotic syndrome, acute renal failure, recurrent hematuria, CRF
- Morphology of MCD, FSGS, membranous and membranoproliferative GN
- Acute renal failure: acute tubular and cortical necrosis
- Pyelonephritis, reflux nephropathy, interstitial nephritis
- Nephrolithiasis and obstructive nephropathy
- Renal malformations (including dysplastic kidney) and polycystic kidney

- Renal cell tumors: renal cell carcinoma, nephroblastoma.
- Progressive renal failure and end stage renal disease
- Renal vascular disorders
- Urinary bladder: cystitis, carcinoma
- Urinary tract tuberculosis

12. Pathology of Gastrointestinal tract 6Hrs lecture +4hrs symposia

- Oral pathology: leukoplakia, carcinoma oral cavity and carcinoma esophagus
- Peptic ulcer: etiopathogenesis and complications, gastritis types
- Tumors of stomach: benign, polyp, leiomyoma, adenocarcinoma, other gastric tumors.
- Inflammatory disease of small intestine: typhoid, tuberculosis, Crohn's disease, appendicitis.
- Inflammatory disease of large intestine: amoebic colitis, bacillary dysentery, ulcerative colitis
- Large and small intestine tumors: polyps, carcinoid, carcinoma, lymphoma
- Pancreatitis
- Salivary gland tumors
- Ischemic and pseudomembranous enterocolitis, diverticulitis
- Malabsorption – celiac disease, tropical sprue and other causes
- Pancreatic tumors: endocrine, exocrine and periampullary

13. Liver and Biliary tract pathology 5Hrs lecture +2hrs symposia

- Jaundice: types, etiopathogenesis and differentiation
- Hepatitis: acute and chronic, etiology, pathogenesis and pathology
- Cirrhosis: etiology, classification, pathology, complications
- Portal hypertension: types and manifestation
- Diseases of gall bladder: cholecystitis, cholelithiasis, carcinoma
- Tumors of liver: hepatocellular carcinoma, Metastatic tumours, tumor markers

14. Lymphoreticular System 3Hrs lecture

- Lymphadenitis: non – specific, granulomatous
- Non-Hodgkin's lymphoma: classification, morphology
- Hodgkin's lymphoma: classification, morphology
- Thymus-hyperplasia (myasthenia gravis), thymomas
- Diseases of spleen: congestive splenomegaly and infarction spleen.
Hypersplenism. Conditions producing rupture spleen, involvement in storage diseases.

15. Reproductive system 6Hrs lecture +2hrs symposia

- Disease of cervix: cervicitis, cervical carcinoma, etiology, cytological diagnosis
- Hormonal influences of different phases of menstrual cycle and the abnormality associated with it.
- Diseases of uterus: endometrial hyperplasia and carcinoma, adenomyosis, smooth muscle tumors

- Trophoblastic disease: hydatidiform mole and choriocarcinoma
- Diseases of breast: mastitis, abscess, fibrocystic disease Neoplastic lesions: fibroadenoma, carcinoma, phylloides
- Prostate: nodular hyperplasia, carcinoma
- Ovarian and testicular tumors
- Carcinoma of penis
- Pelvic inflammatory disease including salpingitis
- Genital tuberculosis.

16. Osteopathology 2Hrs lecture

- Osteomyelitis: acute, chronic, tuberculosis
- Metabolic diseases: rickets/osteomalacia, osteoporosis, hyper parathyroidism
- Neoplasms: osteosarcoma, osteoclastoma, Ewing's sarcoma, chondro sarcoma and metastatic tumours
- Arthritis: rheumatoid arthritis, osteoarthritis and tuberculous arthritis.

17. Endocrine Pathology 8Hours

- Diabetes mellitus: types, pathogenesis, pathological changes in adrenals, kidney and other organs.
- Non neoplastic lesion of thyroid: Iodine deficiency goiter, autoimmune thyroiditis, thyrotoxicosis, myxedema
- Tumors of thyroid: follicular adenoma. Carcinomas: papillary, follicular, medullary, anaplastic
- Lymphoma of thyroid
- Adrenal diseases: cortical hyperplasia, atrophy, tuberculosis, tumors of cortex and medulla
- Parathyroid hyperplasia and tumors

18. Neuropathology 1 Hours

- Inflammatory disorders: pyogenic and tuberculous meningitis, brain abscess, tuberculoma
- WHO classification of brain tumors
- CNS tumors – primary-glioma and meningioma and Metastatic tumours, schwannoma and neurofibroma
- CSF and its disturbances: cerebral edema, raised intracranial pressure
- Cerebrovascular disease: atherosclerosis, thrombosis, embolism, aneurysm, hypoxia, infarction and hemorrhage.
- Degenerative diseases: Alzheimer's disease and parkinsonism
- Retinoblastoma and malignant melanoma choroid

19. Dermato-pathology 2 Hours

- Skin tumors: squamous cell carcinoma, basal cell carcinoma and malignant melanoma.
- Inflammatory dermatoses of skin –psoriasis, lichen planus, bullous diseases

Examinations Skills

The students should be trained to perform independently the following

1. Be able to collect, store and transport Materials for various pathological tests Including histopathology, Cytopathology, Clinical pathology, hematology and Biochemistry
2. Interpret abnormal laboratory values of Common diseases
3. Do complete urine examination including Microcopy

Do/ perform and interpret haemoglobin estimation, TLC, DLC, ESR, PCV, blood smear preparation (thick and thin) and staining. Reporting peripheral smears

4. Do blood grouping
5. Adapt universal precautions for self-Protection against HIV and hepatitis

Practical:

One – third of allotted practical hours to be devoted to

- a. Performing a complete urine examination and detecting abnormalities and correlating with pathological changes.
- b. To performs with accuracy and reliability basic hematological estimations: TLC, ESR, PCV, DLC, peripheral smear, staining, reporting along with history.

One third of allotted practical hours to be devoted to

- a. Identify and interpret gross and microscopic features of acute inflammations in organs such as appendix, lungs, meninges,
- b. Cellular components of chronic and granulomatous inflammation, c. Granulation tissue, callous
- d. Typhoid, tuberculosis, amoebic ulcers in intestine
- e. Rhinosporidiosis, actinomycosis, malaria, kala-azar, filaria
- f. Amoebic liver abscess, malaria liver and spleen, filarial lymphadenitis, cysticercosis
- g. Fatty liver, Amyloidosis of spleen, kidney and liver
- h. Types of necrosis : caseous, coagulative, liquifactive
- i. Identify and interpret gross and microscopic features of organs in commonly occurring neoplastic and non-neoplastic diseases
- j. Study cytology slides-fibroadenoma,squamous cell carcinoma,granuloma, Adenocarcinoma in fluid, papillary carcinoma thyroid

One third of allotted practical hours to be devoted to

- a. Discussion of case studies -clinical, gross and microscopic features and other

parameters wherever applicable -to learn clinicopathological correlations inclusive of autopsy studies and cytology slides / cases.

Clinicopathology posting Clinical pathology for two weeks may be taken from the dept.willing to provide slots/can be arranged by reallocating the timings of theory classes and it may be done at the level of individual Institutions in accordance with the availability of slots in various departments.

SUGGESTED TOPICS FOR INTEGRATED TEACHING/AUTOPSY/CPC Integrated

seminars

- a. Rheumatic heart disease
- b. Ischemic heart disease
- c. Hypertension and Hypertensive disease
- d. Tuberculosis lung
- e. Nephrotic syndrome
- f. Inflammatory disease of small and large bowel
- g. Cirrhosis
- h. Metabolic bone disease
- i. Diabetes mellitus
- j. HIV/ AIDS
- k. Iron deficiency anemia
- l. Jaundice
- m. Malaria, Dengue, Chikungunya, Avian Flu, swine flu
- n. CML, Hemolytic anemia ,deficiency anemia, Leukemia.
- o. immunology
- p. infectious diseases
- q. clinical pathology(selected topics)
- r. multi-dimentional pathophysiology of chronic diseases

A minimum of seven topics in the integrated teaching should be organized with the help of medical education department and other clinical/nonclinical departments.

TEACHING LEARNING METHODS.

- Structured interactive sessions
- Small group discussion
- Practical including demonstrations using micro image projection system.
- Problem based exercises
- Autopsy case studies
- Self learning tools
- Seminar and symposia

- E-modules (can be done by renovating part of museum as a digital lab)

LEARNING RESOURCE MATERIALS

- Text books
- Reference books
- Practical note books
- Internet resources

EVALUATION:

There should be regular formative assessment. In Formative assessment, day to day performance should be given greater importance and forms the basis of internal assessment.

Internal assessment

The internal assessment marks for Pathology are 15 for Practical and 15 for Theory Since the minimum percentage required for appearing for University exam is 35%, the total minimum marks required for internal assessment would be 5.5 out of 15, There need to be a separate minimum for Practical and Theory internal assessment. The total marks for University exam in Pathology is 150 (Theory 80 (2 papers) + Viva 15 + Practical 25 + internal assessment 30).

The pass has to be decided as follows:

1. Total aggregate marks should be 75 out of 150marks or more for pass.
2. Theory and Practical Internal assessment marks should be added to the marks obtained in
3. Theory and Practical University exams respectively for deciding the pass
4. For Theory (80 + 15 viva+ 15 marks internal assessment = 110) the minimum for pass should be 55marks.
5. For Practical (25 + 15 marks internal assessment = 40) the minimum for pass should be 20marks.

If moderation is given (in the event of no double valuation) it should be added to Theory marks only since the logic for moderation is ambiguity in question paper No moderation need to be given for practical exam.

Before printing, question Paper scrutiny should be strictly enforced in University exams since question papers shows many mistakes, which necessitates moderation

Marks for internal assessment

Theory - 15 marks (including viva)

Practical - 15 marks

One exam for theory at the end of each semester (viva to be conducted preferably with each exam)

The last exam will be as per University exam pattern-theory, practical and viva

Internal assessment may be calculated as follows

Theory =15 marks (minimum 3 exams)

Final theory exam - 5marks

Best of other two exams - 5 marks

Seminar presentation/class tests - 2 marks

Viva - 3 marks

Practical = 15 marks

Records = 1 mark (Histopathology, clinical pathology and Autopsy/CPC records)

Records to be maintained and evaluated – Histopathology record, clinical pathology record, a common record of Post mortem findings in 10 cases and 5 clinicopathological conferences Practical = 14 marks

The details of marking scheme for Pathology Practical would be

	Internal Assessment exam marks	University exam marks
Peripheral smear Reporting	20	10
Clinical Pathology Exercise	20	10
(1 out of 6)		
Blood grouping	20	10

Urine analysis	20	10
Spotters (20x3)	60	(20x3) 60
Records (4+3+3)	10	
(HP + CLIP + Ax/ CPC) TOTAL	150	100
To be converted to	15	25

Marks for Record has to be added to Internal assessment in Practical only and not in the University Practical since it will result in duplication.

University examinations

Marks break up are

Theory 80 marks

Theory internal assessment 15 marks

Viva 15 marks

Total for theory 110 marks

Practical 25 marks

Practical internal assessment 15 marks

Total for practical 40 marks

Grand total for Pathology 150 marks

Pattern of theory paper (University)

There will be 2 theory papers of 2 hours duration

The theory papers for University are Paper I 40 marks and Paper II 40 marks.

The content area would be Paper I =Clinical pathology (disease aspects of hematology will be included in paper II only) + General Pathology Paper II = Systemic Pathology + Hematology

Detailed pattern of theory questions

Out of 40 marks for each paper the marking scheme would be :

Answer in single sentence- $(4 \times 1/2) = 2$ marks

STRUCTURED(Case Study) ESSAY = 6 marks

Short answers questions(SAQ) $4 \times 2 = 8$ marks

STRUCTURED ESSAY = 8 marks

Write short notes on: $(4 \times 4) = 16$ marks

Section A and B are needed in each paper only if there is no double valuation so

that each examiner can value one paper

If there is section A and Section B then the marking scheme for each paper will be as follows:

Paper I

	20
Section A	= marks
Single word type	= 2 marks
Problem based structured essay	= 6 marks
SAQ-4 questions	= 8 marks
Short notes- 1 question	= 4 marks
	20mark
Section B	= s
Standard/modified	= 8 marks

Paper II

	20
Section A	= marks
Short notes	= 4 marks
Single word type	= 4 marks
Problem based structured essay	= 6 marks
SAQ-2 questions	= 6 marks
	20
Section B	= marks
Standard/modified	= 8 marks
	12
essay SAQ-4questions	= marks

Practical-OSPE-(objective structured practical examination)

Total marks = 25 marks

No marks for records in the university practical

Practical marks to be split up as follows

Procedural stations =four =15 marks

Response stations/spotters=20 stations = 10

Procedure stations (15 minutes per station) **(questions can be asked during the procedure)** Blood grouping

Urine analysis (including sediments demonstrated as charts)

Peripheral smear preparation (thick and thin) /staining / Hb estimation/TLC/ESR/PCV

Peripheral smear reporting (one out of 5)

HMA AML

CML

Neutrophilia

Eosinophilia

Response station (spotters) (2minutes each=20 stations) (with questions)

Specimens-mounted and wet =7

Histopathology slides =6

Hematology slide =2(one bone marrow)

Cytology slide =1 (20% should be with Clinico pathologic correlation (CPC) i.e. 4 spotters in CPC)

Histogram interpretation =1

Interpretative clinical pathology charts with photos =1

Clinicopathological correlative exercise (specimens/slide combinations with clinical history) =1 Instruments =1

Viva =15 marks

Total 4 stations for viva

Stations will be for Clinical pathology and hematology

General pathology

Systemic pathology I

Systemic pathology II

Pathophysiology of Pain

Practicals guidelines

The slides for histopathology will be divided into 30 for spotting and drawing in records and 20 for demonstration in class.

There would be

HISTOPATHOLOGICAL SLIDES

For diagnosis/spotting		For demonstration	
1	Acute Appendicitis	1	CVC Lung
2	Granulation tissue	2	CVC Liver
3	Calcinosis cutis	3	Filarial Lymph node
4	T.B. lymph adenitis	4	Infarction (Spleen/placenta)
5	Lepromatous Lepresy	5	Actinomycosis/Aspergillosis
6	Rhinospondrosis	6	Fatty liver
7	Capillary Haemangioma	7	Warthin's tumor
8	Cirrhosis Liver	8	Neurofibroma
9	Lipoma	9	Intradermal anevus

10	Leiomyoma	10	NHL
11	Fibroadenoma	11	HCC
12	Pleomorphic Adenoma	12	Cavernous Haemangioma
13	Schwanoma	13	Secretory endometrium
14	Osteochondroma	14	Adenoma thyroid
15	Malignant Melanoma skin	15	Molluscum contagiosom
16	Squamous cell carcinoma skin	16	Vesicular mole
17	BCC	17	Adenomyosis/endometriosis
18	Hodgkin's lymphoma	18	Mets lymphnode from SCC
19	MNG	19	Bronchopneumoma
20	Papillary carcinoma thyroid	20	Nephro blastoma
21	Hashimoto's thyroiditis		
22	Giant cell Tumor bone		
23	Osteosarcoma		
24	Adenocarcinoma colon		
25	Teratoma ovary		
26	Infiltrating duct carcinoma		
27	Renal cell carcinoma		
28	Tuberculoid Leprosy		
29	Atheroma aorta		
30	Meningioma		

History for Histopathology slides can be given by examiner for spotting.

The specimens for histopathology will be divided into 50 for spotting /diagnosis and 23 for demonstration categories.

There would be

Specimens

For spotting /

for demonstration

GIT

- | | |
|---|--|
| 1. Chronic Gastric Ulcer | 1. Gangrene intestine with round worms |
| 2. Carcinoma Stomach with omental – metastasis, cancer pain , Nociceptive. Neuropathic pain , visceral pain | |
| 3 Lipomatous polyp intestine | |
| 4. Polyp small intestine | |
| 5 Typhoid ulcer intestine | |
| 6 Multiple Polyposis large intestine | |
| 7. Intussuception intestine | |
| 8 Gangrene intestine | |
| 9 Tuberculous ulcer intestine with stricture | |
| 10. Amoebic ulcer large intestine | |
| 11 Acute appendicitis | |
| 12. Carcinoma colon | |

HEPATOBIILIARY SYSTEM & PANCREAS

- | | |
|--------------------------------------|---------------------|
| 1. Cirrhosis liver (Macronodular) | 1.Fatty liver |
| 2. Calculous cholecystitis | 2.Amyloidosis liver |
| | Amoebic liver |
| 3. Calcifying Pancreatitis | 3.abscess |
| 4.CVC liver | |
| 5.Angioma liver | |
| 6.Hemochromatosis liver- Perls stain | |

SPLEEN

- 1.CVC Spleen
- 2.Infarction Spleen

FGS

1. Carcinoma Cervix
2. Leiomyoma uterus
3. Benign cystic Teratoma ovary
4. Adenomyosis uterus
5. Adenocarcinoma uterus
6. Vesicular mole
7. Choriocarcinoma uterus

MGS

1. Carcinoma Penis

BREAST

1. Fibro adenoma breast
2. Carcinoma breast

EYE

1. Retinoblastoma
2. Melanoma – Eye

RESPIRATORY SYSTEM

1. Fibrocasseous tuberculosis lung
2. Pulmonary artery embolism
3. Lung abscess
4. Bronchogenic Carcinom
5. Lobar pneumonia
6. Hydatid cyst lung

CVS

- | | |
|---------------------------------|---------------------------|
| 1. Atheroma aorta with thrombus | 1. Aneurysm aorta |
| | 2. Fibrinous pericarditis |
| | 3. Mural Thrombus Heart |

LYMPHNODES

1. Caseating TB adenitis
2. Lymphoma

THYROID

1. Multinodular goitre
2. Carcinoma thyroid

SALIVARY GLAND

1. Pleomorphic adenoma
2. Diffuse colloid goiter
3. Hashimoto's thyroiditis
4. Adenoma thyroid

BONE

- | | |
|---------------------------|----------------------|
| 1. Sequestrum | 1. Melanoma deposits |
| 2. Osteochondroma | 2. Malunion |
| 3. Giant cell tumour bone | |
| 4. Osteogenic sarcoma | |

CNS

1. Suppurative Meningitis

SKIN AND SUBCUTANEOUS TISSUE

1. Calcinosis Cutis
2. Lipoma
3. Squamous cell Carcinoma Foot
4. Basal Cell Carcinoma
5. Melanoma Foot
1. Filariasis skin

URINARY SYSTEM

1. Renal Cell Carcinoma
2. Nephroblastoma
3. Carcinoma bladder
4. Hydronephrosis
5. Nephrolithiasis

The slides for hematology will be divided into 10 for spotting and 10 for demonstration. They would be

Hematology

For spotting		Demonstration	
1	HMA	1	Filaria
2	AML	2	Lymphocytosis with atypical lymphocyte
3	CML	3	Spherocyte-Spotter
4	Neutrophilia	4	Reticulocyte
5	Eosinophilia	5	Thalassemia with target cells
6	Megakaryocyte	6	Toxic granules
7	LE cell	7	Myeloperoxidase stain
8	Multiple myeloma	8	Megaloblast
9	Normoblast	9	Sickle cells-Spotter
10	Malaria – PV/PF	10	CLL
11	A plastic anaemia		

Cytology slides (for spotting)

1. Fibroadenoma
2. Granulomatous reaction lymph node
3. Squamous cell carcinoma sputum
4. Cervical smear Invasive squamous cell carcinoma
5. Adenocarcinoma in body fluids
6. Papillary carcinoma thyroid

Recommended Textbooks

Pathologic Basis of Disease-Robbins and Cotran 7th edition

Text Book of Pathology-Harsh Mohan 6th edition

General and Systematic Pathology-5th edition-JCE Underwood

Haematology-G E De Gruchy

Text and Practical Haematology MBBS-Tejinder singh

Manual of Basic Techniques for Health laboratory-WHO

PHARMACOLOGY

I. Goal:

The broad goal of teaching Pharmacology to undergraduates is

- To impart knowledge, skills and attitudes to the students so that they can prescribe drugs safely, effectively and maintain competency in professional life.
- To inculcate in them a rational and scientific basis of therapeutics.

II. Educational Objectives. a)

Knowledge

At the end of the course, the learner shall be able to

- describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs
- list the indications, contraindications, interactions and adverse reactions of commonly used drugs
- indicate the use of appropriate drug in a particular disease with consideration of its cost, efficacy and safety for individual needs, and mass therapy under national health programmes
- integrate the list the drugs of addiction and recommend the management
- classify environmental and occupational pollutants and state the management issues
- explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy, old age, renal and hepatic failure
- explain the concept of rational drug therapy in clinical pharmacology with special focus to usage of antimicrobial drugs.
- prescribe drugs for the control of fertility and be aware of the effects of drugs on the foetus.
- describe the clinical presentation and management of common poisoning including the bites and stings.

- state the principles underlying the concept of 'Essential Drugs'
- evaluate the ethics and modalities involved in the development and introduction of new drugs
- understand principles of Evidence based Medicine
- understand the principles of pharmacoeconomics

(b) Psychomotor Skills:

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

- prescribe drugs for common ailments
- identify adverse reactions and interactions of commonly used drugs
- interpret the data of experiments designed for the study of effects of drugs and bioassays which are observed during the study
- scan information on common pharmaceutical preparations and critically evaluate drug formulations
- load the required dose of medicines accurately in hypodermic syringes; inject medicines by the intradermal, subcutaneous, intramuscular and intravenous routes using aseptic techniques.
- Set-up an intravenous drip and adjust the drip rate according to required dosage.
- calculate the drug dosage using appropriate formulae for an individual patient.
- administer the required dose of different drug formulations using appropriate devices and techniques (e.g., hypodermic syringes, inhalers, transdermal patches etc.)
- Advise and interpret the therapeutic monitoring reports of important drugs
- recognize and report adverse drug reactions to suitable authorities.
- analyse critically, drug promotional literature for proprietary preparations in terms of
 - (a) Pharmacological actions of their ingredients
 - (b) Claims of pharmaceutical companies
 - (c) Economics of use
 - (d) Rational or irrational nature of fixed dose drug combinations.
- retrieve drug information from appropriate sources especially electronic resources

(c) Attitudes & Communication skills:

At the end of the course, the learner shall be able to

- communicate with patients regarding proper use of drug
- take adequate precaution during prescribing drug(s)
- understand the legal aspects of prescription
- counsel patients for compliance
- take adequate care to write prescriptions legibly
- understand rationality of polypharmacy
- update themselves regarding recent advances

- Basic Clinical communication skills

Examples of good and poor communication as Role Play - affecting rapport with patient and family, therapeutic relationship, trust, diagnosis and management. The stages of grief as described by Elisabeth Kubler Ross

(d) Integration

Practical knowledge of rational use of drugs in clinical practice will be acquired through integrated teaching vertically with pre-clinical & clinical subjects and horizontally with other para-clinical subjects.

DETAILED SYLLABUS

1. Period of training: 3rd, 4th & 5th Semester
2. Duration of training: one and a half years
3. Eligibility: Must have cleared Phase I (Anatomy, Physiology, Biochemistry)
4. Time available for teaching: 300 hours

Lectures: 125 hours Practicals: 75 hours

Innovative sessions & Internal Assessments: 100 hours

DETAILS OF LECTURES Topic Time (hours) Part I (Drug Oriented teaching)

1. General Pharmacology and basic concepts of clinical Pharmacology 16 hours

- Introduction – definition, scope, various branches, drug nomenclature, orphan drugs
- Mechanism of drug action /Pharmacodynamics (Receptor/Molecular mechanism is desirable to know)
- Scope & relevance of clinical pharmacology
- Routes of administration of drugs, new drug delivery system.
- Pharmacokinetics – Absorption, distribution, metabolism and excretion.
- Factors modifying drug action and drug dosage
- Drug interactions and pharmacogenomics
- Adverse drug reactions and Pharmacovigilance; Therapeutic drug monitoring and adherence
- Essential drugs and fixed drug combination including pharmacoconomics
- Rational use of drugs

2. Autonomic nervous system 12 hours

- Cholinergic neurotransmission and cholinergic drugs
- Anticholinergics
- Adrenergic neurotransmission and adrenergic drugs
- Antiadrenergic drugs Skeletal muscle relaxants NO, VIP (self-study)

3 Autacoids and related drugs 3 hours

Histamine receptor antagonists, their pharmacological actions, indications, adverse effects and precautions

Pharmacology of drugs on prostaglandins and leukotrienes

5HT receptors and their antagonists including treatment of migraine

4 Central nervous system 24 hours

Drugs used in epilepsy and neuropathic pain ; selection of appropriate drug for various

types of epilepsy and adverse drug effects

Sedative – hypnotics used currently in clinical practice, indications contraindications, adverse effects, drug interactions

Opioid analgesics: Pharmacological actions, indications, contraindications adverse effects and drug interactions of commonly used analgesics

NSAIDs: Pharmacological action, indications, contraindications, adverse effects and drug interactions of commonly used drugs. WHO Analgesic ladder Ladder Drugs and Emphasise on practical application of NSAIDs, weak and strong opioids.

Drug used in the treatment of parkinson's disease: anticholinergic agents, dopamine agonists, MAOI, COMTI: Their indications, contraindications, adverse effects and drug interactions.

Disease modifying agents in the treatment of rheumatoid arthritis.

Pharmacology of ethanol and methanol poisoning

Agents used in the treatment of gout (acute and chronic)

Antidepressants use in neuropathic pain

Drugs of addiction abuse and dependence (self-study)

Drugs in manic depressive illness and psychosis General anaesthetics; cardinal features, merits and

demerits of commonly used anaesthetics ,drug interactions

Preanaesthetic agents; uses, indications, contraindications adverse effects and drug interactions.

Local anaesthetic agents: Pharmacological basis, adverse drug reactions, indications and complications of spinal anaesthesia

Adjuvant analgesics – and use in chronic pain

Drugs for treatment of Alzheimer's disease and cognitive enhancers – (seminar)

5 Cardiovascular System

15 hours

Anti-hypertensive drugs: MOA; adverse drug reactions drug interactions and basis of combining commonly used drugs

Pharmacology of calcium channel blockers Drugs affecting Renin-Angiotensin system Approaches to treatment of myocardial infarction. Drug used in treatment of angina pectoris.

Drug treatment of peripheral vascular disease (self-study)

Management of pain in PV diseases Pharmacology of vasodilators and cardiac glycosides; usage in CHF

Treatment of Paroxysmal supraventricular tachycardia, atrial dysrhythmias, sudden cardiac arrest and ventricular fibrillation.

Diuretics: Mechanism of action, pattern of electrolyte excretion under their influence, short term side effects and long term complications of diuretic therapy, therapeutic uses of diuretics; antidiuretics.

6. Drugs affecting blood and blood formation

6 hours

Anticoagulants: MOA of heparin and oral anticoagulants indications, monitoring of therapy and treatment of bleeding due to their overdose, drug interactions.

Drugs inhibiting platelet aggregations, their indications and precaution for their use

Antianaemic drugs (seminar)

Treatment of shock (seminar)

Fibrinolytics and antifibrinolytics: indications, adverse reactions.

Hypolipidemics: MOA, adverse reactions and indications

7. Respiratory system

2 hours

- Drug use in treatment of bronchial asthma
- Antitussives, expectorants & mucolytics (seminar)

8. GIT

3 hours

- Pharmacotherapy of peptic ulcer: MOA, adverse drug reactions, contraindication and precautions

Antiemetics: MOA, uses, side effects.

Drug used in ulcerative colitis and irritable bowel syndrome Management of constipation and diarrhoea (seminar)

9. Drugs acting on Endocrine system

9 hours

- Thyroid hormones and antithyroid drugs: pharmacological action, indications, contraindications and side effects
- Drugs use for pharmacotherapy of diabetes mellitus, mechanism of actions, contraindications, precautions during the use and side effects. Management of iatrogenic hypoglycemia and diabetic ketoacidosis.
- Sex hormones, their analogues and antagonists, uses in replacements and pharmacotherapy. Outlining the rational for such use, C/I and side effects.
- Pharmacological approaches to contraception, side effects, precautions during use and C/I.
- Uterine relaxants, and uterine stimulants, indications, side effects, C/I
- Hormones of adrenal cortex, their synthetic analogues, pharmacological actions, therapeutic uses, precautions, side effects and contraindications. Hormones and drugs affecting calcium metabolism, therapeutic indications, contraindications and side effects
- Drugs used in the treatment of infertility (self-study)

10. Chemotherapy

17 hours

- General principals of chemotherapy, rational use of antimicrobial agents, indications for prophylactic and combined uses of antimicrobials including pre and probiotics
- Chemotherapeutic agents: penicillins, cephalosporins, aminoglycosides, broad spectrum antimicrobial agents, quinolones, sulphonamides macrolides and other newer drugs: their mechanism of actions, s/e, indications, resistance, and drug interactions. Drugs used for the treatment and prevention of infections – examples Tuberculosis, Leprosy, Malaria, Amoebiasis and other Protozoal infections, Fungal infections, Viral infections including HIV, STD, Helminthiasis, Leptospirosis etc.
- Antiseptics, disinfectants and their use based on their pharmacological properties. (Seminar) Anticancer drugs, mechanism of action, indications, s/e, C/I, Precautions, Pharmaco-economics.

Toxicology

General principles of treatment of poisoning

Management of overdose with commonly used therapeutic agents

Heavy metal poisoning and heavy metal antagonists (seminar)

Miscellaneous

Vaccines (self-study)

Drugs modulating Immune system (seminar)

Vitamins, Nutritional supplement (self study)

Gene therapy (seminar)

Drugs acting on skin & mucus membrane (seminar)

Sports medicine (self-Study)

Antioxidants (self-Study)

Part II (Clinical Pharmacology and Therapeutics)

National Health programmes like:

1. Tuberculosis
2. Leprosy
3. HIV
4. Malaria
5. Syphilis and gonorrhea & STD (seminar)
6. Upper and lower respiratory infections;
7. OCP
8. Filariasis
9. Anaemia
10. Diabetes Mellitus

Rationale, regimen, prescription of the medicines and regimens used for national programs, basic counseling in these scenarios .

Infective/Parasitic conditions

1. Influenza
2. Urinary Tract infections (seminar)
3. Typhoid and other GIT infections
4. Amoebiasis
5. Worm infestations (seminar)
6. Fungal infections
7. Herpes and Hepatitis, other antivirals

Medical emergencies , Managing a Pain crisis

1. Acute myocardial infarction, acute angina attack, circulatory failure, sudden cardiac arrest, hypertensive emergencies
2. Acute anaphylaxis and other acute allergic states
3. Snake bites and insect bites

4. Acute poisoning and drug overdose
5. Status epilepticus, febrile convulsions, acute mania
6. Acute severe asthma, acute rheumatic fever, acute gout
7. Acute colicky pains-intestinal, biliary, renal
8. Post-partum haemorrhage, uterine inertia

Other topics

1. Treatment of pain , , Assessment, classification, management, Application of WHO Analgesics
– as a seminar
 2. Treatment of insomnia
 3. Treatment of cough
 4. Treatment of fever of unknown origin (PUO)
 5. Drugs used in labour
 6. IV fluids
 7. Clinical uses of glucocorticoids
 8. P-drug or how to select a drug for a given patient in a given situation
 9. Essential drugs
 10. Drug therapy in special situations (pregnancy, lactation, children, geriatrics, renal and hepatic diseases)
- #### **Details of Practicals**
1. Dosage forms Oral, Parenteral, Topical & Others
 2. Routes of drug administration, setting up an intravenous drip
 3. Calculation of drug dosage
 4. Sources of drug information-how to retrieve information
 5. ADR monitoring
 6. Critical appraisal of drug promotional literature
 7. Essentials of Clinical trials
 8. Communicating to patients on the proper use of medication.
 9. Prescription writing, prescription auditing based on rational drug use and FDC
 10. Essential drugs list , National List of Essential drugs for India – adults, children and why are those particular drugs included. Controlled drugs amongst the essential list and their availability.
 11. Use of drugs in pregnancy, lactation, children and elderly
 12. Use of drugs in liver disease and renal disease
 13. Preparation of percentage solution
 14. Preparation and use of oral rehydration solution
 15. Informed Consent Form (To teach it more as a document of good communication, trust and shared planning for care than as a legal requirement.)
 16. Computer assisted learning (CAL)
 17. Experimental pharmacology charts interpretation
 18. Drug/drug and Drug/Food interaction.
 19. Selection of P-drug
 20. Irrational drug combinations, fallacies of using pre-combined drugs

Teaching-Learning methods:

Small group discussions, tutorials, project work and seminars. An overlap between theory and practical classes will serve to reinforce and complement the two. Points not covered in theory can be covered during practical classes.

Project work

Each student has to collect data of one clinical case and write it down as project. Topics for Seminars (2 hours each)

1. Antianaemic drugs
2. Antitussives
3. Shock
4. Alzheimer's disease and cognitive enhancers, neurodegenerative disorders.
5. Anthelmintics
6. Calcium metabolism
7. Dermatology – drugs acting on skin and mucous membrane
8. UTI & STD
9. Irritable bowel syndrome, ulcerative colitis & Eye disorders
10. Immuno Pharmacology
11. Laxatives and antidiarrhoeals
12. Alcohol
13. Osteoporosis, obesity, genetherapy
14. Heavy metal poisoning and heavy metal antagonists
15. Antiseptics
16. Superinfection, prophylactic use and misuse of antibiotics
17. Using analgesics in patients with poor renal function
18. Management of infections which are to be cared for without antibiotics – diarrhoeas, URTI, Uro-genital

Topics for self-study

1. Treatment of rhinitis
2. Carminatives, digestants & antiflatulents
3. Vitamins and antioxidants
4. Vaccines
5. Drug induced blood dyscrasias
6. Treatment of vertigo
7. Other protozoal infections
8. Drugs in pregnancy and infants.
9. NO, VIP
10. Drugs of addiction
11. Drug treatment of peripheral vascular disease
12. Anterior pituitary hormones
13. Drugs used in the treatment of infertility

14. Reactive oxygen species
15. Speciality based prescriptions and the resultant Polypharmacy – the new healthcare issue

Recommended books for undergraduates

1. Essentials of Medical Pharmacology by K.D.Tripathi (Prescribed)
2. Medical Pharmacology 3rd edition by Dr Padmaja Udaykumar (Prescribed)
3. Principles of Pharmacology by H.L.Sharma, K.K.Sharma (Prescribed)
4. Pharmacology and Pharmacotherapeutics. R.S Sathoskar and Bhandarkar (Prescribed)
5. Basic and Clinical Pharmacology Lange publications by Bertram G Katzung (Reference)
6. Pharmacology by HP Rang. M M Dale, J.M Ritter, P.K.Morore (reference)
7. The Pharmacological Basis of Therapeutics by Goodman & Gilman (reference)

Evaluation

Internal Assessment – 3 sessional examinations

One exam for theory at the end of each semester

The last sessional exam will be model examination (as per University pattern) – theory, Practical and viva voce

Internal assessment for theory = 15 marks

Internal Assessment is calculated with following break up

Final theory -Paper I and Paper II = 80 marks

Seminar presentation and post-test = 20 marks

Project = 10 marks

Viva voce = 20 marks

Best of first two theory exams out of (n-1) = 20 marks

Total = 150 marks

Internal assessment for theory = $150 / 10 = 15$ marks

Internal assessment for practicals = 15 marks

Record = 5 marks

Practicals = 25marks

Total $25+5= 30 / 2= 15$ marks

University examinations marks break up are

Theory -two papers of 40 marks each - 80 marks

Practical - 25 marks

Viva voce - 15 marks

Internal assessment

(Theory-15; practical 15) - 30 marks

Total - 150 marks

Pattern of Theory paper for final sessional exam and university exam

There will be 2 papers of 40 marks each. No division of question papers into section A and section B

Duration is 2 hours/ paper

Paper I

(Topics: General Pharmacology, ANS, CVS, blood, diuretics, CNS, autacoids, Respiratory System)

- I. Clinical Problem (1) = 5 marks
- II. Structured essay questions (1) = 5 marks
- III. Short notes (4 x3 = 12 marks)
- IV. Give reasons for the following (5 x1 = 5)
- V. Give two uses and two adverse effects specific to the drug (4 x1= 4)
- VI. Choose the drug and justify (5 x 1 = 5)
- VII. Name two drugs ($\frac{1}{2}$ x 8 = 4)

Paper II

(Topics: GIT, Hormones, antibiotics, chemotherapy and miscellaneous)

- I. Clinical problem (1) = 5 marks
- II. Structured essay questions (1) = 5 marks
- III. Short notes (4 x3 = 12 marks)
- IV. Give reasons for the following (5 x1 = 5)
- V. Specify the mechanism of action of the following drugs (3 x1 = 3)
- VI. Specify the spectrum (highly susceptible organism) for the following agents (2x1=2)
- VII. Give two uses and two adverse effects specific to the drug (4 x1= 4)
- VIII. Name two drugs ($\frac{1}{2}$ x 8 = 4)

Practicals

Total marks = 25 marks

Practical I -Objective Structured Practical Examination (OSPE)

Response stations -10

Time at each station is 5 minutes.

- 1.Prescription writing for prescription for common ailments -1 = 2marks
2. Prescription for special groups – pregnant woman, children, elderly and patients with renal or hepatic disease) -1 = 2 marks
- 3.Exercise on Drug interaction – 1 = 2 marks
- 4.Drug dosage calculation -1 = 1 mark
- 5.Dosage forms -1 = 1 mark
- 6.Drugs -3 nos from different: groups = 3 marks
- 7.Device -1 = 1 mark
- 8.Diagram/Picture of plants or ADR-1 = 1 mark
9. Calculation of percentage solutions (normal saline, 5% dextrose/half normal saline/others) /ORS procedure) -1 = 1 mark
- 10.Sources of drug information– 1 = 1 mark

Total = 15 marks

Practical II- (Interactive sessions)

1. Clinical Pharmacology chart – 1 = 2 marks
2. Interpretation of experimental chart -1 = 3 marks
3. Interpretation of data (providing lab: reports) -1 = 1 mark
4. Criticize and rewrite informed consent form – 1 = 3 marks
5. ADR (clinical problem) -1 = 1 mark

OR

6. Give an irrational prescription with wrong dosage, wrong route, wrong frequency and inadequate supportive drugs. Exercise to correct the mistakes and form a rational prescription -1=3marks

OR

7. Demonstrate route of administration (loading syringe, cleaning, different routes IM.IV.SC etc) or demonstrate use of Inhaler or use of eye drops, OC etc)
-1= 3 marks

Total = 10marks

VIVA VOCE

Total 4 stations each student to be examined by all the four examiners Total 15 marks

COMMUNITY MEDICINE

A. VISION

To develop a group of medical graduate who will be proactive in identifying and responding to public health challenges the society is facing.

B. MISSION

To bring out a group of Medical Graduates who can practice the science of medicine with Social responsibility and social accountability and provide cost effective, value based comprehensive health care.

C. GOAL

To equip the students to function efficiently and effectively as first level physicians in the community in accordance with the committed vision and mission of community medicine.

D. DEPARTMENTAL OBJECTIVES

D.1. GENERAL OBJECTIVE

To train Medical Students with knowledge, attitude and skills required to become doctors with empathy, and, who can effectively function as healthcare providers, decision makers, communicators, community leaders and managers in rural and urban settings.

D.2. SPECIFIC OBJECTIVES

D.2.1. KNOWLEDGE

1. To identify the multi-factorial determinants & dimensions of health and disease, dynamics of community behaviours and human society
2. To understand the structure and process of the health care delivery system

3. To identify the health needs of the community in general and vulnerable groups in particular
4. To understand the science of applied epidemiology and biostatistics and describe their application to health and disease in the community or hospital situation
5. To understand the environmental and occupational factors in health and disease
6. To identify the role of nutritional factors in health and science
7. To understand the concept of heredity and inheritance in relation to individual and community health
8. To understand the objectives, strategy, implementation monitoring and evaluation of all National Health Programmes (NHP)
9. To understand the population dynamics and their impact on health and disease
10. To enumerate the principles and components of primary health care and national health and related policies to achieve millennium development goals (MDG)
11. To understand the principles and techniques in health management and health economics
12. To understand the social dynamics and social factors in relation to health and disease
13. To understand the Gender issues in health and diseases
14. To understand the Developmental Health Interface & health of populations.

D.2.2. ATTITUDE

1. To see “the human being in disease, “not the disease in Human being” and provide health care in an environment of care and compassion
2. To safe guard human dignity, equity and solidarity adhering to professional ethics.
3. To acknowledge and respect the differences in the needs, values and cultures of different communities.
4. To assume social responsibilities at all times and take initiative in times of natural disasters, calamities and accidents.
5. Readiness to work in rural, tribal, urban slum areas and other constrained situations where services are most needed.

D.2.3. SKILLS

1. To diagnose and manage common health problems and emergencies using drugs rationally.
2. To identify community Health problems, prioritize them and chalk out solutions with local resources and community participation.
3. To deliver evidence based, need oriented, primary health care in a competent manner in diverse settings.
4. To work effectively as a health care team member with the community hand in hand with various sectors to bring about health promotion.
5. Use epidemiology and biostatistics as scientific tools to study the phenomenon of

health and disease and make rational decisions relevant to community and hospital situation.

6. To collect, compile, analyze and interpret health related data for disease surveillance and health promotion initiatives.
7. To communicate effectively and appropriately with people at large and patients and their families in particular
8. To impart health education using appropriate tools and educational methods with special reference to national health issues.
9. To implement, monitor and evaluate National Health Programmes.
10. Be capable of syntheses between cause and illness in the environment of community and individual health, and respond with leadership qualities to institute remedial measures for these.
11. To manage human resources, money, material, time and information required for delivering health care

D.3. INTEGRATION

Horizontal as well as vertical integrated teaching are conducted with in-house sister departments and extramural organizations (Government and non-Government) which are involved in the delivery of primary health care, implementation of National Health Programmes and/or running social welfare institutions.

Course Details

Duration of the course - First Semester, Third to Seventh semesters (330 hours)

Lectures - 130 hours –(Phase I – 30 hours, Phase II – 100 hours)

Practicals - First phase- 30 hours

Second phase-170 hours

COURSE CONTENTS

I. CONCEPT OF HEALTH & DISEASE

- 1 Definition, concepts & evolution (history) of Public Health
- 2 Definition of health, holistic concepts of health including the concept of spiritual health, appreciation of health as a relative concept, dimensions & determinants of health.
 - Disease as an experience - Patient as a person with physical, emotional, psycho-social and spiritual concerns
 - How to recognize the role of patient-family unit as important in healthcare inputs
 - Quality of Life - What does quality of life mean? Examples of it being subjective
 - Subjectivity of symptoms - example pain

3	Characteristics of agent, host and environmental factors in health and disease and the multi factorial etiology of disease.
4	Understanding the concept of prevention & control of disease.
5	Understanding the natural history of disease and application of interventions at various levels of preventions
6	Introduction to various health indicators
7	Health profile of India-already in Chapter XIV
II	SOCIAL AND BEHAVIORAL SCIENCES
1	Concept of Sociology& Behavioral Science, Clinico-socio-cultural and demographic evaluation of the individual, family and community.
2	A ssessment of barriers to good health and health seeking behavior
3	Role of family in Health and Disease
4	Socio-cultural factors related to health and disease in the context of urban and rural societies
5	Assessment of socio-economic status, effect of health and illness on socio economic status
6	Doctor-patient relationship
7	Social Psychology, Community Behavior and community relationship, hospital sociology and psychology
8	Social security-Health Insurance: Organized sector, unorganized sector, special groups (Eg: elderly)
9	Impact of urbanization on health and disease-will be covered in chapter XIII
10	Poverty link to health and disease and poverty alleviation programmes Household Poverty in India caused by Healthcare expenditure. Current status of Health Insurance in India
11	Intelligence – IQ and EQ
12	Personality – Types, Interpersonal relationships

- 13 Attitude, Behaviour, habits
- 14 Emotions, Frustrations, role of emotions in health & coping with emotions
- 15 Conflicts-internal, interpersonal & conflict resolutions, defence mechanisms
- 16 Stress & coping skills – integrated (Psychiatry)

17	Ethics Confidentiality, Autonomy, Privacy, Human rights aspects of patient care
18	Learning – Types and skills
19	Development & Health interface-Poverty & Health, Health of the marginalized, Sustainable & inclusive development
20	Gender & Health including gender based violence, Epidemiology of violence and its prevention and control Life skill education
III	ENVIRONMENT AND HEALTH
1	Water: Concepts of safe and wholesome water, sanitary sources of waterborne diseases, water purification process. Water quality standards.
2	Physical, Chemical & bacteriological standards of drinking water quality and tests of assessing bacteriological quality of water.
3	Health hazards of air, water, noise, radiation pollution.
4	Concepts of water conservation, rainwater harvesting & Global warming.
5	Concepts of solid waste, human excreta and sewage disposal.
6	Awareness of standards of housing and his effect of housing on health.
7	Role of vectors in the causation of diseases.
8	Identifying the features of vectors and their control measures.
9	Life cycles of vectors and advantages and limitations of various vector control measures.
10	Mode of action, application cycle of commonly used insecticides and rodenticides.
11	Urban waste management.
12	Recent and emerging issues in environmental health a Stockholm b. Basel convention c. Kyoto Protocol. etc
13	Radiation Prevention and Control
14	Newer methods of solid & liquid waste disposal • Composting • Solar (Renewable source of energy) • e-waste

C NGE. (INFORMATION, EDUCATION, COMMUNICATION)

IV. HEALTH PROMOTION AND EDUCATION/COMMUNICATION OR BEHAVIOURAL CHANGE. (INFORMATION, EDUCATION, COMMUNICATION) ----

- a. Understand the concepts of health Promotion and education, IEC, Behavioural change communication, Counselling
- b. Principles & methods of health promotion and education.
- c. Barriers of effective communication and methods to overcome them.
- d. Various methods of Health education with their advantages and limitations.
- e. Organizing health promotion and education activities at individual, family and community settings.
- f. Evaluation of health promotion and education programme.

V. NUTRITION

- 1 Common sources of various nutrients and special nutritional requirements according to age, sex, activity, physiological conditions

Real life knowledge on which Indian dietary component, fruits, vegetables, grains, grams have high sodium, high potassium, high fiber, high protein

Introduction to current evidence on health impact of red meat, refined oil, white sugar, caffeine containing soft drinks, artificial tastes, flavours, dairy products, GM foods,

- 2 Nutritional assessment of individual families and the community by using appropriate method such as; anthropometrics, clinical examination 24 hour dietary recall and other methods of diet survey etc.
- 3 Plan and recommend a suitable diet for the individual and families as per local availability of food and economics status etc.
- 4 Common nutrition related health disorders (like protein energy, malnutrition, obesity, childhood obesity, Vitamin A deficiency, anaemia, iodine deficiency, fluorosis, food toxin diseases) and their control and management.
- 5 Food fortification, additives and adulteration food hygiene.
- 6 Social and cultural factors in nutrition and Health.
- 7 Important National nutritional programmes.
- 8 National Nutrition policy.
- 9 Nutritional surveillance, education and rehabilitation.
- 10 New WHO Growth Charts.
- 11 Principles of Therapeutic Diet
12. Food plate

VI. OCCUPATIONAL HEALTH

- 1 Relate the history of symptoms with specific occupations including agricultural related

- occupation.
- 2 Employees State Insurance Act.
- 3. Specific occupational health hazards, their risk factors and its preventive measures.
Primary Secondary and tertiary prevention including personal protective devices
- 4. Concepts of ergonomics.
- 5. Diagnostic criteria of various occupational related diseases.
- 6 Other legislations related to occupational health.
- 7 Digital Health Computer associated Illness.
- 8 Occupational health in unorganized sector
- 9 Integrated learning on non-pharmacological management of pain Visit to
PMR department

VII. BIO-STATISTICS

- a. Collection, Classification, analysis, interpretation and presentation of statistical data.
- b. Application of Statistical methods in various study designs.
- c. Common sampling techniques, simple statistical methods, frequency distribution, measures of central tendency and dispersion.
- d. Apply common tests of significance in various study designs

VIII. BASIC EPIDEMIOLOGY

- 1 Epidemiology: definition, concepts, uses and its role in health and diseases.
- 2 Use of basic epidemiological tools to make a community diagnosis of the health situation, in order to formulate appropriate intervention measures.
- 3. Definition of the terms used in describing diseases transmission and control.
- 4 Modes of transmission and measures for prevention and control of communicable and non-communicable diseases.
- 5 General Principles of prevention and control of communicable, non communicable diseases and other health conditions of public health importance.
- 6 Principle Sources of Epidemiological data.
- 7 Definition, Calculation and interpretation of morbidity and mortality indicators standardization (Direct & Indirect)
- 8 Screening of health related attributes & issues need, uses and evaluation of screening tests.
- 9 Investigation of an epidemic of communicable disease and to understand the principals of control measures.
- 10 Epidemiological study design & Research Methodologies
- 11 Concepts of association, Causation and biases
- 12 Application of computers in epidemiology
- 13 Use of principles of epidemiology in practice of medicine
- 14 Introduction to Evidence based medicine
- 15 Use of diagnostic tests

IX.EPIDEMIOLOGY OF SPECIFIC DISEASES: COMMUNICABLE & NON COMMUNICABLE

Communicable and non-communicable diseases of public health importance, relevant to the region, for which National Disease control/Eradication Programmes have been formulated.

Communicable Diseases: Intestinal infections: Poliomyelitis, Viral hepatitis, Diarrhoea, Cholera, Helminthiasis, typhoid, Amoebiasis & Giardiasis, Food Poisoning.
Respiratory Infections: Acute Respiratory infections, Measles, Diphtheria, Whooping cough, Tuberculosis, SARS, Influenza, Meningococcal meningitis, Mumps.
Vector borne infections: Malaria, Filariasis, KalaAzar, Dengue, Yellow Fever, Chikungunya fever. Surface infections:
Sexually transmitted diseases, Syndromic approach, HIV & AIDS, Tetanus, Leprosy, scabies, Pediculosis. Zoonosis: Rabies, Japanese encephalitis, Plague, Kyasanur Forest Disease, Leptospirosis, Anthrax.
Hospital Acquired Infections
New Emerging Diseases
Zika Virus, Ebola Virus
Investigation of food poisoning outbreak

Non Communicable Lifestyle Diseases: Coronary heart diseases, Hypertension, Stroke, Rheumatic heart disease, Cancers, Obesity, Diabetes, Blindness, Injury and Accidents.

- 1 Extent of problem, epidemiology and natural history of diseases
- 2 Public health importance of particular diseases in local area.
- 3 Influence of social, cultural and ecological factors on the epidemiology of particular diseases
- 4 Diagnosing diseases by clinical methods, using essential laboratory techniques at primary care level.
- 5 Treatment of a case, as per National programme guidelines, and also follow up of case
- 6 National health programme for health diseases.
- 7 Understand the principles of measures to control a diseases epidemic
- 8 Principles of planning, implementing and evaluating control measures for diseases at community level bearing in mind the public health importance of the diseases.
- 9 Training of health workers in diseases surveillance, control and treatment, health education.
- 10 Management information system in a particular diseases
- 11 Prevention and control of new emerging diseases and life style related health problems.
- 12 International classification of diseases.

X. DEMOGRAPHY AND VITAL STATISTICS

- 1 Concepts of demography, demographic cycle, Vital Statistics.
- 2 Definition, Calculation and interpretation of demographic indices like birth rate, death rate, fertility rates.

- 3 Population dynamics of India.
4. Population control measures. Family planning methods including NSV and emergency contraception
5. National population Policy.
6. Sources of Vital Statistics like census, SRS NFHS, NSSO etc.

XI. REPRODUCTIVE AND CHILD HEALTH

1. Current statistics of reproductive and child health.
2. Screening of high risk groups and common health problems.
3. Local customs and practices during pregnancy, child birth, **lactation and** child feeding practices.
4. IYCF (Infant and young child feeding practices)
- 5.
6. Organization , implementation and evaluation of reproductive child health (RCH)
7. components, including child survival and safe motherhood(CSSM), Universal immunization Programme(UIP), Integrated child development services scheme (ICDS), integrated management of Neonatal and childhood illness (IMNCI), Janani Suresh Yojna (JSY)& Accredited Social Health Activist (Asha) under national rural health mission(NRHM) and other existing Programmes.
6. Various Family Planning methods, their advantages and Shortcomings.
7. Medical Termination of Pregnancy and Act(MTP Act) & Pre Natal Diagnostic Test Act (PNDT Act)
8. Adolescent Health
9. Handicapped Child. Community based Rehabilitation
10. Organizations, technical and operational aspects of the National family welfare Programme.
11. MCTS(Mother and Child Tracking System)

XII. SCHOOL HEALTH

1. Objectives and components of school Health programme
 - a. Periodic Medical Examination of the children and the teachers
 - b. Immunization of the children in the school.
 - c. Health promotion and education
 - d. Mid-day meals.
 - e. WIFS(Weekly Iron and Folic Acid)

XIII. URBAN HEALTH

1. Common health problems (Medical, Social, environmental, Economical, Psychological) due to Urbanization of Urban Slum dwellers
2. Organization of health services in urban slums
3. National policy on urban health.

XIV. HEALTH CARE SYSTEM IN INDIA

1. Concepts of Primary Health care and Comprehensive Health care.
2. Health profile of India
3. Health Care Delivery System in India and Infrastructure at peripheral, Primary, Secondary and tertiary care level
4. Job responsibilities of different category of workers in health System
5. Voluntary Health agencies working in India.

XV. HEALTH PLANNING, MANAGEMENT AND ADMINISTRATION

1. Concepts of Planning, Management, Public Health administration. Seminar on India's National Policy – NPCDCS, elderly health, mental health and on Palliative Care
2. Components of health planning activity.
3. Classification and Understanding of various qualitative and quantitative Health management techniques.
4. Overview of administration at village, block, district, state and central level in India.
5. Integrated Disease Surveillance Project (IDSP)
6. Health Related Millennium Development Goals and sustainable development goals
7. National health Policy & National Rural Health Mission (NRHM)
8. Concepts of Health Economics + Health Planning and management.
9. Concepts, Scope and methods of Health Audit.
10. Role of Planning Commissions and Five year plan in development of health sector in India
11. Various health committees of government of India and their important recommendations
12. Decentralization and PRI Institutions.
13. Inventory Control

XVI. DISASTER MANAGEMENT

1. Principles of disaster preparedness and application of these in disaster management.
2. Bio-terrorism
3. Pandemic Preparedness

XVII. LEGISLATION AND PUBLIC HEALTH

(Recent Amendments to be included)

1. Census act 1948
2. Registration of Birth and Death Act 1969
3. The Epidemic Diseases Act, 1897.
4. The Transplantation of Human Organs Act, 1994
5. The prevention of food Adulteration Act 1954(FSSAI)

6. The International Health Regulations
7. The Cigarettes and Other Tobacco product Act 2003
8. The Narcotic and Psychotropic substance Act 1958
9. The Medical Termination of Pregnancy Act 1971 (MTP Act)
10. The Dowry Prohibition Act
11. The Immoral Traffic (Prevention) Act 1956
12. The Prenatal Diagnostic Techniques (Regulation and Prevention of Misuse) Act 1994
13. The Juvenile Justice Act 2000
14. Child Labour (Prohibition and Regulation) Act 1986
15. The Persons with Disabilities (Equal opportunity, Protection of rights and full participation) Act 1995
16. The Factories Act 1948
17. The Employees State Insurance Act 1948
18. The Environment (Protection) Act 1986
19. The Bio-Medical Waste (Management and Handling) Rules 2000
20. The Consumer Protection Act 1986

XIX. INTERNATIONAL HEALTH

1. Role of various multilateral, bilateral international health organizations like WHO, UNICEF etc.
 - . WHO Resolutions – on Non-communicable diseases, palliative care
 - . Sustainable Development Goals as relevant to India
2. Organizational structure of these organizations
3. New International health Regulation (IHR)

XX. HEALTH CARE WASTE MANAGEMENT

1. Classification/Category, sources, health hazards and treatment of Bio-Medical Waste.
2. Application of these principles in different setting of health care delivery system.
3. Safe Injection Practices
4. Universal Precautions

XVIII. HEALTH CARE OF ELDERLY

National Policy

1. Health problems of Aged
2. Preventive Geriatrics – Prevention of falls
3. Care of Aged

XIX. MENTAL HEALTH AND BEHAVIORAL PROBLEMS

1. Importance of mental health care in primary care settings.
2. Comprehensive Mental Health Care at primary care settings.
3. Common Mental Health disorders.

4. Substance use disorders Tobacco, Alcoholism and Drug Addiction- and prevention
5. Gender Issues and Women Empowerment
6. Gender Based Violence, Domestic Violence, Epidemiology Prevention and Control
7. Suicides

XX. DEVELOPMENT AND HEALTH INTERFACE

- 1) Poverty and Health (Evidence based learning – to show real data)
- 2) Poverty and Health
- 3) Poverty Alleviation Programme
- 4) Health of the marginalized –eg. Transgender, Tribals
- 5) Sustainable and inclusive Development
- 6) . Universal health Concept in India, Sustainable Development Goals

XXI. GENETICS

1. Epidemiology of Genetic Diseases
3. Screening of Genetic Diseases
4. Prevention and Control of genetic Diseases

XXII. DISABILITY

1. Types of Disability

Paraplegia/ Quadriplegia – as a seminar – prevention, and care of those who have irreversible paraplegia

Physical, emotional concerns and management

Assisting in Economic self sufficiency – as a social health concern of the doctor

Role of Medical Social Workers

– working as Multi disciplinary Team for total care

2. Rehabilitation-- Clinical and community level.

3. Palliative Care

Concept, need in the country, relevance Applicability in chronic disease

Concept of Non-abandonment if disease is not curable

- 2 levels – Palliative care Approach, generalist Palliative Care, Specialist Palliative Care

-Where, How Palliative Care is to be delivered

Concept of Home based care

SKILLS

The student should be able to do:

1. Elicit Clinico-social history. Describe agent , host and environmental factors in determining health and disease.
2. Identify, prioritize and manage common health problems of community.
3. Apply elementary principles of epidemiology in carrying out simple epidemiological studies.
4. Work as a team member in rendering health care.
5. Carry out health promotion and education effectively in the community.

Skills in relation to specific topics

1. Communication:

Should be well versed with the art of interviewing techniques to elicit the desired information

& with art of counseling to counsel. The student should be able to communicate effectively with family members at home, patients at clinics or at home; and community. The student should also be able to communicate with individuals, family or a group for health promotion and education, and also with peers.

- Basic Communication Skills
- Importance of good communication skills
- Barriers – for the Patient and for the doctor
- Active listening
- Basic Clinical communication skills
- Examples of good and poor communication as Role Play - affecting diagnosis and management

In 3rd Professional Year

- The stepwise breaking of Bad News

Handling Collusion

2. Team Activity

Work as an effective member of the team; in planning and carrying out field work like school health, conduct health camps ,investigation of epidemic etc.

3. Environmental Sanitation:

Able to assess environmental risk factors plan and suggest action
Able to collect water and stool samples for microbiological analysis

Able to identify insects of public health importance, able to use effective insecticides.

Purification of water-small scale.

Vector Survey and control measures.

Newer methods of solid & liquid waste disposal

- Composting
- Solar (Renewable source of energy)
- e-waste

4. Communicable and Non-Communicable disease.

- Eliciting Clinico-social history and examining the patients for diagnosis and treatment.
- Assessing the severity and /or classifying dehydration in diarrhea, upper respiratory tract infection, dog bite, leprosy, classify tuberculosis (Categorization) and STD.
- Fixing, Staining and examining peripheral smear for malaria, sputum for AFB, hemoglobin estimation, urine and stool examination.
- Adequate and appropriate treatment and follow up of public health diseases and of locally endemic diseases. (The Integrated Care Model of WHO for chronic conditions – 5 As – Assess, Advice, Agree, Assist, Arrange)
- Advice regarding prevention and prophylaxis against common and locally endemic diseases.
- Use of proper screening methods in early diagnosis of certain diseases, applicable at primary care level.
- Able to detect outbreak in early stage, spot mapping, investigation of outbreak, notification of notifiable diseases.
- Surveillance skills development, calculating various health indicators and their interpretations.

5. Reproductive and Child Health:

- Antenatal-examination of women, application of at risk approach in antenatal care.
- Intranatal care –conducting a normal delivery, referral indications.
- Postnatal –assessment of new-born and mother, promotion of breast feeding, advice on weaning and family planning.
 - Preventive oncology in women and barriers
- Immunization-able to immunize the eligible using desired routes, for providing vaccines.
 - Adverse Event Reporting
- Contraception-able to advice appropriate method.
- Able to insert any Intra Uterine Device (IUD) Condom demonstration.

6. Statistics:

- Able to draw sample using simple sampling techniques.
- Apply appropriate test of significance.
- Calculation of various health indicators and presentation of data

7. Nutrition:

Conduct complete nutritional assessment of individual using clinical, anthropometric and diet survey tools.

Ability to use and interpret road to health card.

Advise appropriate balance diet and suggest any dietary modification.

Nutritional promotion and education to specific groups and related to specific nutritional diseases.

Prescribe a therapeutic diet.

8. Occupational health:

Screening of workers for any occupation related health problem.

9. Managerial Skills:

Able to make community diagnosis and take remedial measure for improving health of community.

Organize antenatal, under five clinics, health education camps.

Ability to manage Health Management Information System, including maintenance of health records at primary care level.

Able to show effective leadership, supervision skill not only at primary care level but also in inter-sect oral coordination.

Ability to manage money, material and manpower at primary care level.

Ability to do cost effective analysis as per primary care needs. Ability to implement cost containment measures in public health

Community Participation and cooperation skills. Community engagement, community ownership for effective health care – models in India – in preventive health, in self –help healthcare initiatives

10. Basic Laboratory investigation at primary care level

Hemoglobin estimation

Urine examination for normal and abnormal constituents.

Thick and thin blood smear for malaria parasite examination

Peripheral smear for type of anemia

Acid fast staining

Estimation of chlorine demand and residual chlorine.

Identification of life cycle stages of various insects of public health importance

11. Minor surgical procedures at primary care level

All type of injection techniques

Universal precautions and safe injection practices (use of AD syringes)

Common wound dressings

Incision and Drainage of abscess under local anesthesia.

Suturing of wounds

12. First Aid, Initiation of emergency care, Triage and referral

13. Transportation of injured and seriously ill patients from site of first contact.

14. Participatory Rural appraisal

Social Mapping

Focus group Discussion

Key informant Interview. . Local self governance bodies, Village Health, Sanitation, Nutrition committees, recognizing local resources – dais, elders, ASHA workers, teachers, postman [who knows to read things out]

15. Health Education

Health Education to various groups (individual and group Assignments).

16. Animal bite Management.

E. DETAILS OF INTERACTIVE LECTURES

TOPICS

1. Introduction

Objectives of Medical education need for value based medical education history of medicine with reference to community medicine

Concept of Health

Concept of Diseases

Concept of control & prevention

Learning –Type & skills-How to learn effectively

Intelligence-IQ, EQ

Personality-Type interpersonal relationships

Attitude, Behaviour, Habits

Emotions, Frustrations, role of emotions in health & coping with emotions - 1hr

Conflicts-internal, Interpersonal & conflict resolutions, defence mechanisms - 1hr

Stress & coping skills-Integrated (psychiatry). Burn out and self care
Ethics
Gender Health Including Gender Based Violence
Life Skill Education

2. Epidemiology

Epidemiology-Introduction, tools & Measures of
Mortality Standardization Direct & Indirect Measures
of Morbidity
Descriptive studies
Case control studies Cohort
studies Experimental studies
Association & Causation
Application of epidemiology
Screening for diseases
Infectious Diseases Epidemiology_ concepts
Dynamics of Diseases Transmission & Concepts of prevention & control
Investigation of an epidemic (integrated with Microbiology, Health services)
Introduction to Evidence based medicine/evidence pyramid in day today practice
Use of diagnostic tests

3. Communicable Diseases

Smallpox & Chicken pox
Measles, Mumps, Rubella
Diphtheria, pertussis, Meningococcal meningitis
ARI & ARI control Programme
TB-Epidemiology & Control
Poliomyelitis
Viral hepatitis
Typhoid fever, Cholera & ADD
Food poisoning & Food toxicants
Dengue fever, Chikungunya, Malaria
Filaria
Rabies
JE & KFD
Leptospirosis
Plague and Yellow fever
Leprosy
Trachoma & tetanus
STD-Syndromic approach
AIDS
Emerging & Re-emerging infections
Hospital acquired infections & Health Care Waste Management

Non Communicable Diseases

Coronary Heart Diseases & Rheumatic Heart Diseases

Hypertension & stroke

Cancers

Prevalence of Advanced cancer in the community and their needs

Diabetes mellitus & obesity

Blindness & control Programme

Accidents (Integrated)

Non-abandonment when disease is progressive

4. Demography & Family Planning

Demographic cycle, Trends & National population Policy

Family Planning Methods Including Non scalpel

Vasectomy, Emergency Contraception and MTP Act

5. Maternal and Child Health

Maternal health-ante, intra, postnatal care & problem (Integration with O &G)

Growth & Development/Growth Charts, WHO Growth Chart (Integration with Paediatrics)

Behavioural problems & Juvenile Delinquency

Indicators of MCH Care

Geriatric problems (Size, need for special care, National policy of elderly)

Special presentation of ailments, common issues and integrated care – rather than multi-speciality approach to care

Challenges of Poly pharmacy

Adolescent problems

6. Nutrition

PEM& Child hood obesity

Nutritional requirements-RDA-integrated (Biochemistry)

Nutritional Disorders-integrated (Biochemistry)

National Nutritional Programmes.

Nutritional status assessment & Surveillance

Ecology of malnutrition,

Food adulteration - PFA , FSSAI

7. Social science

Concepts in sociology ,

Family and cultural factors in Health & Diseases

Social problems-overview of Social security measures

8. Development and Health

Development and Health Interface

Poverty and health, poverty alleviation programmes
Health of Marginalized
Sustainable and Inclusive Development

9. Genetics

Epidemiology of Genetic Diseases
Screening of genetic diseases
Prevention and control of genetic disease

10. Mental and Behavioral Problems

Importance of mental health care in primary care settings
Comprehensive Mental Health Care at primary care settings.
Common Mental Health disorders.
Substance use disorder-Tobacco, Alcoholism and Drug addition

11. Gender and Health

Gender Issues and Women Empowerment
Gender Based violence, Domestic Violence -causes, Prevention and Control (Integrated Surgery, O&G, Legal and Police Department)

12. Environmental Health

- (1) Pollution- Air, Water and soil
- (2) Waste Disposal in urban & rural areas
- (3) Recent issues & advances in environmental health policies Eg. Basel Convention
Stockholm Convention
- (4) Emerging environmental health issues-eg: e- wastes

13. Occupational health

1. Occupational health problems
2. Prevention of occupational diseases and ergonomics

14. Communication process

Communication process, Types, barriers & Health Communication

- Reactions to loss and grief
- Respect; Being non-judgmental
- Basic Communication Skills

- Importance of good communication skills
- Barriers – for the Patient and for the doctor
- Active listening
- Basic Clinical communication skills

Examples of good and poor communication as Role Play - affecting diagnosis and management

Health education-Definition & Principles

15. Health Planning, Health System& Health economics

Health Planning & Planning Cycle

Health System& Health Care Delivery system

(Rural, urban, tribal) Health

Information system Health

committees

Concepts of health care-primary health care

Health care for all

National Health Policy, Millennium development goals

Seminar on India's National Health Policy – NPCDCS, elderly health, mental health and on Palliative Care

Universal health status in India

Sustainable Development Goals

Role of Voluntary agencies in Health, New International Health regulations Panchayati Raj

Management & Managerial Techniques

Health economics & cost containment issues health

care Disaster management, Pandemic preparedness

Bioterrorism

16. National Health Programmes

Revised National TB Control Programme

National Anti-Malaria Programme

National Filariasis Control Programme

(Mass Drug Administration & Morbidity Management)

National Vector borne disease control programme

National AIDS Control Programme

National Mental Health Programme & District Mental Health Programme

Evolution of Family Planning Programme & Reproductive & Child Health

17. Legislation and Public Health

1. Census act 1948
2. Registration of Birth and Death Act 1969
3. The Epidemic Diseases Act, 1897.
4. The Transplantation of Human Organs Act, 1994
5. The prevention of food Adulteration Act 1954(FSSAI)
6. The International Health Regulations
7. The Cigarettes and Other Tobacco product Act 2003
8. The Narcotic and Psychotropic substance Act 1958

Recent Amendment – 2014 – Purpose for the amendment, Current procedure for accessing essential narcotic drugs [ENDs]

9. The Medical Termination of Pregnancy Act 1971(MTP Act)
10. The Dowry Prohibition Act
11. The Immoral Traffic (Prevention) Act 1956
12. The Prenatal Diagnostic Techniques (Regulation and Prevention of Mis use) Act 1994
13. The Juvenile Justice Act 2000
14. Child Labour (Prohibition and Regulation) Act 1986
15. The Persons with Disabilities (Equal opportunity, Protection of rights and full participation) Act 1995
16. The Factories Act 1948
17. The Employees State Insurance Act 1948
18. The Environment (Protection) Act 1986
19. The Bio-Medical Waste (Management and Handling) Rules 2000
20. The Consumer Protection Act 1986

PRACTICALS/FIELD VISITS

Practical should offer first-hand experience in the community through visits, mock sessions and hands-on exercises. Visits may be planned based on public health importance, relevance and feasibility. For each visit objectives may be specified and orientation given prior to the visit. Five minutes may be allotted for presenting report of previous day's activities, learning experiences and suggestions. Integrated and interactive team teaching may be employed wherever possible.

Phase I

30hrs

Visit to community and families

Following up one family with a patient with chronic disease for 1 year with at least 3 home visits and recorded interaction with family members– and submit a structured case reflection at the end of 6th semester - under physical, emotional, socio-economic and

spiritual concerns of that patient/family unit. All this is done with assigned mentorship.

Reflection and practice points

Visit to support and auxiliary health facilities

Identify a community Health Problem

Introduction to the Hospital system

Hands-on exercise on first aid

Phase II

170 hrs

Family studies – Community diagnosis

Basic clinical skills training-history taking skills Innovative
community based problem solving exercises

Biostatistics-hands-on exercises- central
tendency/dispersion/sampling/hypothesis/significance tests

Community interaction, identification and solving community health problems with
community participation

Entomology including field assignments –vector survey/control measures

Epidemiological exercises – Mortality, Morbidity, Risk/ Screening, including study
designs and standardization

Visit to public health institutions

Visit to social welfare organizations

Accompanied by Medical Social Worker team member

Implementation of National Health Programmes through CHC/ PHC and sub centre visits

Visits to institutions of public Health importance

Pain & palliative care centre

Supervised home based care visits with the palliative care
team Vocational Rehabilitation Centre

Water works

Anganwadi

Analyst lab

De addiction centre

Food inspector's Office etc.

BCC (IEC) Strategies-individual & group
assignments Review of current health issues &
policies

Review of museum specimens, poster presentations

Participation in health related activities in the
community

Research methodology – Participation in workshop & Project work, computer skills, Nutrition
skills – Diet survey, balanced diet, Nutritional requirements, RDA, Nutritional disorders,
Community Nutrition programmes

Balanced diet and therapeutic diet

Food Hygiene

PFA act
Universal Precautions & Safe Injection Practices
Health Care Waste Management
Participatory techniques in health
Health Planning & Management exercises
Disinfection
Immunization agents & Immunity---Vaccines, Cold Chain
Hazards of immunization including adverse event reporting
Fertility related statistics and Family Planning methods, Growth charts
Art of Interviewing
Doctor-Patient relationship and Hospital sociology
Concept of therapeutic relationship

Rights and duties

Oath Sanitary well, well Chlorination Procedure
Purification of water – large and small scale
Water Quality Standards and surveillance
Sanitary Survey

METHODS OF ASSESSMENT

Modified essay question
Short answer questions
Problem solving exercises
OSCE, OSPE Epidemiological and statistical exercises
One Case reflection of a home bound patient's concerns and way forward evaluation
Analysis of ethical dilemmas of hospital based disease management – from clinical cases and approach to solving it

Actor patients – interviewing style, communication skills, Breaking bad news, Handling collusion

Records review
Research, Project Reports
Viva Voce

TEACHING LEARNING METHODS

Structured interactive sessions
Role play – for teaching good/ poor communication skills

Small Group discussion
Focus Group Discussion (FGD)
Participatory learning appraisal (PLA)

Institutional visits

Practicals including demonstrations

Problem based exercises

Video Clips

Written case scenario Self-learning tools. Choose movies with healthcare message

Interactive learning

E-modules

TIME OF EVALUATION

University examination of Community Medicine should be at the end of 7th Semester. Formative and summative assessment during internship so that we have a basic doctor, competent to provide comprehensive care.

LEARNING RESOURCE MATERIALS

Text books Reference books

Practical note books

Internet resources, Video films etc

SUGGESTED TOPICS FOR LEARNING THROUGH e-MODULES:

History of Medicine and Public Health

Environmental Health

Nutrition (Except public Health Nutritional Programme)

Epidemiological methods

Screening

Planning Cycle

Health management techniques

Entomology

Biostatistics

Demography

Disaster management

Biomedical waste management

International health

National Health Organizations

TOPICS FOR INTEGRATED TEACHING WITH DEPARTMENT OF COMMUNITY MEDICINE AS PARTICIPANT

Nutrition

Iron deficiency anemia

Communicable diseases with National Health Programmes like

- o -HIV/AIDS
- o -Tuberculosis
- o -Malaria

- o -Polio
- o -Diarrheal diseases
- o -Leprosy
- o -Zoonotic diseases

Lifestyle related diseases with preventive and palliative aspects like

- o Diabetes
- o Hypertension
- o Stroke
- o Obesity
- o Cancers
- o Jaundice

Alcoholism Death and Dying Geriatric Medicine

Adolescent Health

Rational Drug Use Contraception

Industrial health Ethical issues

Applied Epidemiology and statistics in clinical medicine

TOPICWISE MARKS DISTRIBUTION IN COMMUNITY MEDICINE

	Paper I	Marks
1	Concept of Community Medicine	5
2	Sociology & Developmental Health Interface	5
3	Environment including entomology	10
4	RCH and Health of Elderly	10
5	Nutrition & Genetics	10
6	Basic Epidemiology & Screening	15
7	Demography , Biostatistics & Health Information System	5
	Total	60

	Paper II	
1	Communicable diseases including Emerging & re-emerging diseases	15
2	Non-Communicable diseases, Disability, Rehabilitation , Caring for the chronically ill – establishing continuity of care	10
3	Biomedical Waste management, Occupational Health	5
4	Health care delivery system & Urban health Disaster Management Health Planning, management& Financing	10
5	Mental & behavioral health problems Health Education	5
6	National Health Programs & NRHM	10
7	Health legislation & International Health Essential Medicines & Counterfeit Medicines , , Purpose of NDPS Amendment, implications	5
	Total	60

Each Paper should have:

- Structured essay one question: 10 marks
 - Remaining structured short essay question: 50 divided marks
 - Around 50 %problems based competency testing (Cognitive domain) in theory question paper
 - Each paper shall be of 3 Hours duration
- Distribution of Marks

1. Theory

Theory	Max.Marks
Theory Paper I	60
Paper II	60
Internal assessment	20
Oral	10
Total	150

2. Practical

Practical and oral should be conducted in one day

Exercise	Max.Marks
Epidemiological exercise	3
Statistics	4
Clinic social case study	8
OSCE	2
Spotting & OSPE	6
Diet prescription	3
Project	4
Internal assessment	20
Total	50

Grand Total (Theory & Practical) – 200

E. TEXT BOOKS RECOMMENDED:

Prescribed Books

- Park's Text book of preventive and Social Medicine, K. Park (23rd edn.) Banaridas Bhanot
- Textbook of Parasitology, Protozoology and Helminthology – Chatterji K D c.
- Introduction to Health Statistics – Swaroop S E & S. Livingstone Ltd.
- A treatise on Hygiene and Public Health – Ghosh B N Scientific Publising Company, Calcutta
- Text Book of Social & preventive medicine -Mahajan
- Epidemiology for undergraduates – Marina Rajan Joseph – Jaypee Publishers (2007) 1st edn.
- Syamalan's Statistics in Medicine (2006); National Health Programme by Jugal Kishore
- National Health Programme by D K Taneja
- Textbook of preventive & Social Medicine by Sunder lal, Adarsh,
- Pankaj j. Textbook of preventive & Social Medicine by T Bhaskar Rao k.
- Biostatistics by A Indrayan

- l. Methods in Biostatistics by B K Mahajan
- m. Textbook of Preventive & Social Medicine by Gupta & Ghai
- n. Text book of Preventive & Social Medicine by Gupta & Mahajan
- o. Essentials of Community Medicine by Suresh Chandra
- p. Introduction to Biostatistics by Sathya Swaroop
- q. Community Medicine with Recent Advances by AH Suryakantha
- r. Principles and Practice of Community Medicine by Dr. Asma Rahim
- s. Indian Primer to Palliative Care
- t. Community Medicine Simplified by Sreejith P S, Paras Medical Books

Reference Books:

- a. Preventive Medicine and Public Health Appleton Century Crofts – Maxcy, Kenneth F Rosenau
- b. Preventive Medicine for the doctor in his community – Level H R & Clark E G; Mc Graw Hill Book Company
- WHO Online resources
- c. Theory & Practice of Public Health – Hobson W Oxford University Press
- d. American P H Association Communicable Disease Control in man
- e. Manson's tropical diseases – Wilcock's & Manson
- f. Oxford test book of Public Health 4th edn.
- g. Public Health & Preventive Medicine J M Last

WHO online resources

National health websites- mohfw, ncdc

OPHTHALMOLOGY

I. Goal

The broad goal of the teaching of students in Ophthalmology is to provide such knowledge and skills to the student that shall enable him/her 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

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

1. Identify common diseases of the eye
2. Diagnose and treat common diseases of the external eye-conjunctivitis, sty, extraocular foreign body, corneal abrasion, Vitamin A deficiency

3. Recognise and initiate treatment (prior to referral) for sight threatening diseases like acute glaucoma, keratomalacia, corneal ulcer , ocular trauma, alkali/chemical injuries.
4. Demonstrate knowledge of blindness and its causation. Be an active participant in the implementation of the National Programme for Control and prevention of Blindness
5. Integration: To provide an integrated approach towards other disciplines especially ENT, General Surgery, General Medicine etc.

III. Course Contents

The student should have knowledge on the following topics taken during their course.

IV. Topics

Title

Acute conjunctivitis, Trachoma, Allergic conjunctivitis, Pingecula, Pterygium, Xerosis/bitot spots, Dry eye, Angular conjunctivitis, neonatal conjunctivitis, subconj hemorrhage, D/D of conjunctival and limbal nodule

Chronic conjunctivitis, Dry eye, Membraneous conjunctivitis, Inclusion conjunctivitis Corneal Inflammations: Corneal Ulcers-bacterial, , fungal, viral, Mooren's Ulcer Vitamin A Deficiency and keratomalacia, Exposure keratitis, Neuroparalytic keratitis, Corneal blindness, Eye banking, eye donation, Keratoplasty, Arcus senilis, Corneal oedema

Deep / interstitial keratitis, degenerations and dystrophies, Overview of keratorefractive surgery.

Scleritis, episcleritis

Iridocyclitis, Panophthalmitis, Endophthalmitis

Systemic associations of uveitis,Choroiditis, Coloboma iris, ocular albinism,

Vitreous hemorrhage-causes

Synchysis syntillans, Asteroid hyalosis

Angle closure glaucoma, Open angle glaucoma, steroid induced glaucoma, lens induced glaucoma including surgery and management

Cataract and management , cong. Conditions, surgery and complications, lens abnormality Secondary glaucomas, Congenital glaucoma

Fundus changes in Diabetes, Hypertension, anaemias, Pregnancy induced hypertension,

Hematological disorders, Myopia

Photocoagulation

Retinal vascular diseases-

Central retinal artery occlusion, Central retinal vein occlusion, Retinal detachment

Retinopathy of prematurity, Retinitis pigmentosa, retinoblastoma

Pappilledema, Optic neuritis, Optic atrophy

Awareness of amblyopia, Types of squint

Paralytic, non-paralytic)

Common causes of proptosis, Orbital ellulites, Cavernous sinus thrombosis Dacryocystitis-congenital, Acute, chronic, Epiphora

ectropion entropion, trichiasis, ptosis, lagophthalmos, symblepharon, blepharitis, Chalazion, Refractive error, Myopia, hypermetropia, Astigmatism, Presbyopia,

aphakia/pseudophakia, Anisometropia, overview of keratorefractive surgery
Chemical injuries, Open globe injuries, closed globe injuries and first aid treatment including sympathetic injuries.
Siderosis bulbi, Chalcosis, medico legal aspects
Definition and types of blindness.
Causes of blindness
Promotion of eye donation
NPCB, Vision 2020, Eye camps
Symptomatic disturbances of vision, Overview of Recent advances in Ophthalmology
Lasers in Ophthalmology
Enucleation – Indication , technique
Eye & systemic diseases including AIDS
Causes of sudden /partial/ painless dimension of vision
Ocular malignancy-retinoblastoma and malignant melanoma of choroid
Pharmacology
Chronic side effects of systemic medication, local anaesthetics, viscoelastics, steroid and NSAIDS

V. Skills

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

- a. Elicit a history pertinent to general health and ocular status.
- b. Assist in diagnostic procedures such as visual acuity testing, examination of eye, Schiotz tonometry, staining for corneal pathology, confrontation perimetry, direct ophthalmoscopy examination, squint examination.
- c. Interpreting FFA, Optical Coherence Tomography (OCT), Humphrey Perimetry, Corneal Topography, Gonioscopic findings and observing laser and surgical procedures
- d. Diagnose and treat common problems affecting the eye.
- e. Interpret ophthalmic signs in relation to common systemic disorders
- f. Assist/ observe therapeutic procedures such as subconjunctival injection, corneal conjunctival foreign body removal, nasolacrimal duct syringing and tarsorrhaphy
- g. Provide first aid in ophthalmic emergencies.
- h. Assist to organize community survey for visual check up.
- i. Assist to organize primary eye care service through primary health centres.
- j. Use effective means of communication with the public and individual to motivate for surgery in cataract and for eye donation.
- k. Establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team.
- l. Assist in speciality clinics – namely, Cornea, Retina, Glaucoma, Squint & Low Vision Aid clinic
- m.v Communicate with patients regarding common ophthalmological problems, investigations

and treatment .

n.v Common ethical issues in ophthalmology and eye donation.

VI. Knowledge

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

- a. Common problems affecting the eye.
- b. Principles of management of major ophthalmic emergencies
- c. Main systemic diseases affecting the eye.
- d. Effects of local and systemic diseases on patient's vision and the necessary action required to minimize the sequelae of such diseases.
- e. Adverse drug reactions with special reference to ophthalmic manifestations
- f. Magnitude of blindness in India and its main causes.
- g. National programme for control of blindness and its implementation at various levels.
- h. Eye care education for prevention of eye problems.
- i. Role of primary health centre in organization of eye camps.
- j. Organisation of primary health centre and the functioning of the ophthalmic assistant.
- k. Integration of the national programme for control of blindness with the other national health programmes.
- l. Eye bank organization
- m. Caring for the eye and preventing damage in an unconscious patient

VII. Details of Lectures

Basic Anatomy, Physiology of eye, adnexa, lacrimal apparatus and orbit

Diseases of eyelids, lacrimal apparatus, orbit, Disease of conjunctiva

Disease of cornea, Disease of sclera, Disease of uveal tract, Disease of lens

Glaucoma, Vitreous, Injuries of the eye, Intraocular tumours, Retina, Optic nerve

Refractive errors/Refraction, Squint, Operations of the eye, Basic of neuro-ophthalmology, Systemic disease and eye, Adverse drug reactions, Ophthalmic emergencies, Magnitude of blindness

National Programme for control of blindness, Eye bank organization/ Eye donation, Organisation of eye camps, Rehabilitation of the blind.

VIII. Clinical teaching during posting Clinical posting in batches during 5th & 7th Semester.

Theory Lectures, Tutorials, Group discussions, Integrated teaching, Seminars, Approx. 100 Lectures of one hour each.

IX. Details of practicals X.

Clinical postings

8.00 am to 9.00am - Clinical lecture

9.00am -12 noon - Case demonstration in outpatient department discussions during clinical postings, case records, seminars, discussions, clinical exam

12-1 pm: Clinical lecture

Minimum one day per week is devoted for live operative surgery demonstration and discussion.

Separate clinical record/ log books

PATTERN OF EXAMINATION Theory–

one paper 40 marks

(Should contain one question on pre-clinical and para-clinical aspects, of 10 marks)

Oral (viva)-10 marks

Clinical-30 marks

Internal assessment-20marks (theory-10; practical-10)

Total-100 marks

Scheme of Practical Examination

One long Case : 1 x 15=15 marks

Two Short Case : 2 x 5 = 10 marks

OSCE (5 stations) : 5 x 1 = 5 marks

Total : 30 marks

Internal Assessment : 10 marks

Grand Total : 40 marks

Text book recommended

1. Parson's disease of eye – Sihota & Tandon

2. Ophthalmology for under graduates– Dr. P.S. GirijaDevi

Reference books

Clinical ophthalmology : Kanski J J

OTORHINOLARYNGOLOGY

A. Goal

The broad goal of teaching undergraduate students Otorhinolaryngology is to ensure that they

acquire adequate knowledge, skills and attitude for optimum treatment (including emergencies), rehabilitation of common otorhinolaryngologic disorders and assessment of the need for referral to specialised care.

B. Objectives

Objectives are categorised as objectives for

1. Knowledge
2. Skills
3. Attitude

1. Knowledge

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

- a. describe the basic physiology of common ear, nose and throat diseases including emergencies.
- b. adopt rational use of commonly used drugs, keeping in mind their adverse reactions
- c. suggest common investigation procedures and interpret their findings

2. Skills

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

- a. examine and diagnose common ear, nose and throat problems including the pre-malignant, malignant disorders of head and neck
- b. manage ear, nose and throat problems at the first level of care and be able to refer whenever necessary
- c. observe and assist in carrying out minor surgical procedures like ear syringing, ear dressing and nasal packing, tube feeding, managing and care of long term tracheostomy
- d. assist in certain procedures such as tracheostomy, endoscopies and removal of foreign bodies
- e. communicate effectively with other members of medical profession including nursing, para medical, technical staff and other members of health care teams in a collaborative manner
- f. communicate effectively and appropriately with patients and their attendants.
- g. communicate with patients regarding common ENT problems, investigations and treatment .
- h. address common ethical issues in ENT practice

3. Attitude

At the end of the course the student shall understand the need to have the following attitudes

- a. attitudes needed to work as a team member
- b. attitudes needed to lead a team
- c. attitudes needed to win patient confidence
- d. attitudes needed for continuing improvement of clinical knowledge and skills. The

undergraduate training in ear, nose and throat will provide an integrated approach towards disciplines, especially neurosciences, ophthalmology and general surgery.

- e. Attitudes for showing compassion to the hearing impaired, tracheostomised patients including assisting them in speech, patients with malignancies, including terminal malignancies

C. Detailed syllabus

1. Overview of course

Duration of the course-2 months (distributed in 2 semesters - first half in 6th semester and second half in 7th semester)

THEORY + INNOVATIVE SESSION	- 110 hrs
PRACTICALS	- 180 hrs

2. Details of lectures

2.1 Ear

2.1.1 Relevant anatomy of external middle and inner ears, auditory physiology including pathway of hearing

2.1.2 Assessment of hearing including types of audiometry. Special mention on pure tone audiometry, impedance audiometry, speech audiometry, otoacoustic emissions, BERA

2.1.3 Deafness - Classification, causes, investigations, disability calculation, early detection of deafness in children and rehabilitation. Special mention of otosclerosis - its clinical features and management, congenital deafness, cochlear implantation, learning and speech rehabilitation

2.1.4 Diseases of external ear: Wax, furuncle ear, otomycosis, foreign body, keratosis, exostosis and malignant otitis externa

2.1.5 Diseases of middle ear: Acute otitis media, otitis media with effusion, chronic suppurative otitis media - mucosal and squamous types, clinical features, management, complications of middle ear infections, mastoidectomy, tympanoplasty

2.1.6 Diseases of inner ear: Vertigo - classification, causes, investigations and management. Special mention of Meniere's disease, benign paroxysmal positional vertigo and acoustic neuroma

2.1.7 Miscellaneous conditions like otalgia, tinnitus, facial nerve anatomy and its disorders

2.2 Nose and paranasal sinuses

2.2.1 Relevant anatomy of nose and physiology including pathway of smell

2.2.2 Disorders of external nose and vestibule

2.2.3 Disorders of nasal septum, sub-mucous resection and septoplasty. Mention rhinoplasty

2.2.4 Rhinitis - etiology, classification and management. Special mention of allergic rhinitis, vasomotor rhinitis, atrophic rhinitis and allergic fungal rhino-sinusitis, CSF rhinorrhoea.

2.2.5 Acute sinusitis (in detail) & chronic sinusitis (in detail). Complications of infections of

nose and paranasal sinuses

2.2.6 Facio-maxillary injuries in detail

2.2.7 Nasal polyposis with emphasis on FESS, Caldwell Luc

2.2.8 Epistaxis – causes & management, granulomatous conditions of nose

2.2.9 Tumours of nose and PNS (special mention of inverted papilloma, nasopharyngeal angiofibroma and malignancy of paranasal sinuses and nasopharynx)

2.3 Throat

2.3.1 Relevant anatomy of pharynx, larynx, oesophagus, physiology of deglutition, phonation

2.3.2 Tonsils and adenoids and their infections in detail. Special mention of quinsy, patches in oral cavity and pharynx, tonsillectomy, adenoidectomy

2.3.3 Neck space infections - Ludwig's angina, retropharyngeal and parapharyngeal abscess, clinical features, management and complications

2.3.4 Acute and chronic infections of larynx, laryngeal paralysis, vocal nodule, vocal polyp

2.3.5 Hoarseness - diagnosis and management, direct laryngoscopy. Mention stroboscopy, micro-laryngeal surgery and video-laryngeal surgery

2.3.6 Stridor - diagnosis and management. Tracheostomy in detail including indications, tubes, procedure and complications

2.3.7 Benign and malignant lesions of larynx and laryngo-pharynx

2.3.8 Dysphagia - causes, investigations and management. Special mention of malignancy

2.3.9 Miscellaneous conditions like dry mouth, mouth care, oral candidiasis - prevalence, prevention, management, reflux diseases (GERD, LPR), Plummer Vinson, HIV in ENT.

2.3.10 Foreign bodies of aero-digestive tract - diagnosis, management and complications, endoscopies in ENT and their complications.

2.3.11 Rehabilitation - swallowing, speech (including assisted speech in tracheostomised patients) respecting and working with paramedical therapists

3. Details of practical

Clinical postings

08:00 am - 09:00 am: Clinical lecture

09:00 am - 12:00 pm: Case demonstration in out-patient department, clinical discussions

12:00 pm - 01:00 pm: Clinical lecture, Minimum one day per week is devoted to live operative surgery, demonstration and discussion

Separate clinical record books should be kept and at least ten cases to be included

4. Text books recommended and other learning resources:

Prescribed text books

1. Diseases of ear, nose and throat - P L Dhingra (Elsevier's publications)
2. Text book of ear, nose, throat and head and neck diseases - P Hazarika, D R Nayak, R Balakrishna (CBS publishers)
3. A short Practice of Otorhinolaryngology- Prof K K Ramalingam, Dr B Sriramamurthy,

Prof Ravi Ramalingam- All India Publishers and distributors

4. Essentials of Ear, Nose and Throat- Mohan Bansal- Jaypee Publishers
5. ENT simplified: Batchi Hathiram and D S Grewal. (Bhalani publishers)

Reference Books

6. Scot Brown's Otorhinolaryngology, Head and Neck surgery 7th edition - (Edward Arnold publishers limited)
7. Logan Turner's text book of Otorhinolaryngology
8. Other resource materials
 - 9.1.1.1 Skill laboratory
 - 9.1.1.2 CDs and DVDs
 - 9.1.1.3 Internet

D. Evaluation

Evaluation must be both formative and summative to achieve the objectives mentioned earlier.

There must be internal evaluation as well as external evaluation. Evaluation will be done through examinations.

1. Internal Examinations

Theory - 2 numbers

Exam 1: After completion of the 6th semester postings in ENT

Duration: 2 hours

Topic: Otology

Marks: 40

Exam 2: After completion of the 7th semester postings in ENT

Duration: 2 hours

Topic: Whole subject of ENT

Marks: 40

Practical - 3 numbers

Exams 1 & 2: one each at the end of the 1 month posting in semester 6 and 7

Content: Long case and VIVA

Marks: 30 & 10

Exam 3: Final practical

Content: Same as university examination (Long case, OSCE & VIVA)

Marks: 20, 10 & 10

2. University examination

Theory Total: 40 Marks

VIVA Total: 10 Marks

Practical Total: 30 Marks (Clinical (long case: 20 marks and OSCE: 10 marks)

3. Final marks

Theory University : 40 Marks

	University VIVA	: 10 Marks
	Internal assessment	: 10 marks
	Total	: 60 Marks
Practical	University	: 30 Marks
	Internal assessment	: 10 marks
	Total	: 40 Marks
Grand total		: 100 Marks

MEDICINE AND ITS ALLIED SPECIALITIES

MEDICINE

A. GOAL

The broad goal of teaching of undergraduate students Medicine is to have the knowledge, skills and behavioural attributes to function effectively as the first contact physician/ family doctor.

B. OBJECTIVES (1)

Knowledge

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

- Diagnose common clinical disorders with special reference to infectious diseases, nutritional disorders, tropical and environmental diseases;
- Outline various modes of management including drug therapeutics especially dosage, side effects, toxicity, interaction, indications and contraindications;
- Propose diagnostic and investigative procedures and ability to interpret;
- Provide first level management of acute emergencies promptly and efficiently and decide the timing and level of referral of required.;
- Recognize geriatric disorders and their management
- Approach to terminal phase, end of life care, bereavement
- Current Laws relevant to end of life care decisions – withholding, withdrawing artificial life interventions

2. Skills

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

- Develop clinical skills (history taking, clinical examination and other instruments of examination) in various common medical disorders and emergencies.
- Refer a patient to secondary and/or tertiary level of health care after having instituted primary care.
- Perform& interpret simple routine investigation like hemogram, stool, urine, sputum and biological examinations

d. Assist the common bed-side investigate procedures like pleural tap, lumbar puncture, bone marrow aspiration/biopsy and liver biopsy.

e. Learn to Communicate with patients regarding common Medical problems, investigations and treatment .

f. Learn to address Common ethical issues in medical ward and OPD .

g. * Student should be aware of the rights of the patient, issues like autonomy, consent etc

- Integrated Care for chronic diseases– Assess, advice, agree, arrange, assist
- Principles of managing symptoms of advanced progressive diseases
- Palliative Care for advanced cardiac failure, renal failure
- Palliative Care for breathlessness, Nausea/Vomiting, Delirium

Palliative care for neurological disorders

3. Integration

a. With community medicine and physical medicine and rehabilitation to have the knowledge and be able to manage important current national health programs, also to be able to view the patient in his/her total physical, social and economic milieu:

b. With other relevant academic input which provide scientific basis of clinical medicine eg: anatomy, physiology, biochemistry, microbiology, pathology and pharmacology.

C. DETAILED SYLLABUS

DETAILS OF THE COURSE

Duration of the course	:5 semesters – III, V, VI, VIII & IX
Total number of theory	: 300
Lectures	: 100

Innovative sessions	: 200
Practicals	: Clinical posting as per schedule attached
(Project work, Seminars, Structured	Integrated teaching, Formative evaluation, Revision)

LECTURES

1. Molecular and Genetic factors in disease

- a. Basics of cell and molecular biology; DNA, RNA, Genes, mitochondria, cell membrane, receptors; protein production and degradation
- b. Cell division, cell death
- c. Patterns of inheritance and common disorders, investigations, counseling
- d. Stem cell therapy, gene therapy, new horizons

Exercises : Eg. The cell ; a family tree for various common inherited diseases

2. Nutrition and nutritional disorders

- a. Macronutrients, dietary recommendations
- b. Micronutrients-vitamins, minerals, deficiencies & excess
- c. Energy balance- body fat distribution, regulation, needs, responses to over nutrition and under nutrition, assessment of nutritional status
- d. Assessment & Management of Obesity & under nutrition
- e. Nutritional support in hospital, in pregnancy & lactation

Exercises: eg western vs Indian (also different parts of India) meals ; role of fiber in diet

3. Environmental and Occupational problems

- a. Environmental effects on health, alcohol, smoking, air pollution, radiation hazards, Temperature regulation and extremes of temperature, high altitude, under water, problems of air travel, epidemics- Triage & Resuscitation
- b. Hanging, drowning, electrical injuries; lightning injury
- c. Fluorosis
- d. Food hygiene and poisoning

Exercises: eg how to plan an epidemiological study; Minamata disease, others

4. Poisoning

- a. Evaluation of a patient with suspected poisoning,
- b. Sedatives, antidepressants, antipsychotics;
- c. insecticides, pesticides, rodenticides- organophosphorus, organochlorides, Rat poison, Paraquat
- d. Odorous
- e. Acid & alkali, Ethyl & Methyl alcohol
- f. Bites of venomous animals, including snakes, spiders, scorpion, wasps
- g. Evaluation of a patient with suspected envenomation, general principles of management

Exercises: Eg, Common poisons in the region, presentations, management; Composition of common Tablets/ capsules/ household remedies/ chemicals around the house and workplace- with measures to eliminate the poison

5. Immunological factors

- a. Anatomy, physiology of the immune system; B & T lymphocytes, immunoglobulin, immune reaction

- b. The inflammatory response- physiology, pathology, presentations, assessment
- c. Autoimmune diseases- pathology, susceptibility, assessment
- d. Immune deficiency- presentation, syndromes
- e. Anaphylaxis, urticaria, angioedema, transplantation immunology
- 6. Infectious disease
 - a. Viral infections-
 - i. with exanthem: measles, chicken pox, herpes zoster, herpes simplex 1 & 2, dengue, hand foot and mouth disease
 - ii. Without exanthem- influenza, mumps
 - iii. With rheumatological involvement- Chikungunya
 - iv. With GI, Respiratory, Neurological involvement
 - b. Bacterial infections-
 - i. Common gram positive infections-overview, then specifics- skin, soft tissue, bone infections, cellulitis,
 - ii. Common gram negative infections- overview, then specifics
 - iii. Enteric infections. Salmonella including typhoid, paratyphoid, bacillary dysentery-*shigella*, different causes of food poisoning, cholera, *C. Difficile*,
 - iv. Respiratory infections- Sinusitis, bronchitis, diphtheria, pneumonias, pneumocystis carinii, chlamydia
 - v. Mycobacterial infections- tuberculosis, Hansen's; atypical Mycobacteria
 - vi. HIV infection, AIDS
 - 1. Clinical presentations, investigations, diagnosis of HIV infections
 - 2. The importance of pre-test & post- test counseling, breaking bad news
 - 3. Natural history and Staging of HIV
 - 4. Antiretroviral therapy, Preventing opportunistic infections
 - vii. CNS-
 - 1. Meningitis -viral, bacterial, tuberculous, fungal, how to differentiate, management principles ; Chemoprophylaxis for purulent meningitis
 - 2. Parenchymal –viral encephalitis, Rabies, Poliomyelitis, H.zoster, SSPE
 - 3. Cerebral abscess, neurosyphilis
 - viii. Diseases caused by bacterial toxins- tetanus, botulism
 - ix. Rickettsial fevers- typhus
 - x. Protozoa infections. Malaria, Leishmaniasis, Amoebiasis, Giardiasis
 - xi. Helminthic infestations Ancylostomiasis, filariasis (Luminal & tissue nematodes)
 - xii. Tape worms
 - xiii. Fungal infections.

1. Superficial- candidiasis
 2. Subcutaneous- mycetoma
 3. Systemic-aspergillosis, cryptococcosis, histoplasmosis, coccidiomycosis
 - c. General principles of use of antimicrobial agents, abuse of antimicrobials; antimicrobial resistance; antiviral, antifungal agents
 - d. Approach to a patient with suspected infection, sepsis, eosinophilia, PUO
 - e. Adult immunisation
7. Fluid and Electrolytes
- a. Water & Electrolyte balance, hypovolemia, dehydration- assessment, correction
 - b. disorders of Sodium, Potassium balance, acidosis, alkalosis
- Exercises:**
8. Renal medicine
- a. Functional anatomy, Structure & function of the Nephron, Clinical assessment of the Kidney & Urinary tract; significance of examining the urine, assessing GFR, proteinuria, investigating for renal vascular disease, infections of the urinary tract
 - b. Glomerular vs tubular disease, Nephrotic syndrome, acute kidney injury- causes, complications, management; Chronic kidney disease- causes, complications, including anemia, bone disease, management- conservative, preventing deterioration; renal replacement therapy, renal transplantation- indications, problems, costs
 - c. Pregnancy and renal disease, drugs and the kidney
- Exercises:**
9. CVS
- a. Functional anatomy & physiology, cardiac Cycle, Ventricular function, Biomarkers, Clinical assessment of the heart and circulation- ECG, chest Xray, basics of angiography
 - b. Coronary circulation, coronary artery disease, its complications, angina, myocardial infarction, management
 - c. Conducting system of the heart, abnormalities of cardiac rate and rhythm, principles of identification & basic management
 - d. Acute Rheumatic fever, rheumatic heart disease, assessment, complications, management options, infective endocarditis
 - e. Congenital heart disease, assessment, complications, management options
 - f. Myocardial disease. Myocarditis, cardiomyopathy
 - g. Acute & Chronic pericarditis
 - h. Deep vein thrombosis, pulmonary embolism, management
- Exercises: Cardiac cycle, normal ECG, ECG in Myocardial infarction, atrial fibrillation, complete heart block**

10. Respiratory System

- a. Functional anatomy & physiology, Bronchopulmonary segments, Clinical assessment of the lungs, control of breathing, investigations - pulmonary function tests, imaging
- b. Bronchal Asthma, bronchitis, bronchiectasis, Lung abcess, bronchogenic Ca, obstructive sleep apnoea
- c. COPD, corpulmonale
- d. Pleural diseases
- e. Interstitial Lung disease
- f. Respiratory failure- assessment, management

Exercises: Bronchopulmonary segments, PFTs, clinical importance

11. GIT

- a. Functional anatomy & physiology, Digestion, absorption, gut hormones, Clinical assessment & investigations of the GIT,
- b. Functional anatomy & physiology, Clinical assessment & investigations of the hepatobiliary system; interpreting Liver Function tests
- c. Dysphagia, Gastroesophageal reflux, peptic ulcer disease, gastric Ca, upper GI Bleeding,
- d. Symptoms and signs, investigations of Diseases of the small & large gut- diarrhea, malabsorption, lactose intolerance, infections of the small gut, irritable bowel syndrome, ischemic of the gut
- e. Inflammatory bowel disorders, diverticulosis of the large gut, tumors of the large gut, constipation
- f. Acute & chronic pancreatitis, gallstones, other GB diseases
- g. Acute and chronic Hepatitis
- h. Chronic liver disease
- i. Assessment of a patient with jaundice, ascites, Acute liver failure, hepatic encephalopathy, portal hypertension, portal vein thrombosis, chronic liver disease
- j. Alcoholic, non-alcoholic liver disease, autoimmune liver disease, primary & secondary malignancy of the liver
- k. Drug- induced liver disease
- l. Inherited liver diseases- Wilson's, haemochromatosis, Gilbert's
- m. Pregnancy & the liver
- n. Liver transplantation

Exercises: Liver function tests- various abnormalities; abnormalities in ascitic

fluid

12. Hematology

- a. Functional anatomy & physiology, Haemopoiesis, Clinical assessment & investigations of the haemopoietic system; Iron, B12, Folate absorption, abnormalities
- b. Interpreting a haemogram
- c. Bleeding & Clotting disorders, Tests of coagulation, Bleeding & clotting disorders,
- d. Thrombotic disorders
- e. Anemia- presenting features, assessment, investigations, management
- f. Different types of anemia, Fe deficiency, B12, Folate, Hemolytic, anemia of chronic disease
- g. Haemoglobinopathies- assessment, sickle cell disease, thalassemias
- h. Polycythemia- Primary & Secondary, presenting features, assessment, management
- i. High and low White cell counts- clinical assessment, investigations, management
- j. High and low platelet counts- clinical assessment, investigations, management
- k. Pancytopenia
- l. Hematological malignancies, lymphoma, Lymphadenopathy, splenomegaly
- m. Paraproteinemias
- n. Blood products, transfusions, adverse effects, safe transfusions, stem cell transplantation

Exercises: Abnormalities in a Haemogram, blood smear

13. Rheumatology

- a. Presenting problems , Clinical examination, assessment, investigations of rheumatological disease: Osteoarthritis, Rheumatoid arthritis, crystal arthropathy, SLE, systemic sclerosis, seronegative spondyloarthropathies, reactive arthritis, connective tissue diseases, vasculitis
- b. Non-Pharmacological & pharmacological therapy of rheumatological disease- principles, problems, side effects
- c. Osteoporosis, vitamin D deficiency

Exercises: abnormalities in the joint fluid

14. Endocrinology

- a. Organization of the endocrine system, functional anatomy & physiology, clinical presentations, overview of investigations
- b. Disorders of Pituitary function
- c. Thyroid gland-anatomy, physiology, abnormalities (hyper & Hypo function, thyroiditis)

- d. Adrenal glands – functional anatomy, physiology, assessment, Cushing's, Addison's, Hyperaldosteronism, Pheochromocytoma
- e. Calcium metabolism, hyperparathyroidism, hypercalcemia, hypocalcemia, tetany
- f. Diabetes mellitus
 - i. Clinical presentations, examination; diabetes mellitus Types 1&2 , other forms
 - ii. Diagnosis of diabetes mellitus, complications
 - iii. Managing diabetes: Life style management, Diet and Drugs in the management of diabetes mellitus, oral medications, insulin, incretin based therapy
 - iv. Hypoglycemia, diabetes in special situations
 - v. Managing the complications of diabetes mellitus

Exercises: Inter-relation of the Pituitary with other endocrine organs; Thyroid function tests; diagnosing diabetes mellitus; identification & management of the complications of Diabetes; differences in management of type 1 and Type 2 diabetes

15. Nervous system

- a. Overview of the nervous system, basic anatomy & blood supply of the Brain, csf production & circulation, abnormalities, the need for localization; the value of history and physical examination, overview of tests available
- b. Headache syndromes, migraine, seizures, anticonvulsant therapy
- c. Clinical features of Meningitis –how to differentiate & manage the various types,
- d. Intracranial space occupying lesions- including subdural haemorrhage, the need to identify and treat early
- e. Delirium, Coma, brain death
- f. Strokes : infarction vs hemorrhage, assessment, broad principles of localization , the need for urgent intervention when possible
- g. Amnesia, dementias, neurodegenerative disorders
- h. Demyelinating disorders, paraneoplastic neurological disorders
- i. Parkinson's disease, Motor neurons disease, CNS Tuberculosis
- j. Anatomy & Overview of diseases of the spinal cord, transverse myelitis, Syringomyelia, tumors,
- k. Polyneuropathy, Guillain Barré syndrome, Peripheral neuropathy
- l. Myasthenia gravis, other myasthenia syndromes, disorders of muscle

Exercises: The structure of the Neuron; clinical differences between upper motor and lower motor neurone lesions; differentiating hemispheric from brainstem lesions; differentiating spinal cord, peripheral nerve and muscle disease

16. Medical disorders of Pregnancy

- a. Prenatal genetic testing, infections in the antenatal period, prescribing in pregnancy, air travel
- b. Gestational diabetes mellitus
- c. Endocrine disorders- pituitary, thyroid, adrenal,
- d. Liver, kidney, cardiac, respiratory, neurologic disease , venous thromboembolism in pregnancy

17. Critical care

- a. Severe sepsis, shock, Multi-organ failure
- b. Management of acute LVF, acute severe asthma, acute coronary syndrome
- c. Cardiopulmonary resuscitation, BLS, ACLS, when / whether to resuscitate
- d. Disseminated intravascular coagulation
- e. Coma, hepatic encephalopathy
- f. Bioterrorism, disaster management , mass casualty, the concept of triage.

18. Ageing

- a. Biology of ageing, comprehensive assessment, Frailty, problems in old age- falls, delirium, dizziness, urinary incontinence, cardiac, GI, neurological problems
- b. How much to investigate? How aggressive must one be?
- c. Prescribing in the elderly
- d. Rehabilitation

19. Pain and Palliative care

- a. Assessment and measurement of pain, psychological aspects of chronic pain
- b. Management of pain, breathlessness, cough, nausea, vomiting, dehydration, GI obstruction, weight loss, lassitude, anxiety, depression
- c. How to break bad news, how to prepare a person to face terminal disease, dying

20. Clinical Pharmacy and Therapeutics

- a. General principles of prescribing, rational use of drugs, monitoring drug therapy
- b. Drug interactions, Adverse drug reactions,

TEXT BOOKS RECOMMENDED

1. Principles and practice of Medicine by Davidson
2. Davidsons clinical cases by Mark W Stratchan and S.K.Sharma
3. Text Book of Medicine by Kumar and Clark
4. Text Book of Medicine by Dr.K.V.Krishnadas
5. Clinical Medicine by Dr.K.V.Krishnadas
6. Macleod's clinical examination
7. Hutchison's textbook of clinical methods
8. Hari's Essentials of Clinical Medicine by Dr. P.Baburaj
9. Introduction to clinical methods in medicine – 2nd edition edited by Dr. V.K Lakshmanakumar

REFERENCE TEXT BOOKS

1. Harrison's Principles of Internal Medicine
2. Text Book of Medicine Cecil & Loeb
3. API textbook of Medicine
4. Oxford Textbook of Medicine
5. Clinical Medicine-Vakil and Golwala
- 6.

Psychiatry 20Hrs

- Classification and aetiological factors in psychiatric disorder
- Delirium and Dementia
- Schizophrenia
- Bipolar affective disorders
- Depressive disorders
- Anxiety disorders and OCD
- Stress and adjustment disorders
- Psychiatric presentations in general practice
- Personality disorders
- Substance use disorders
- Attempted suicide and suicide risk
- Mental retardation and learning disability
- Autism spectrum disorder and ADHD
- Sexual disorders
- Breaking bad news and crisis intervention
- Treatment of psychiatric disorders
- Basic communication and counseling skills
- Rehabilitation
- Legal aspects of psychiatry

DERMATOLOGY LECTURES -30 HOURS

- Structure and function of skin
- Infections of Skin
- Care of skin, preventing and managing bed sore in a bed ridden patient
- Eczematous diseases
- Bullous skin diseases
- Connective Tissue Diseases
- Pigmentary diseases
- Papulo squamous diseases
- Neoplastic diseases of skin
- Lesions of skin appendages
- Adverse drug reactions
- Veneral diseases

- Leprosy
 - Stigma in medicine and its management in diseases like HIV,STD, Leprosy
- Communicating with dermatology/STD/Leprosy patients

RADIOLOGY LECTURES (INCLUDING RADIOTHERAPY)-20 HOURS

Production of X-rays
 Biological changes Skeletal
 Radiology Chest &
 Mediastinum
 Gastrointestinal system
 Hepatobiliary system
 Genitourinary system
 Neuroimaging modalities
 Emergency Radiology

Respiratory Medicine Lectures 20 hrs

Evaluation of cough
 Evaluation of dyspnoea
 Investigations in pulmonary medicine
 Bronchial Asthma
 COPD
 Pneumonia
 Lung abscess
 Tuberculosis pathogenesis
 Diagnosis & management
 Control program
 Pleural effusion
 Empyema
 Neoplasms of lung
 Environmental & occupational lung diseases
 Sleep disordered breathing
 Pulmonary hypertension
 Pulmonary embolism
 Interstitial lung diseases
 Basic procedures
 Conservative management of irreversible breathlessness in terminally ill patients.

Home Oxygen therapy – Pros and cons; considerations
 before prescribing ambulatory oxygen

INNOVATIVE SESSIONS

(Project work, Seminars, Structured discussion, integrated teaching, Formative evaluation, Revision and Morning sessions)

A seminar on Pain – acute, chronic, classification, management, concept of total pain Controlled substances – essential analgesics Pain relief as Human Right

I. Common symptoms of disease/clinical approach to

- a) Pain
- b) Fever
- c) Respiratory symptoms
- d) Pallor, Jaundice, Oedema
- e) GI symptoms(Chronic constipation as a seminar – practical skills on high up enema)
- f) Haematemesis, Melaena, Bleeding PR/ Haematochezia
- g) Urinary symptoms
- h) Neurological symptoms : headache, dizziness, vertigo, weakness, sensory loss
- i) Musculoskeletal symptoms : joint swelling,
- j) Weight loss and gain

Applied Basic Sciences topics with relevance to Medicine

Cardiac cycle and ventricular functions

Cardiac biomarkers, (LFT/RFT/PFT) Normal CSF

Blood supply of brain

Lobar function of brain

Functional anatomy of spinal cord Functional anatomy of cranial nerves Bronchopulmonary segments Pulmonary circulative

Lymphatic drainage of Lung Structure and functions of Nephrons Digestion and absorption

Haemopoiesis and Iron metabolism

Thyroid functions and hormones Calcium metabolism

Physiology of pain (&Pathophysiology) Chronic pain as a disease

Survey of pain score in every In-patient of a chosen ward)

III. Project

work IV.

Seminars

V. Structured discussion

VI. Formative evaluation

VII. Morning sessions

VIII. Revision

EXAMINATION

At the end of the course the student should have sufficient

- a) Knowledge to diagnose clinical disorders with special reference to Infectious Diseases,

- nutritional diseases, outline various modes of management including drug therapy.
 b) Skills in history taking, clinical examination and diagnosis. c)
 d) Perform simple routine investigations
 e) Assist the common bed side investigative procedures like pleural tap, lumbar puncture

Part – II		
a)	Medicine	
	Theory – two papers 60 marks each	120 marks
	Paper I – General Medicine	
	Paper II – General Medicine (including psychiatry,	
	dermatology and STD)	
	(Shall contain one question on basic sciences and allied	
	Subjects)	
	Oral (Viva) interpretation of Xray , ECG etc.	20 marks
	Clinical (bedside)	100 marks
	Internal Assessment	60 marks
	(Theory – 30: Practical – 30)	
	Total	300 marks
	Paper -I	

General Medicine – Section – A

I.	10 marks x 1 = 10 marks	
(problem oriented question)		
II.	2 marks x 10 = 20 marks)	
(short answers)		
Section -B		
III. structured question	10 marks x 1 = 10 marks	
IV. short question	2 marks x 10 = 20 marks	
Paper – II		

General Medicine including Psychiatry, Dermatology and Radio diagnosis

Section – A

1. Problem oriented question 10 marks x 1 = 10 marks

II.	Short answer question	2 marks x 10	= 20 marks
Section – B			
II.	Structured question	10 marks x 1	= 10 marks
III.	short answer question	2 marks x 10	= 20 marks

Problem oriented and structured questions must be from General Medicine. There should not be more than one question each from radiology, dermatology and psychiatry.

Ensure questions include Pain, - ethical concerns, whole person concerns, symptom management questions are assessed along with management of the disease

-Role of Multi-disciplinary team work is assessed

SCHEME OF Practical Examination

Long case = 40 Marks Time (60 minutes)

(Marks to be allotted for History- 10 marks, Physical examination- 10 marks, Case sheet writing- 10 marks; Discussion- arriving at a diagnosis + simple bedside investigations + basics of EBM - 10 marks)

Assessment of Long case should be based on

1. Case sheet writing Methodology, Symptoms Signs Diagnosis
2. Elicitation of findings
3. Differential diagnosis
4. Suggested investigation for diagnosis
5. Treatment of the situation

OSCE (4 stations- 2.5 marks each, total 10 the objective shall be to assess the candidate on his knowledge, psychomotor skills and communication skills.

Time for each OSCE station 2 minutes

Total = Long Case (40) + OSCE (10) : 50 marks .

Short Cases (2x 25= 50 marks) (15 minutes each)

(Questions for the Long Case, OSCE, Short Cases shall be on the basis of 60% 'must know', 30% 'good to know' and 10% 'nice to know')

Viva voce: 4 stations, 5 marks each (Total 20 marks)

PAEDIATRICS&NEONATOLOGY

DETAILS OF THE COURSE

Duration of course	: 10 weeks in 3 semesters	VI, VIII & IX
Total number of hours theory	:100	

Lectures :34 (including pediatric surgery)

Clinical
8-9 AM Tutorials
9 AM 1 PM Case discussions & Innovative sessions

Exposure of students to newborns and emergency management is inadequate during ten weeks of under graduate postings. During evening hours they should be posted in causality, ICU and new born nursery.

General guidelines

Apart from bedside discussion there should be 66 hours of Innovative sessions during clinical sessions in the forenoon session. This comprises of project work, seminars, structured discussion, and integrated teaching.

Simple day to day problems should be given more importance.

Sessions which will improve communication skills and attitude should be given more importance.

Pediatric casualty posting is compulsory during the final year posting. They should be posted in Intensive care unit and new born nurseries during evening hours with due care to prevent infections in nurseries .

There should be enough pediatric surgery case exposure during clinical sessions

The training in pediatrics should prepare the student to deliver preventive, promotive, curative and rehabilitative services for care of children both in the community and rehabilitative services

and at hospital as part of a team in an integrated form with other subjects.
For integrated teaching the topics should be planned in advance by discussion with different specialties.

GOALS

Students should have knowledge and skill to diagnose common problems in newborn and child, identify life threatening situations and to decide when to refer to higher centers.

OBJECTIVES

1. Knowledge

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

- a) Describe the normal growth and development during fetal life, neonatal period, childhood and adolescence and outline deviations thereof.
- b) Know age related requirements of calories, nutrients, fluids, in health and disease.
- c) Know the common pediatric disorders and emergencies in terms of epidemiology, etiology pathogenesis, clinical manifestations, diagnosis, rational therapy and rehabilitation.
- d) Know preventive strategies for common infectious diseases, malnutrition, genetic and metabolic disorders, poisonings, accidents and child abuse.
- e) Know national programs relating to child health including immunization.
- f) Basic knowledge about special situations like newborn and adolescents

2. Skills

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

- a) Take a detailed pediatric history; conduct an appropriate physical examination of children including neonates. Make clinical diagnosis, do common bedside investigative procedures, interpret common lab results and plan and institute therapy.
- b) Take anthropometric measurements, Casualty posting may be utilized to train or procedures like resuscitation of newborn infants at birth, prepare Oral Rehydration Solution performs tuberculin test, administer vaccines available under current national immunization program, IV canulation, start an intravenous saline and provide naso-gastric feeding. Learning from residents should be encouraged. Evening hours apart they may get familiar with common drugs and equipment from casualty and intensive care units
- c) Observing or video demonstration of diagnostic procedures such as lumbar puncture, liver and kidney biopsy, bone marrow aspirations, pleural tap and ascitis tap is desirable
- d) Distinguish between normal newborn babies and those requiring special care and institute early care to all new born babies. Provide correct guidance and counseling in breast

feeding.

- e) Provide ambulatory care to all sick children, identify indications for specialized inpatient care and ensure timely referral of those who require hospitalization
- f) Know how to write a proper prescription & referral letter. How to interpret investigations to be stressed. They may be assigned specific tasks which will improve skills in the management, communication and attitude towards patients.
- g) To develop basic communication skills to communicate with pediatric patients and parents.
- h) Sensitive to the ethical issues while dealing with children and adolescents.
- i) To take consent for procedures
- j) Learn to address Common ethical issues in pediatrics ward and OPD.
- k) Application of child rights in the background of medical practice

Methods

Seminars
Videos and simulation
Bedside clinics
Hands on procedures
Integrated sessions
Participation in procedures.

DETAILS OF LECTURES

INFECTIOUS DISEASES

Poliomyelitis, measles, diphtheria, tetanus, Childhood tuberculosis, typhoid fever, HIV infection, Dengue and chikungunya, viral haemorrhagic fevers and malaria. Pertussis, Mumps, Rubella, Influenza, H1N1, seasonal epidemics.

GIT AND LIVER

Diarrhoeal diseases, hepatitis and hepatic failure, Cirrhosis liver and portal hypertension. helminthic infestations.

CARDIO VASCULAR SYSTEM

Congenital heart diseases, Rheumatic fever and RHD , C C F , Hypertension , Infective endocarditis

RESPIRATORY SYSTEM

Childhood asthma, Acute Bronchiolitis, Pneumonias in children, Suppurative Lung disease, smoking and environmental pollution, Croup syndromes

C.N.S

Cerebral palsy, Mental retardation, Meningitis and Encephalitis, Seizure disorders & Febrile Seizures.

Haemo poetic system

Anemia in children, bleeding disorders

Nephrology

Disorders of kidney acute nephritis, Nephrotic syndrome, Renal failure, Urinary tract infection

Endocrine disorders

Diabetes mellitus, Thyroid disorders, short stature

Connective Tissue disorders

JRA & vasculitis (SLE and HSP, Kawasaki disease)

Malignancies in children

Leukemia, Lymphomas, Neuroblastoma, Solid tumors, CNS tumors

National programs

Others

Rational use of antibiotics

Common poisonings

Pediatric Palliative Care

New Born

Respiratory distress in new born

Neonatal seizures
Congenital malformations
Antenatal diagnosis and treatment
Sepsis in new born.

Behavioral problems in children

Common poisoning and accidents in children

Nutrition

BFHI, IYCF, Nutritional assessment, SAM, Specific Vitamin deficiency disorders

Other National programs

Genetics

Common chromosomal disorders like Down's syndrome, Turner syndrome.

Avoid repetitions of topics already covered in morning sessions. Newer teaching methods may be utilized which will improve the student participation and interest

TUTORIALS

Stress should be given on the clinical approach of common problems

1. Introduction to pediatrics, History taking and general Examination
2. Examination of all the major systems
3. Growth and development, demonstrate how to do. Common disorders of growth and development may be demonstrated. Charting and Interpretation of growth charts
4. Nutrition, including the assessment. Common disorders of nutrition may be demonstrated
Avoid detailed theory of nutritional disorders in morning session
5. Immunization –National immunization schedule & Newer vaccines
(The above topics may be covered during the initial clinical posting)

New born:

Resuscitation newborn
Assessment of gestation

Low birth weight babies

Convulsions in newborn

Jaundice in newborn

(Videos may be used here)

(Approach to common problems)

a) Dyspnea ,wheezing and strider

b)Edema

c) Jaundice

d)Pallor

e)Bleeding

f)Loose stools

g)Vomiting

h) Convulsions

i)Coma

i) j)Shock

k) Weakness, limping, Excessive

cry l)Child with rash

m) Prolonged fever (demonstrate how to take, record temperature, how to interpret temperature chart

ADOLESCENCE

Adequate coverage of common problems for adolescents to be included

Pediatric surgery classes. They should report to the parent department after pediatric surgery clinical sessions

Chronic conditions in Pediatrics

**Instruments and procedures,
X-rays**

Vaccines, Growth charts, drugs, IV fluids should be shown .Common equipments should be shown during initial postings. In final year they should get chance to use and practice them. Eg nebulizers

They should be involved in simple procedures like nasogastric tube insertion, rectal drug administration etc

Students should be involved in the social activities of department eg ORS day, Immunization week; Breast feeding week .They should be given specific tasks in the conduction of the programs. If possible they may be given specific task to address a community problem .eg low vaccine coverage, how to solve?

Case Record

Separate clinical record book should be kept and at least 5 pediatric cases one newborn and one pediatric surgery cases to be written. Better to have a uniform format for case record .

Log Book

In addition to record book, a separate log book should be maintained by students to record daily activities, supervised by concerned Unit chief or Assistants.

Both case record and Log book should be compulsory.

Formative assessment.

End posting examination should be conducted at the end of clinical postings.

Three theory examinations should be conducted.

University model clinical examinations should be conducted apart from the end posting examinations and is compulsory.

Text Books Recommended

Prescribed Books

1. Essentials of Pediatrics by O.P.Ghai
2. Clinical Examination in Pediatrics by Meharban Singh
3. Hutchison's Clinical Methods
4. Clinical evaluation of new-born, infants and children by Dr. Sushama Bai
5. Care of Newborn by Meharban Singh
6. Nutrition & Child development by Dr. K. E. Elizabeth

Reference Books

Nelson Text Book of Pediatrics
IAP Text Book of Pediatrics
Social and Preventive Medicine by Park

EVALUATION

Theory examination

• **Total marks** : **100**

• **Theory**

University : **40**

Viva : **10**

Int. Asst : **10**

Total : 60

• **Practicals**

University exam : **30**

Int. Asst. : **10**

Total : 40

Theory question papers (see model question paper)

1. Structured essay should be based on a clinical scenario. The question should be structured in such a way there should not be any ambiguity.
2. This section short notes mainly on management (From Major systems and Pediatric surgery)
3. This section short notes (2 marks each, 5 questions Mainly on growth, development, nutrition, social pediatrics ,National programs
4. This section short notes (2 marks, 4 questions) Neonatology, breast feeding, immunization.

Clinical examination

Two cases

20 minutes each

First case

12.5 Marks

(System case. Common problems should be given importance)

Assessment to view child along with family, care giver concerns as a whole in discussing management

Second case -

12.5 Marks

(Assessment of nutrition, Growth, Development and Immunization.

Children without illness may also be kept for assessment).

OSCE

5 Marks

There should be three stations. Clinical scenario analysis or skill assessment stations are desirable. Out of three stations one newborn scenario is compulsory. Better avoid newborn babies as cases.

Marks

2 mark for newborn scenario

Time

1.5 marks each for other 2 stations making total 5
3 minutes for each station.

New born session may be made performance station e.g. demonstration of use of AMBU bag on a manikin or performance of initial stage of resuscitation.

SURGERY AND ITS ALLIED SPECIALITIES
(SURGERY including Paediatric Surgery)

A. GOAL

The broad goal of teaching the undergraduate medical students in Surgery is to produce graduates capable of delivering efficient first contact surgical care.

B. OBJECTIVES

1. Knowledge

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

- Describe aetiology, Pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adult and children
- Define indications and methods for fluid and replacement therapy including blood transfusion
- Define asepsis, disinfection and sterilization and recommended judicious use of

antibiotics

- d. Describe common malignancies in the country and their management including prevention
- e. Enumerate different types of anaesthetic agents, their indications, mode of administration, contraindications and side effects

2. Skills

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

- a. Diagnose common surgical conditions both acute and chronic, in adult and children;
- b. Plan various laboratory tests for surgical conditions and interpret the results;
- c. Identify and manage patients of haemorrhagic, septicemic and other types of shock;
- d. Be able to maintain patients air-way and resuscitate; i. a critically injured patient, ii. patient with cardiorespiratory failure, iii. a drowning case.
- e. Monitor patient of head, chest, spinal and abdominal injuries, both in adult and children f. Provide primary care for a patient of burns
- g. Acquire principles of operative surgery, including pre-operative, operative and post-operative care and monitoring
- h. Treat open wounds including preventing measures against tetanus and gas gangrene
- i. Diagnose neonatal and paediatric surgical emergencies and provide sound primary care before referring patient to secondary / tertiary centres
- j. Identify congenital anomalies and refer them for appropriate management
- k. To learn to Communicate with patients regarding common surgical problems, investigations and treatment.
- l. Learn to address Common ethical issues in surgical ward and OPD.

In addition to the skills referred above in items (a) to (j), he shall have observed / assisted the following:

- a. Incision and drainage of abscess
- b. Debridement and suturing open wound
- c. Venesection
- d. Excision of simple cyst and tumours e. Biopsy of surface malignancy
- f. Catheterisation and nasogastric intubation
- g. Circumcision
- h. Meatotomy
- i. Vasectomy
- J. Peritoneal and pleural aspirations
- k. Diagnostic proctoscopy
- l. Hydrocele operation
- m. Endotracheal intubation n. Tracheostomy
- o. Chest tube insertion

C. DETAILED SYLLABUS

Duration of the course: semesters -III, V, VI, VIII & IX Total

number of hours: 300

Lectures: 100.

Innovative sessions: 200

Practicals: Clinical posting as shown in the table

(Project work, Seminars, Structured discussion, integrated teaching, Formative evaluation, Revision)

DETAILS OF LECTURES

Principles of Surgery; Genetics, History of Surgery, Surgical ethics

Trauma:

- a. Metabolic Response to Trauma,
- b. Wound healing and complications,
- c. Critically injured patient including Triage
- d. ATLS, Poly Trauma, Disaster Management,
- e. Different types of wounds and their management.

Shock: Types, pathogenesis and management, Haemorrhage, Haemostasis, Blood transfusion, Burns

Fluid and Electrolyte Balance, Nutritional Support Pre-operative and post-operative care - Emphasis on Intensive care & high dependency Sterilization

Surgical sepsis -Specific infection, Nosocomial infection, Antibiotic policy

Immunology and organ transplantation, HIV and Surgeon, Hepatitis B

Principles of imaging techniques

Suture materials and Anastomosis

Skin and Soft tissues

Normal structure -Ulcers, sinus and fistula, Cysts and Benign tumours Pre malignant conditions, Malignant Tumours, Skin cover Arteries

Applied Anatomy and physiology, Investigation, Trauma, Acute ischaemia, chronic ischaemia, Arterial aneurysms and A. V. fistula, Amputations Veins

Applied Anatomy and physiology, Varicose veins and venous ulcers, DVT and superficial thrombophlebitis

Lymphatics and Lymph nodes

Applied Anatomy and Physiology, Lymphoedema-primary, Secondary, Lymph cyst -Cystic Hygroma

Inflammations - Lymphangitis, lymphadenitis, Malignant Neoplasms –lymphomas

Head and Neck

Head injuries, Facio maxillary injuries, Salivary glands, Mouth and Face, -Cleft lip, Cleft

palate, Oral cancers and premalignant conditions, Jaw tumors, ranula, Misc -Branchial cysts and fistula, Carotid body tumours.

Thyroid and Parathyroid Thyroglossal cyst and fistula Breast

Applied Anatomy and physiology, Investigation, Fibrocystic Diseases, Inflammation, Tumours

Chest

Diaphragm, Mediastinum, Chest Injuries; Thoracic outlet compression syndrome Heart and pericardium, Pleura and Lungs

Gastro Intestinal Tract

Oesophagus

Anatomy and physiology, Congenital anomalies, Dysphagia, Achalasia and other motility disorders,

Oesophageal perforation, Gastro oesophageal Reflux Diseases, Tumours Stomach and

Duodenum

Anatomy, physiology, embryology, Congenital, Peptic ulcer Disease(APD), Upper GI Haemorrhage,

Tumours, pyloric stenosis

Liver

Applied Anatomy and Physiology, Trauma, Liver Abscess, Cysts of the Liver, Portal Hypertension,

Tumours, principles and management of obstructive jaundice

Biliary system

Congenital disorders, Gall stone, Cholecystitis, Cholangio carcinoma

Spleen

Anatomy and physiology, Trauma -Splenic conservation, Indication for splenectomy

Pancreas

Anatomy, Development and Physiology, Congenital Anomalies, Acute pancreatitis, Chronic pancreatitis including calcific pancreatitis, Tumours, Surgical jaundice

Vermiform Appendix

Anatomy, Appendicitis, Neoplasm

Small and Large Intestine

Anatomy, Physiology, Embryology, Congenital disorders, Inflammatory Bowel disease including typhoid, tuberculosis, tumors, intestinal obstruction

conservative management of malignant bowel obstruction without RT aspiration and IV fluids – where surgery is not feasible. Chronic constipation

Rectum and anal canal

Ano-rectal anomalies, Prolapse, Haemorrhoids, Ano-rectal sepsis, fissure, fistula, Tumour

Miscellaneous

Abdominal trauma, Minimally invasive Surgery, Peritoneum and retroperitoneum, Hernia and abdominal wall, Mesentery, surgical audit and day care surgery

Genito urinary System

Congenital conditions, Trauma, Infection, Stones, Hydronephrosis, Tumours of kidney; Tumours

of Bladder, Retention of urine, Haematuria, Torsion, Undescended testis, Epididymo-orchitis, Carcinoma penis, Phimosis, Prostate, testicular tumours. Benign prostatic hypertrophy, carcinoma prostate, adrenal gland surgery pheochromocytoma & Conn syndrome.

DETAILS OF PRACTICALS – Clinical Postings -Ward work

Clinical Postings

8.00 -9.00 am & 12-1 PM

Theory in clinical subjects

9.00-12 noon

Case demonstration in wards/ out patient department/ Theatre

Separate clinical record book should be kept and at least twenty cases to be included. During the 24 weeks of posting in the surgical wards including OP, casualty and operating theatre during the three and a half years of posting, the students should receive instructions in principles and practice of surgery, study surgical diseases system wise and region wise including surgical anatomy, surgical pathology applied physiology, applied biochemistry, applied pharmacology and microbiology, investigations and management of surgical diseases and operative surgery. They should do physical examination and necessary investigation; maintain a record of their work, the treatment given to the patient and follow up, a minimum of 20 cases should be studied by a student during their posting each year. This should be included as part of the documents to be presented before the examination and should be valued. During their posting in eighth semester, they should attend to casualty work and observe minor operative procedures and emergency surgical procedures, management of the acute abdomen, resuscitation of the critically ill and resuscitative procedures including endotracheal intubation. Clinical teaching should include bedside clinics, demonstrations etc. of common surgical conditions found in the hospital. At the end of each posting there should be an examination conducted by the unit and these marks should be taken into account for the average examination and final assessment.

Each candidate must have at least three clinical examinations by the time he appears for the final examination.

The student should have seen the common surgical procedures and be able to identify all the commonly used instruments.

How to do an Enema, High up enema in chronic constipation, care of colostomy, rehabilitation for a patient in colostomy – a class by the colostomy care trained nurse

Student should be aware of the rights of the patient, issues like autonomy, consent etc. learn to communicate with patients regarding common surgical problems, investigations and treatment.

.Learn to address Common ethical issues in surgical ward and OPD .

Operative Surgery

Tracheostomy, gastrostomy, colostomy, suprapubic cystostomy, nephrostomy,
AK amputation, BK amputation, Trendelenburg operation, Lumbar sympathectomy,
Laparotomy, GJ and Vagotomy, Mastectomy, thyroidectomy, Eversion
TV sac, herniorrhaphy, haemorrhoidectomy, Gastrojejunostomy.
vasectomy,

Surgical instruments, suture materials and disposables

TEXT BOOKS RECOMMENDED

Prescribed Books

1. Short practice of Surgery by Bailey and Love
2. Clinical Methods in Surgery by Das
3. Operative Surgery by Das

Reference Books

1. Physical signs in Clinical Surgery by Hamilton Bailey
2. Pye's Surgical Handicraft
3. Sabiston's Text Book of Surgery
4. Text book of Surgery, Cusher
5. Synopsis of surgical Anatomy by Le Mc Gregre

SURGICAL SPECIALITIES

Lecture demonstration in surgical specialities should include Orthopaedics, Radiotherapy, Anaesthesiology, Thoracic Surgery, Plastic Surgery, Neurosurgery, Urology and Casualty.

- 1 -Physical medicine and rehabilitation by Randall L.bRADDOM
- 2 ,2 De Lisa,s Physical Medicine and Rehabilitation Principles and Practice.

ORTHOPAEDICS

A. GOAL

The broad goal of teaching the undergraduate medical students in the field of Orthopaedics is to make the students understand the basics of fractures and dislocations commonly encountered and the essential treatment needed for emergency management. The common congenital, inflammatory, metabolic, developmental, degenerative and neoplastic diseases occurring in the bones and joints should also be familiarised.

B. OBJECTIVES

1. Knowledge

- a. Explain the principles of diagnosis, first aid, management and complications of recognised bone and joint injuries.
- b. Apply suitable methods to detect and manage common infections of bones and joint
- c. Identify congenital skeletal anomalies and their referral for appropriate correction and rehabilitation

- d. Recognize metabolic bone diseases as seen in this country
- e. Explain aetiopathogenesis, manifestations, diagnosis and principles of management of neoplasms affecting bones

2. Skills

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

- a. Detect sprains and deliver first aid measures for common fractures and sprains and manage uncomplicated fractures of clavicle, Colle's fracture, phalanges etc
- b. Master techniques of splinting, plastering, immobilization etc
- c. Manage common bone infections, learn indications for amputations and corrective measures for bone deformities
- d. Advise aspects of rehabilitation for amputation, polio and Cerebral palsy

3. Application:

Be able to perform certain orthopaedic skills, provide sound advice for skeletal and related conditions at primary or secondary health care level

4. Integration

Integration with anatomy, surgery, pathology, radiology and Forensic Medicine is done.

5. Student should be aware of the rights of the patient , issues like autonomy, consent etc

6 To learn to Communicate with patients regarding common Orthopaedic problems, investigations and treatment .

7. Learn to address Common ethical issues in orthopedic ward and OPD .

C. DETAILED SYLLABUS DETAILS OF THE COURSE

Duration of the course	:	3semesters –IV , VI, & IX
Total number of hours of theory	:	100
Lectures	:	35
Innovative sessions	:	Part of clinical work
Practicals	:	Clinical postings as per schedule

(Project work, Seminars, Structured discussion, Formative evaluation, Revision)

DETAILS OF LECTURES

Traumatology

Definition of a fracture, types of fractures and general Principles of management of fractures

Complications of fractures

Open fractures and pathological fracture

Fracture clavicle

Fracture neck of humerus and shoulder dislocations

Fracture humerus (shaft) and Supracondylar fracture

Intercondylar fracture and Olecranon fracture

Elbow dislocation and forearm fracture

Monteggia fracture and Galeazzi's fracture

Colle's fracture and fracture scaphoid

Fracture spine and traumatic Paraplegia

Fracture pelvis and Hip fractures

Fracture of femur Hip dislocation and fracture shaft of femur

Meniscus tear and fracture patella

Leg fractures

Ankle injuries, (types, classification, management, complication, named fractures) Hand injuries

Extensor mechanism injuries of knee

Fracture of tarsal bones

Cold Orthopaedics

C.T.E.V and flat foot

D.D.H

Torticollis,

Congenital Pseudoarthrosis of Tibia and Arthrogryphosis multiplex congenita, Osteomyelitis, Septic arthritis

Tuberculosis –Spine, Hip, Knee, Elbow, Wrist and other sites

Perthe's disease and slipped upper femoral epiphysis Rickets and Osteomalacia

Rheumatoid arthritis and Ankylosing spondylitis

Intervertebral disc prolapse.

Scoliosis and Spondylolisthesis

Bone Tumours

Osteochondroma, Simple bone cyst, Aneurysmal bone cyst, Enchondroma, Giant cell tumour, Osteosarcoma, chondrosarcoma, Ewing's sarcoma,

Multiple myeloma, Metastatic bone diseases,

Osteogenesis Imperfecta, Nerve injuries –Radial nerve, ulnar nerve, sciatic nerve,

Amputations, Osteoarthritis Hip, Knee, Cerebral palsy.

Seminars/symposia

Symposia with clinical cases –Trauma

Fat embolism, compartment syndrome VIC

Physical Medicine and Rehabilitation,

Ankylosis,

Back pain, Commonest complaint for which patient seeks medical help

Deserves a detailed seminar – etiology, approach, management – nonpharmacological, pharmacological, restraint to order further investigations e.g. MRI scan.

Unindicated / or Investigating just for curiosity, records etc. as an important contributor to healthcare related poverty

Bone tumours (benign), Bone tumours (malignant)

DETAILS OF PRACTICALS –Clinical Posting

Nerve injuries, Deformities, Malunions, Nonunions, CTEV, Bone tumours, Traction, Splints and POP

Neuropathic pain, central and peripheral pains, phantom limb pain

Care and Management

TEXT BOOKS OF RECOMMENDED

Prescribed Books

1. Graham Apley –System of Orthopaedics
2. Fracture and Joint injuries -Watson Jones
3. Textbook of Orthopaedics-John Ebner
4. Natarajan's Text Book of Orthopaedics and Traumatology
5. Outline of orthopaedics –Adam's
6. Clinical Surgery –Das -Chapter on Orthopaedics
7. Crawford Adam's–Operative techniques (Orthopaedics)

Reference Books

1. Campbell's operative orthopaedics
2. Rockwood and Green's Fractures in adult and children
3. Turek's Orthopaedics – Principles and applications
5. Mercer's Orthopaedic Surgery

PHYSICAL MEDICINE AND REHABILITATION

One week's posting of MBBS students to Physical Medicine and Rehabilitation had been suggested during Orthopaedics / Radiology posting

1. Introduction to Physical medicine and Rehabilitation disability process and progression of disabilities concept of Impairment / Disability and handicap.
2. Principles of Physical therapy –various modalities and therapeutic exercises
3. Principles of occupational therapy its application in the rehabilitation of various disabilities
4. Principles of prosthesis, orthosis and rehabilitation aids
5. Pain management principle
- 6 To get oriented to basic principles of community based rehabilitation of people with disabilities
- 7 Learning to respect and work with paramedical professionals
- 8 Principles of electrodiagnosis,
- 9 PRINCIPLES OF REHABILITATION IN COMMON CONDITIONS LIKE PARAPLEGIA,STROKE, ARTHRITIS,PRESSURE SORE MANAGEMENT.

Text books Recommended

Text book of Rehabilitation Medicine by Howard

- 1 -Physical medicine and rehabilitation by Randall L.bRADDOM
- 2 ,2 De Lisa,s Physical Medicine and Rehabilitation Principles and Practice.

RADIOTHERAPY

A.GOAL

The broad goal of teaching undergraduate medical students in the field of Radiotherapy is to make the students understand the magnitude of the ever-increasing cancer problem in the country. The students must be made aware about steps required for the prevention and possible cure of this dreaded condition

B. OBJECTIVES

1. Knowledge

The student shall be able to:

- a. Identity symptoms and signs of various cancers and their steps of investigations and management
- b. Explain the effect of radiation therapy on humaTi beings and the basic principles involved in it

- c. Know about radio-active isotopes and their physical properties
- d. Be aware of the advances made in radiotherapy in cancer management and knowledge of various radio therapeutic equipment while treating a patient

2. Skills

At the completion of the training programme, the student shall be able to:

- a. Take a detailed clinical history of the case suspected of having a malignant disease
- b. Assist various specialists in administration of anticancer drugs and in application and use (If various radiotherapeutic equipment, while treating a patient)

C. DETAILED SYLLABUS

Duration of the course: 2 semesters -1V

Total number of hours: 20

Lectures: 7

Innovative sessions: 13

Practicals: As per schedule

(Project work, Seminars, Structured discussion, integrated teaching, Formative evaluation, Revision)

DETAILS OF LECTURES - 7 hrs

Cancer epidemiology and possible etiological factors, screening for cancer

Principles of cancer chemotherapy and chemotherapeutic agents used in the management of cancer

Hormone treatment in cancer

Principles of Radiation oncology, Radioactive Sources –Teletherapy, Brachytherapy and Nuclear

Medicine

Methods of Radiotherapy and Recent Advances

Common malignancies, Diagnosis and Treatment

Impact of radiotherapy

Understanding Symptoms and their efficient management during and after radiotherapy as prerequisite to improved compliance to complete the course

TEXT BOOKS RECOMMENDED

Prescribed Books

1. Text book of Radiotherapy by Walter and Miller

2. Flecher's Text book of Radiotherapy

Reference Books Cancer –Text book of Oncology by Devitta

ANAESTHESIOLOGY

SYLLABUS

DETAILS OF THE COURSE

Duration of the course: semester III–VIII

Total number of hours, theory: 20

Lectures: 7

Practicals: As per schedule attached

Innovative sessions: 13 Part of clinical posting
(Project work, Seminars, Structured discussion, Formative evaluation, Revision)

DETAILS OF LECTURES 20 hrs

Introduction – Scope of Anaesthesiology

Pre-anaesthetic check-up premedication

General anaesthesia –Basal Anaesthesia triads of anaesthesia Inhalational agents Intravenous Anaesthetic agents

Regional analgesia –Subarachnoid and Epidural analgesia, other techniques of regional analgesia and agents used

Equipments in anaesthesia and Methods of oxygen therapy

Intravenous fluid therapy, Intra operative monitoring

Complication in anaesthesia and post-operative period

Cardio-pulmonary & cerebral resuscitation, basic cardiac life support (BCLS), Advanced cardiac life support (ACLS)

Methods of Pain Relief

Critical care

Acute & Chronic pain therapy

Trauma care

Palliative care

DETAILS OF PRACTICALS

Practical Demonstrations: inside the theatre

1. Premedication,
2. Anaesthetic equipments,
3. IV cannulation,
4. Noninvasive & Invasive monitoring,
5. Different anaesthetic techniques,
6. Laryngoscopy, intubation,

7. Spinal and Epidural anaesthesia,
8. Regional anaesthesia,
9. Management of patient in the recovery room,
10. Resuscitation techniques,

BLS, ACLS along with when to reconsider CPR in a patient with multisystem failure
Pronging life Vs. Prolonging Death

End of Life Care Law in the country

11. Equipments –Monitoring equipments, Ventilators,
Knowing how to use an Oxygen cylinder – calculating duration of oxygen therapy based on size of the cylinder and the flow per minute Hazards of oxygen cylinder

12. Anaesthesia Machines & Workstations

13. Care of patients on ventilator,

14. Intra venous fluid therapy,

A seminar on Pain – acute, chronic, classification, management, concept of total pain
Controlled substances – essential analgesics Pain relief as Human Right

Pharmacological, non-pharmacological management
Brief introduction to choosing invasive interventions

15. Acute & Chronic Pain management

16. Trauma care

17. Palliative care

18. Critical care

TEXT BOOK RECOMMENDED

Synopsis of Anaesthesia by Alfred Lee

Basics of Anaesthesia: Stoelting & Miller

Morgan's Textbook of Anaesthesia

Indian Primer on Palliative Care

EVALUATION –SURGERY AND SPECIALITIES

General Surgery

Two papers of three hours duration with 60 marks each

Surgery paper I

Topics included

GIT, Orthopedics

Section A(General Surgery)

* Structured questions :

1+1+1+2= 5 marks

* Structured question (clinical situation) 1x3 = 3 marks

* Short essays 2x6= 12 marks

* Short notes : 5x2 = 10 marks

Total 30 marks

Section B (Orthopaedics)

1.	Essay - Structured clinical question	1x6= 6 marks
2.	Short essays	4 x 3 = 12 marks
3.	Short notes	6 x 2 = 12 marks
4.	Total	30 marks
Grand total		60 marks

Paper II –Whole of general surgery (except GIT), Anaesthesia, Radiotherapy, Dental

Surgery paper II

Topics included

General Surgery (except GIT), Anaesthesia, **Radiotherapy, Dental**

* Structured questions : 3 x 5 = 15 marks

* Essay : 1 x 5 = 5 marks

* Short Essays : 2 x 4 = 8 marks

* Short Notes : 4 x 3 = 12 marks

* Answer briefly : 10 x 2 = 20 marks

*Total **60 marks**

Total marks - 120marks

Internal assessment - 30Marks Viva

Voce - 20 marks

Total for theory - 170marks

Practical - 100 Marks

Internal assessment - 30 marks Total

for Practical - 130 Marks Total for the
subject - 300 marks

University examination

Theory

Two papers of three hours duration with 60 marks each

Surgery paper I

Topics included -GIT, -30 marks

Orthopaedics -30 marks

Surgery paper II

Topics included - Whole of general surgery (except GIT), anaesthesia, Radiotherapy, Dental-
60 marks

Total -120 marks

Scheme of Practical Examination

General Surgery: Maximum Marks: 100 Long case (Surgery) 1 x 50 = 50 marks (45 minutes)
Short case

* Surgery 1 x 20 + 5 (OSCE) = 25 marks

* Ortho 1 x 20 + 5 (OSEC) = 25 marks (10 minutes each)

Viva 20 marks (5x4 stations)

History taking - 10 marks

Clinical examination & Interpretation - 10 marks

Presentation - 5 marks

Demonstration - 5 marks

Discussion - 20 marks

(Above aspects should be strictly evaluated. Total average time for assessment of a candidate should be 10 minutes)

OSCE –is a clinical demonstration in a patient.

Points to be noted

- Introduction
- Consent
- Position of patient
- Interpretation

Oral Examination - 4 examiners

Topics to be divided and all examiners to examine each student X-rays/Histopathology slides, Instruments, Specimens and operative surgery Data analysis & Management.

OBSTETRICS & GYNAECOLOGY

Goal

The broad goal of teaching of the undergraduate student in Obstetrics & Gynaecology is to empower the student with the necessary knowledge in anatomy, physiology and pathophysiology of the reproductive system and to acquire the necessary skill to manage normal pregnancy and delivery and related problems and to diagnose and treat the common gynaecological diseases.

Objectives:

The following knowledge and theoretical skills have to be acquired by the student at the end of the course.

1. Outline the anatomy, physiology and pathophysiology of reproductive system and the common conditions affecting it, including the preventive aspects.
2. To diagnose and manage normal pregnancy including pre-pregnancy care, labour, puerperium and the problems related to these conditions.
3. To list the common causes leading to maternal and perinatal morbidity and mortality and to be aware of the remedial measures for the same.
4. Identify the use and side effects of drugs during pregnancy and to be aware of indiscriminate use of antibiotics and other drugs during obstetric & gynaecological practice.
5. To be aware of the common indications, technique and complications of usually performed operations like caesarean section, hysterectomy etc.
6. Learn the principles of contraception, and the various methods and complications of contraception, methods of medical termination of pregnancy, etc.
7. To be familiar with the various National Programmes in relation to maternal and child health, Apart from the above theoretical knowledge, the following practical skills have to be acquired at the end of the course of studies:
8. To learn to Communicate with patients regarding common gynecological problems, investigations and treatment .
9. Learn to address Common ethical issues in surgical ward and OPD .
10. To be aware of legal and ethical issues specially important for the women.
11. To be sensitive to the rights and special requirements of women in the health care scenario.
12. learn the basics of evidence based gynecology

Apart from the above theoretical knowledge, the following practical skills have to be acquired at the end of the course of studies:

- Examine a pregnant woman and diagnose abnormalities like preeclampsia, anaemia, GDM, abnormal presentations and to make appropriate referrals if necessary.
- Conduct a normal labour and to provide postnatal care.
- Resuscitation of newborn babies.
- Perform a pelvic examination and to diagnose common gynaecological diseases.
- Examine a vaginal smear for trichomonas and fungus, and to take a pap smear.
- To offer appropriate contraceptive advice to a couple, and to assist in insertion of IUCD.
- Interpret common investigation results (biochemical, histopathological, ultrasound etc)

Integration:

At the end of the training period the student must be able to provide preventive, promotive, curative and appropriate rehabilitative care of women and new born with a life cycle approach integrate activities with other departments like community medicine and paediatrics, in programmes like newborn care, immunization, nutrition, and other maternal & child health and adolescent activities

General Guidelines for training:

1. Training in the department of Obstetrics & Gynaecology with facilities prescribed by MCI, for a period of 24 weeks with due exposure to antenatal, intranatal and postnatal care and family planning and general gynaecological care
2. The student should maintain a log book for clinical postings from 3rd semester till 9th semester and frequently verified by the faculty members.
3. Of this period of clinical instruction, not less than 4 weeks be spend as resident pupil in the department.
4. During this period, the student shall conduct at least 10 normal deliveries under supervision, and assist in 10 cases including abnormal deliveries and obstetric emergencies. These cases include postnatal follow up also.
5. The student shall maintain a record of the work done in the department, get it certified from the department and submit for the Final University examination

Syllabus – Details:

Summary:

Duration of course	Postings in 5 Semesters (III, V, VI, VIII & IX)
Total number of hours:	
Theory	300
Lectures	100
Innovative sessions :	200
Clinical Work	As per the schedule attached

Innovative sessions :- must include problem based learning, seminars, structured discussions, drills eg: PPH drill, shoulder dystocia drill, eclampsia drill, emergency resuscitation in

acute collapse, New born resuscitation, Preventive Health – Education for early detection of breast lumps, Ca cervix

Video sessions – eg ; presentations of mechanism of labor, conduct of labor, common surgeries, common procedures etc

SESSIONS which will improve communication skills and attitude should be given more importance.

Details of lectures:

Pregnancy:

Diagnosis, clinical features, differential diagnosis, relevant tests and the principles underlying the tests

Antenatal care: Objectives of antenatal care routine antenatal check up, pre pregnancy care and counselling

Assessment of period of gestation, Obstetric examination, General examination, other system examination

Clinical monitoring of maternal and fetal well being, detect abnormality

Common Problems in Pregnancy:

Oedema, Pruritis, heart burn, piles, varicose veins, clothing and foot ware, Exercise, sex, hygiene

Nutrition, Rest, drug in pregnancy

Drugs: Immunization, Drug prescription relevant blood examination, urine examination and interpretation of the results & physiological changes in pregnancy Ultrasound examination

Foetal surveillance

Normal Labour

Physiology of onset of labor, fetal skull & pelvis

Mechanism of labour

Labour monitoring Partogram, **CTG** Labour analgesia

Induction of labor (various methods of induction-merits and demerits)

Acceleration of labor and drugs used in labor

Delivery:

Stages of labour, management of first of labour

Management of second stage of labour (vaginal delivery) use of restricted episiotomy

Management of third stage of labor:

Active management of third stage of labor

Prevention of PPH, Management of PPH

Other complications of third stage of labor and management immediate postpartum care, care during fourth stage of labor

Abnormal labor:

Partogram, labor abnormalities, prolonged labor, dystocia

Hypertonic contractions, hypotonic contractions and

Incoordinate uterine action

CPD, obstructed labour and Rupture uterus
Caesarean section (indications, complications)
Vaginal delivery after caesarean
Abnormal presentations and management: Occipito posterior position, Breech presentation, transverse lie, brow/ face presentation
Abortions: Types, etiopathology, investigations and management
Recurrent pregnancy loss: causes, investigations and management
Ectopic pregnancy: etiopathology, early diagnosis, late diagnosis, clinical features, differential diagnosis and principles of management (conservative, medical and surgical)
Trophoblastic diseases: aetiopathology, classification, clinical features, Diagnosis, management, long term follow up and complications
Hyperemesis gravidarum: definition, aetiopathology, clinical features advice and drug therapy
Abnormal puerperium: Cause clinical presentation investigations and management
Abnormal pregnancy, Medical Complications like hypertension, anaemia, Diabetes, Heart disease, Liver disease, Antepartum haemorrhage, abnormalities of placenta and cord, HIV in pregnancy
Multiple pregnancies
Intra uterine death
PROM (premature rupture of membranes)
Preterm labor
Post datism
IUGR
Elderly primi, Grand multipara, Rh negative, Gynaecological disorders complicating pregnancy
Fetus and new born:
Fetal distress: definition, diagnosis and management neonatal resuscitation
Care of new born, examination of new born and identifying congenital abnormalities
Jaundice in new born
Breast feeding
Contraception:
Various methods and devices, selection of patients, counselling of the Couples, follow up, side effects, complications, and failure rates, guidelines on male and female sterilisation
Medical termination of pregnancy:
MTP Act, Legal and ethical aspects, POSCO act, methods, complications and management
Operative obstetrics
Indication and steps of the procedure of episiotomy, perineal tears
Vacuum extraction, forceps delivery
Dilatation and Evacuation
Caesarean section,
Assisted breech delivery, breech extraction External cephalic version, internal podalic version Cervical encirclage extra amniotic instillation & Manual

removal of placenta

Ultrasound MRI in obstetrics: diagnostic and interventional

Fetomaternal medicine: Screening for congenital abnormalities,

Blood tests (maternal and fetal) Amniotic fluid analysis,

Foetal tissue biopsy

Medical disorders in pregnancy:

Hypertensive disorders of pregnancy

Heart diseases complicating pregnancy

Anemia in pregnancy

Diabetes in pregnancy

UTI, Hepatitis, TB- -, respiratory diseases, Chest disease complicating pregnancy

sexually transmitted diseases, Venereal disease, infections, HIV complicating

pregnancy Thyroid disorders, Immunological disorders, like SLE, APLA, and

Thrombophilia complicating pregnancy

Jaundice in pregnancy Haemorrhage and coagulation disorders in

Obstetrics & Immunology in Pregnancy

Dummy pelvis, Mannequins Resuscitation of new born

GYNAECOLOGY:

Abnormal menstruation:

Normal menstrual cycle – physiology of ovulation and menstruation

Abnormal menstruation Definition, classification, clinical features and principles of investigations, diagnosis and management

Amenorrhoea: Definition, classification, causes, investigations and management.

Abnormal uterine bleeding and Postmenopausal bleeding:

Definition, causes, investigations, and management

Hormonal therapy: when to give, when not to give, type of hormones with dosage, duration of hormonal therapy, complications and contraindications for hormonal therapy Infertility: Types, definition, causes, counselling, examination of couple and essential

investigations, ART: Various methods of assisted reproductive techniques, Setting up of ART lab including legal and ethical issues

Genital injuries including fistulae: Causes, diagnosis, Clinical features, and principles of management and prevention.

Genital infections: STDs, PID, HIV infection and AIDS, genital TB- etiopathology, diagnosis and principles of management

Vaginal hygiene, common infections,

Neoplasms of Genital tract – Benign and Malignant. Aetiopathology, Clinical features, diagnosis, principles of management, and cancer screening and preventive aspects

Abnormal vaginal discharge: Causes clinical examination, diagnosis, Investigation and

management. Counselling regarding prevention of STD's
Correction of enterocele, diagnosis and operation for vault prolapse

Endometriosis: aetiopathology, classification, clinical features, diagnosis and management of pelvic floor dysfunction

Contraception

Operative Gynaecology:

Indications, complications of D&C, Fractional curettage, Pippelle sampling, cervical biopsy

Medical termination of pregnancy Evacuation of incomplete

Abortion Tubal Ligation, IUCD insertion

Abdominal hysterectomy

Vaginal hysterectomy, Sling procedures

Ovarian tumours

Radical procedure for malignancy

Common symptoms of advanced gynec malignancy, diagnosis and management

UTI in women of different age groups, prevention and management

Endoscopy in gynaecological practice

Laparoscopy: principles, indications, instrumentation, procedure, complication, scope of laparoscopy: in gynaecological practices

Hysteroscopy: Principles, indications, instrumentation, procedure, Steps in present

Gynaecological practices and complications Colposcopy: Principles instrument, procedure

Endocrinology

Post operative management:

Routine management of postoperative patient like IV fluids, drugs, antibiotics, ambulation, nutrition

Management of fever, skin wound complications, Complications like burst abdomen, intra peritoneal bleeding, and intra peritoneal collections Instruments, Specimens etc.

Acute abdomen

Adolescent Gynaecology

Urological problems

- Pelvic Floor exercises

DETAILS OF PRACTICALS-Clinical postings-Ward/OP/OT/Labour room

8.00 – 9.00am	Lecture in clinical subjects
9.00 – 12am	Case demonstration, Clinical discussions
12.00 – 1.00 pm	Lecture in clinical subjects

Minimum one day per week is devoted for live operative Surgery demonstration and discussion

Separate clinical record should be kept and at least twenty cases to be included.

During the clinical posting in Obstetrics the student should learn History taking, Diagnosis of Normal pregnancy, physical changes in pregnancy, presentation, position, and lie etc., early pregnancy complications. Abortion, Normal labour in the labour room.

Puerperium with stress on lactation, BFHI, common ailments of pregnancy like hyperemesis, UTI, abnormal presentation, medical complications, III stage complications and abnormal puerperium

During the clinical posting in gynaecology. The student should learn History taking, examination, common symptoms, applied anatomy of genital organs, physiology of menstruation and ovulation, fibroid, Ovarian tumour, prolapse, Endometriosis, Malignancies of genital tract and Abnormal uterine bleeding. Students should be exposed to operative procedures and diagnostic procedures like ultrasound endoscopy etc..

During internment, the student should conduct at least 10 normal case and assist 10 normal cases, assist abnormal labour and attend all emergencies. The classes to be taken are palpation (review), mechanism of labour and mannequin demonstration, obstetric operations and obstetric emergencies and various obstetric drills. This period should also be used to develop proper communication skills and attitude towards female patients

Keeping records and Log books

- Each students must maintain a log book carried over from 3rd semester to 9th semester
- Structure of records to include concerns of the whole person with the disease and not just the organ
- The record book should be submitted at the time of final average practical examination. Only if the record book is submitted the candidate becomes eligible to appear for the clinical examination

Partogram should be included in the record while printing the records

FAMILY WELFARE

Applied anatomy of mechanical methods for prevention of conception

- a. In female – Barrier contraception, female condom, IUCD, tubectomy laproscopic sterilization.
- b. In male – condom, vasectomy (NSV)

Physiology, Endocrine and regulation of reproduction in the female. The safe period-rhythm method of contraception, principle of use of oral contraceptives.

Pharmacology:

Mode of action and administration of hormonal contraceptives

Contraindications for administration of contraceptives. Side effects of contraceptives.

Community Medicine: The need for Family Welfare Planning, Organization of Family Planning service, Health Education in relating to Family Planning, counselling and consent for various contraceptives, Nutrition, Physiological need of the mother, the child and the family

Demography and the vital statistics

Details of Practical

Demonstration of use of IUCD, condoms and technique of NSV

TEXT BOOKS RECOMMENDED

Prescribed Books

1. Mudaliar and Menons Clinical Obstetrics 12th edition
2. Text book of Obstetrics by D C Dutta 8th edition
3. Text book of Gynaecology by D C Dutta 4th edition
4. Shaws Text book of Gynaecology 14th edition
5. Text book of Obstetrics by Sheila Balakrishnan (Paras Publications)
6. Test Book of Gynaecology by Sheila Balakrishnan

Reference books

7. Williams obstetrics 24th edition (MacGraw Hill)
8. Essentials of Gynaecology by Dr Lekshmy Sheshadri 1st edition (Published by Lippincott, Williams & Wilkins)

Evaluation

Theory-two papers of 2hr duration 40 marks each

Paper 1-(obstetrics & social obstetrics)

Section - A

Draw & label	-	2	marks
SAQ (1marks x4)	-	4	marks
SAQ (2marks x3)	-	6	marks
Short essays (4marks x2)	-	8	marks

Section – B

Essay (problem solving)	-	10	marks
SAQ (1markx4)	-	4	marks
SAQ (3marksx2)	-	6	marks

Total - **40 marks**

Paper 2 - (Gynaecology, Family Welfare & Demography)

Section - A

Draw & Label	-	2 marks
SAQ (1markX4)	-	4 marks
SAQ (2marksX3)	-	6 marks
Short essays (4marks x2)	-	8 marks

Section –B

Essay (Problem Solving)	-	10 marks
SAQ (1mark X 4)	-	4marks
SAQ (3marks X 2)	-	6marks
Total	-	40 marks

Total (Paper I + II) 40+40 - 80 Marks

Internal Assessment	-	20marks
Viva Voce	-	30 marks
Total for Theory	-	130 marks
Practical	-	50 marks
Internal Assessment	-	20 marks

Total for Practical - 70 marks

Total for Subject - 200 marks

Practicals

Scheme of Practical Examination

Maximum Marks: 50

One obstetrics case - 25 marks

One Gynaecology case - 25 marks

Viva including record - 30 marks (5x4 stations) + 10 Record)

Clinical 1 : Long Case: 1 Case Obstetrics= 30 Min - 25 marks
(Including Writing of the Case Sheet) Clinical

2: Short Case- Gynaecology = 25 marks

Oral Exam

USG, CTG Partogram, Instruments, Family planning & Operative surgery -

20 marks

Record of delivery cases

-

10 marks

Note: These are suggested time tables. Adjustments where required, depending upon the availability of time and facility, are made. **(Institutional adjustments)**

2.12 Practical training

List of comprehensive skills

I. Clinical Evaluation:

- (a) To be able to take a proper and detailed history. Comprehensive
- (b) To perform a complete and thorough physical examination and elicit clinical signs.
- (c) To be able to properly use the Stethoscope, Blood Pressure Apparatus, Auroscope, Thermometer, Nasal Speculum, Tongue Depressor, Weighing Scales, Vaginal Speculum etc;
- (d) To be able to perform internal examination – Per Rectum (PR), Per Vaginum (PV) etc;
- (e) To arrive at a proper provisional clinical diagnosis.

II. Bed Side Diagnostic Tests:

- (a) To do and interpret Haemoglobin (HB), Total Count (TC), Erythrocyte Sedimentation Rate (ESR), Blood smear for parasites, Urine examination – albumin/ sugar/ ketone/ microscopic;
- (b) Stool exam for ova and cysts;
- (c) Gram staining and Ziehl-Nielsen staining for AFB; (d)
- (e) To do and examine a wet film vaginal smear for trichomonas;
- (f) To do skin scraping and Potassium Hydroxide (KOH) stain for fungus infections; (g)
- To perform and read Mantoux Test.

III. Ability to carry out Procedures:

- (a) To conduct CPR (Cardiopulmonary resuscitation) and First aid in newborns, children and adults;
- (b) To give Subcutaneous (SC)/ Intramuscular (IM)/ Intravenous (IV) injections and start Intravenous (IV) infusions;
- (c) To pass a nasogastric tube and give gastric lavage;
- (d) To administer oxygen – by mask/ catheter;
- (e) To administer enema

- (f) To pass a urinary catheter – male and female;
- (g) To insert flatus tube;
- (h) To do pleural tap, ascitic tap & lumbar puncture;
- (i) Insert intercostals tube to relieve tension pneumothorax; (j) To relieve cardiac tamponade;
- (k) To control external haemorrhage.

IV. Anaesthetic Procedures:

- (a) Administer local anaesthesia and nerve block;
- (b) Be able to secure airway patency and administer Oxygen by Ambu bag;

V. Surgical Procedures:

- (a) To apply splints, bandages and Plaster of Paris (POP) slabs; (b) To do incision and drainage of abscesses;
- (c) To perform the management and suturing of superficial wounds;
- (d) To carry on minor surgical procedures, e.g, excision of small cysts and nodules, circumcision, reduction of paraphimosis, debridement of wounds etc;
- (e) To perform vasectomy;
- (f) To manage anal fissures and give injections for piles.

VI. Mechanical Procedures:

- (a) To perform thorough antenatal examination and identify high risk pregnancies;
- (b) To conduct normal delivery;
- (c) To apply low forceps and perform and suture episiotomies;
- (d) To insert and remove IUDs and perform tubectomy.

VII. Paediatrics:

- (a) To assess new born and recognize abnormalities and intra uterine retardation;
- (b) To conduct immunization;
- (c) To teach infant feeding to mothers;
- (d) To monitor growth by the use of “road to health chart” and to recognize development retardation;
- (e) To assess dehydration and prepare and administer Oral Rehydration Therapy (ORT); (f) To recognize acute respiratory infection clinically.

VIII. ENT Procedures:

- (a) To perform nasal packing of epistaxis; (b) To perform tracheostomy;

IX. Ophthalmic Procedures.

- (a) To evert eye-lids;
- (b) To give Subconjunctival injection; (c) to perform epilation of eye-lashes;
- (d) To measure the refractive error and advice correctional glasses;
- (e) to perform nasolacrimal duct syringing for patency.

X. Dental Procedures.

- (a) To perform dental extraction.

XI. Community Health.

- (a) To be able to supervise and motivate community and para-professionals for corporate efforts for the health care;

- (b) To be able to carry on managerial responsibilities; e.g. Management of stores, indenting and stock keeping and accounting;
- (c) Planning and management of health camps;
- (d) Implementation of national health programmes;
- (e) To effect proper sanitation measures in the community; e.g. disposal of infected garbage and chlorination of drinking water;
- (f) To identify and institute control measures for epidemics including its proper data collecting and reporting.
- (g) Understand the local social capital in communities and their role in community health – Local Self Governance bodies, Village Health Committees, ASHA workers, Women, School teachers, elders, local leaders.

XII. Forensic Medicine including Toxicology.

- (a) To be able to carry on proper medicolegal examination and documentation of injury and age reports;
- (b) To be able to conduct examination for sexual offences and intoxications;
- (c) To be able to preserve relevant ancillary materials for medicolegal examination; (d) To be able to identify important post-mortem findings in common un-natural deaths;

XIII. Management of Emergencies.

- (a) To manage acute anaphylactic shock;
- (b) To manage peripheral vascular failure and shock;
- (c) To manage acute pulmonary oedema and left ventricular failure; (d) Emergency management of drowning, poisoning and seizures;
- (e) Emergency management of bronchial asthma and status asthmatics; (f) Emergency management of hyperpyrexia;
- (g) Emergency management of comatose patients regarding airways, positioning – prevention of aspiration and injuries;
- (h) Assess and administer emergency management of burns

XIV Communication skills

- (1) To take the history and do examinations addressing the patients basic rights and sensitivities .
- (2) To document the findings properly
- (3) To communicate patients problems and findings to the seniors and colleges
- (4) Communicate well with the patient and the relatives/LAR
- (5) Develop empathy and therapeutic relationship to the patient
- (6) To address situations like counselling grief, angry patient, disclosure of bad news, managing crowd etc

XV Bio ethics

1. To list basic principles of medical ethics
2. To identify and relate these principles to real life scenarios

2.13 Records

Present in clause 2.10.

2.14 Dissertation: As per Dissertation Regulations of KUHS

Not applicable.

2.15 Speciality training if any

Clinical posting schedule in various departments

SUBJECT	SEMESTERS									TOTAL WEEKS
	III	IV	V	EXAM	VI	VII	EXAM	VIII	IX	
Gen Medicine	8		2	X	4		X	8	4	26
Paediatrics				X	2		X	4	4	10
TB & chest		2		X			X			2
Skin & VD		2	4	X			X			6
Psychiatry		2		X			X			2
*Radiology			2	X			X			2
****Gen. Surgery	8		2	X	4		X	8	4	26
**Orthopaedics		2		X	4		X		4	10

Ophthalmology		4		X		6	X			10
Otorhinolaryngology		2		X		6	X			8
O&G &FP	8		2	X	6		X	4	4	24
Comm. Medicine		2	4	X		6	X			12
***Casualty/ Clip		2		X			X			2
Dentistry			2	X			X			2
Total in Weeks	24	18	18	8	20	18	8	24	20	142

* This posting includes training in Radiodiagnosis and Radiotherapy where existent.

** This posting includes exposure to Rehabilitation and Physiotherapy.

*** The clinical pathology posting will from 8 A.M. To 12 noon.

The rest of the day, excluding afternoon theory classes will be casualty posting.

The Casualty/clinical pathology posting includes exposure to laboratory medicine and infectious diseases.

**** This posting includes exposure to wound dressing and Anaesthesia.

2.16 Project work to be done if any

As stipulated by HoD

2.17 Any other requirements [CME, Paper Publishing etc.]

Not applicable

2.18 rescribed/recommended textbooks for each subject

Present in clause 2.10.

2.19 Reference books

Present in clause 2. 10 content of each subject in each year.

2.20 Journals

Present in clause 2.10 content of each subject in each year.

2.21 Logbook

Not applicable.

3.EXAMINATIONS

3.1 Eligibility to appear for exams

A student who has secured 35% marks for internal assessment in theory, practical/clinical separately is qualified to appear for university examination provided he/she satisfies that percentage of attendance requirement as said already.

3.2 Schedule of Regular/Supplementary exams

The Supplementary examination for First Professional MBBS Examination may be conducted within 6months after publication of result so that the students who pass will continue as an additional batch of students and the failed students will have to appear in the subsequent year.

3.3 Scheme of examination showing maximum marks and minimum marks

Sl. No.	Subject	Theory Paper	Theory PaperII	IA	Oral	Total T+IA+O	Practical	IA	Total	Subject
1.	Anatomy	50	50	20	20	140	40	20	60	200
2.	Physiology	50	50	20	20	140	40	20	60	200
3	Biochemistry	50	50	20	20	140	40	20	60	200
4.	Pharmacology	40	40	15	15	110	25	15	40	150
5.	Pathology	40	40	15	15	110	25	15	40	150
6	Microbiology	40	40	15	15	110	25	15	40	150
7.	Forensic Medicine	40		10	10	60	30	10	40	100
8.	Ophthalmology	40		10	10	60	30	10	40	100
9.	Otorhinolaryngolog	40		10	10	60	30	10	40	100
10	CommunityMedicin	60	60	20	10	150	30	20	50	200
11	General Medicine	60	60	30	20	170	100	30	130	300
12	General Surgery	60	60	30	20	170	100	30	130	300
13	Obstetrics & Gynaecology	40	40	20	30	130	50	20	70	200
14	Pediatrics	40		10	10	60	30	10	40	100

3.4 Papers in each year

First year

2. Anatomy Paper I
3. Anatomy Paper II
4. Physiology Paper I
5. Physiology Paper II
6. Biochemistry Paper I
7. Biochemistry Paper II

Second year

1. PHARMACOLOGY- Paper I
2. PHARMACOLOGY- Paper II
3. PATHOLOGY Paper I CLINICAL PATHOLOGY AND GENERAL PATHOLOGY-
4. PATHOLOGY Paper II HAEMATOLOGY AND SYSTEMIC PATHOLOGY
5. MICROBIOLOGY- Paper I – General Bacteriology, Immunology, Systematic Bacteriology
6. MICROBIOLOGY Paper II – Clinical Microbiology, Parasitology, Mycology & Virology
7. FORENSIC MEDICINE & TOXICOLOGY

Third year Part 1

1. Ophthalmology
2. Otorhinolaryngology
3. Community Medicine- Paper I
4. Community Medicine- Paper II

Third year Part II

1. Gynaecology (Family Welfare and Demography – II
2. Pediatrics and Neonatology
3. Obstetrics & Social Obstetrics - I
4. General Surgery – I
5. General Surgery – II
6. General Medicine – I
7. General Medicine –Paper II

3.5 Details of theory exams

The medical colleges under the University will be divided into 6 zones. The distribution of Zone are as follows: -

- i. Zone A: All medical colleges in Thiruvananthapuram and Kollam districts.
- ii. Zone B: All medical colleges in Kottayam, Idukki and Pathanamthitta districts.

- 111. Zone C: - All medical colleges in Ernakulam and Alappuzha districts.
- 112. Zone D: - All medical colleges in Thrissur and Palakkad districts.
- 113. Zone E: - All medical colleges in Kozhikode, Wayanad and Malappuram districts.
- 114. Zone F: - All medical colleges in Kannur and Kasaragod districts.

The examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimum skills, along with clear concepts of the fundamentals which are necessary for him/her to carry out his/her day to day work competently. Evaluation will be carried out on an objective basis. An examination calendar should be prepared with designated dates for all internal and University Examinations by the University/ Institutional Curriculum Committee every year.

The theory question papers will be designed in such a way that the questions include structured essays, short answer questions. The theory papers in pre and paraclinical subjects will be given due weightage to the applied aspects and clinical subjects will include questions based on basic sciences also. The present pattern of question papers is provided along with subject wise syllabus given in part II.

The Practical / clinical examination will be conducted in the laboratories or hospital wards. Objective will be to assess proficiency in skills, conduct of experiment, interpretation of data and logical conclusion. Clinical cases should preferably include common diseases the student is likely to come across in practice. Rare cases/obscure syndromes, long cases of neurology etc. shall not be kept for the final examination. Emphasis should be on candidate's capability in eliciting physical signs and their interpretation. Practical examination should be objective and should test skills and ability to interpret the results.

Structured evaluation should be done. OSCE (Objective Structured Clinical Examination) should be incorporated in the practical examinations. Viva/ oral include evaluation of management approach and handling of emergencies.

Candidate's skill in interpretation of common investigative data, x-rays, identification of specimens, ECG, etc. also is to be evaluated.

3.6 Model question paper for each subject with question paper pattern

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BIOCHEMISTRY :MODEL QUESTION PAPER

PAPER 1

Answer to all questions; Draw diagrams wherever necessary

Essay

(10 Marks)

1. Explain the hormonal regulation of plasma glucose .Enumerate the major metabolic abnormalities in diabetes mellitus .Indicate the criteria for diagnosing a case of Diabetes mellitus.What are the common clinical features of diabetes mellitus?(4+ 3+2+1 = 10 marks)

2. **Short essay**

(2 x5 =10)

2.Disposal of ammonia from body .Add a note on disorders of Hyperammonemia

3.Beta oxidation fatty acids

Short notes

(5 x3 = 15)

4.Phenylketonuria

5. Depict electron transport chain

6. Secondary structure of proteins

7. Competitive enzyme inhibition

8. Anaplerotic reactions of TCA cycle

Give Biochemical basis of

(5x2 =10)

9 .Fluoride as a blood preservative for glucose estimation

10. Darkening of voided urine in cases of alkaptonuria

11. Congenital cataract in galactosemia

12. Carbohydrates cannot be formed from fat

13. LDL is considered as “bad” cholesterol fraction.

Answer to the point

(5x1 =5)

14.Enzyme defect in MSUD

15.Insulin dependent glucose transporter

16.Two examples for mucopolysaccharidosis

17.Precursor amino acid of NO in the body

18.Two essential fatty acids

PAPER 2

Answer to all questions; Draw diagrams wherever necessary

(Total marks = 50)

Essay

(10 Marks)

1. Explain the renal regulation of pH . What are the laboratory data required for assessing acid base status of a patient? Give two causes of high anion gap metabolic acidosis (5 + 3+ 2=10 Marks.)

Short essay

(2 x5 =10)

2. PCR technique and its applications in clinical medicine

3. Dietary sources, RDA, absorption, transport & storage of iron Add a note on causes of iron deficiency

Short notes

(5 x3 = 15)

4. Missense mutation with an example

5. Manifestations of vitamin D deficiency

6. Types of Jaundice and differential diagnosis by laboratory tests

7. Outline the pathway of purine degradation

8. Outline transcription in prokaryotes

Give Biochemical basis of

(5x2 =10)

9. Chronic lead exposure causes anaemia 10. Reversal of AG ratio in severe cases of cirrhosis liver

11. The apolipoproteins, apo B₄₈ & apo B₁₀₀ formed from a common gene

12. High serum TSH in secondary hypothyroidism

13. Night blindness in vitamin A deficiency

Answer to the point

(5x1 =5)

14. Two oncogenic viruses

15. Two causes of hyponatremia

16. Serum creatinine level in healthy adults

17. Defect in Wilson's disease

18. Active form of methionine

MODEL QUESTION PAPER
First Professional MBBS Degree Examination
PHYSIOLOGY
Paper - I

Time: 3 hrs

Max marks: 50

Instructions:

Draw diagrams wherever necessary
Answer all questions.

1. A 40 years old obese women, complained of repeated attacks of right hypochondrial pain and yellow coloration of eyes. Her serum bilirubin -15mg/dl Vanderberg test was direct positive and serum alkaline phosphatase was 50 IU.

- I. Give the most appropriate name of this clinical condition.
- II. What is the life span of RBC and how do you measure it ?
- III. List the steps of breakdown of Hemoglobin

(1+3+6=10 marks)

Short Essay:

2. Discuss the factors affecting Glomerular Filtration Rate. Mention one abnormal condition when GFR is decreased
3. Explain the transport of Carbondioxide in blood

(4+1=5 marks)

(5 marks)

Write briefly on:

4. Function of Large intestine
5. Gastric emptying
6. Formation and functions of Lymph
7. Micturition Reflex
8. Role of Hypothalamus in Temperature regulation

(5x3=15 marks)

Draw and label:

9. Normal E C G in Lead II
10. Juxtaglomerular apparatus

(2x2½ =5 marks)

Explain the physiological basis of the following:

11. Post prandial alkaline tide
12. Clotting of blood does not occur In-vivo normally
13. Coronary arteries are perfused during diastole
14. Hypersmolarity of renal medullary interstium
15. Lung alveoli are kept dry normally

(5x2=10 marks)

MODEL QUESTION PAPER
First Professional MBBS Degree Examination
PHYSIOLOGY
Paper - II

Time: 3 hrs

Max marks: 50

Instructions:

- ☐ Draw diagrams wherever necessary
- ☐ Answer all questions.

1. A 60 year old man was brought to the casualty with the complaints of sudden onset of inability to move his right upper limb and lower limb. He gave a history of treatment for hypertension since 10 years. On examination he presented with-
 - I. Hemiplegia with UMN facial nerve palsy of the right side
 - II. Name the tract affected in this patient
2. Mention the most probable site of lesion
 - V. State the differentiating features of Upper Motor Neurons and Lower Motor Neuron lesions
 - VI. Comment on the tone of the muscles of the affected side

(1+1+4+2+2=10 marks)

Short Essay:

2. Give an account of visual pathway. What is the effect of a lesion of right optic tract?
3. Discuss the hormonal regulation of blood calcium level

(2x5=10 marks)

Write briefly on:

4. Pathway of pain from the face
5. Theories of hearing
6. Role of nigrostriatal pathway in regulating cortical activity
7. Hormonal control of lactation
8. Second Messengers

(5x3=15 marks)

Draw and label:

9. Organ of Corti
10. Hormonal changes during normal menstrual cycle.

(2x2½ =5 marks)

Explain the physiological basis of the following:

11. Babinski's sign in new born
12. Polyuria in diabetes mellitus
13. Phantom limb
14. Dark adaptation
15. Presbyopia

(5x2=10 marks)

Paper –I

Time: 3 hrs

ANATOMY

Max marks: 50

Instructions:

- Draw diagrams wherever necessary
- Answer all questions.

1. A 70 year old man on walking uphill feels sudden onset of severe chest pain radiating to the medial side of left arm associated with tiredness and sweating. He gives a history of similar attacks and was on treatment. With your knowledge in Anatomy answer the following questions.

Name the organ affected

Give a brief account of its arterial supply.

Mention the reason for the radiation of pain.

Name the covering of the organ and give their nerve supply.

(1+4+2+3=10 marks)

Write briefly on:

2. Inversion and eversion of foot
3. Bronchopulmonary segments of right lung
4. Radioulnar joints

(3x5=15 marks)

Write notes on:

5. Decidua
6. Medial longitudinal arch of foot
7. Clavipectoral fascia
8. Coronary sinus
9. Rotator cuff

(5x3=15 marks)

Write short answers on :

10. Enumerate the derivatives of neural crest
11. Down's Syndrome
12. Microscopic structure of lymph node

(3x2=6 marks)

Draw neat labelled diagram of the following:

13. Sagittal section through the shoulder joint
14. Sternocostal surface of heart

(2x2=4 marks)

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MODEL QUESTION PAPER
First Professional MBBS Degree Examination

Paper -II ANATOMY

Time: 3 hrs

Max marks: 50

Instructions:

Draw diagrams wherever necessary
Answer all questions.

1. A 10 year old boy was brought to the O.P with fever and difficulty in opening his mouth and chewing. On examination there was a swelling in front of his left ear associated with tenderness. Based on your knowledge in Anatomy answer the following questions.

Name the structure affected in this case

Describe the coverings, surfaces and borders of the structure Mention the structure traversing it

Give the nerve supply of the structure

(1+5+2+2=10 marks)

Write briefly on:

3. Ischiorectal fossa
4. Constituent fibres and arterial supply of internal capsule
5. Development and congenital anomalies of palate. **(3x5=15 marks)**

Write notes on:

5. Superior constrictor muscle
6. Auditory tube
7. Lateral geniculate body
8. Microscopic structure of retina
9. Superior mesenteric artery **(5x3=15 marks)**

Write short answers on:

10. Enumerate the arteries and nerves supplying anterior quadrant of scalp
11. Meckel's diverticulum
12. Coverings of prostate gland **(3x2=6 marks)**

Draw neat labelled diagram of the following:

13. Structures seen posterior to the stomach

14. Transverse section through upper part of midbrain(2x2=4 marks)

QP Code:

Reg. Number:

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Second Professional MBBS Degree Examination

(MODEL QUESTION PAPER)

FORENSIC MEDICINE & TOXICOLOGY

Time: 2 hrs

Max marks: 40

Answer all questions.

Draw diagrams wherever necessary

Essay: (7)

1. A 23 year old girl was brought to casualty with history of vomiting after consuming a fruit which looked like an unripe mango with fibrous covering enclosing a kernel. Pulse was irregular and weak. She died soon after. Answer the following questions. What was she suffering from .

What are the ingredients of the poisonous fruit consumed

. How will you confirm the diagnosis .

What is the likely cause of death in such cases .

(2+2+2+1=7)

(5x3=15)

Short notes:

2. External autopsy findings in death due to hanging

3. Cardiovascular causes of sudden death

4. Causes of impotence in men

5. Age estimation from single tooth

6. Battered baby syndrome

(5x2=10)

Answer briefly

7. Dying declaration

8. Algor mortis

9. Ingredients required for proof of negligence

10. Disputed paternity

11. Privileged communication

Differentiate between

(2x2=4)

12. True and feigned insanity

13. Entrance and exit wounds of firearm discharge

Draw & Label

(2x2=4)

14. Human spermatozoa

15. Gastric lavage tube

QP Code:

Reg. Number:

Second Professional MBBS Degree Examination

(MODEL QUESTION PAPER)

MICROBIOLOGY- Paper I

Time: 2 hrs

Max marks: 40

Answer all questions.

Draw diagrams wherever necessary

Essay: (10)

1. Read the clinical history and answer the following questions.:

A 30 year old male comes to the Medical O.P with complaints of fever of 2 weeks duration. He has dry cough & weight loss .X-Ray reveals area of consolidation in the apex of the right lung.

Mention the probable diagnosis and source of infection..

List the specimens to be sent for laboratory diagnosis in this case.

How will you proceed with laboratory diagnosis in this case.

How can the disease be prevented.

Mention the skin test done routinely for the diagnosis. Discuss the interpretation.

(1+1+4+2+2=10)

(2x5=10)

Short essays:

2. Pathogenesis and lab diagnosis of cholera

3. Type I hyper sensitivity reaction

Short notes:

(10x2=20)

4. Clostridium difficile

5. Inspissation

6. Bacterial growth curve

7. Null cells

8. Transport medium

9. Legionella pneumophila

10. TRIC agents

11. Scrub typhus

12. Methicillin-resistant staphylococcus aureus (MRSA)

13. Coliform count

QP Code:

Reg. Number:

Second Professional MBBS Degree Examination

(MODEL QUESTION PAPER)

MICROBIOLOGY- Paper II

Time: 2 hrs

Max marks: 40

Answer all questions.

Draw diagrams wherever necessary

Essay: (10)

1. Read the clinical history and answer the following questions:

A 50 year old male presented with low grade fever of one month duration. He had fatigue and loss of appetite. O/E there was hepatomegaly and yellowish discolouration of sclera. He gives a history of blood transfusion three months back.

What is the probable diagnosis and causative agent.

What is the pathogenesis.

Which are the serological markers which will help in the diagnosis and assessment

of severity of the disease.

What is the prophylaxis.

How do you treat this patient.

Name four viruses transmitted through blood transfusion.

(1+2+3+2+1+1=10)

Short essays:

(2x5=10)

2. Kala azar

3. Entamoeba histolytica

Short notes:

(10x2=20)

4. Rhinosporidiosis

5. Prions

6. Cryptococcus neoformans

7. Tzanck smear

8. Hydatid cyst

9. Highly active anti retroviral therapy (HAART)

10. Pneumocystis jiroveci

11. Occult filariasis

12. Pathogenesis of dengue virus infection

13. Trichomonas vaginalis

QP Code:

Reg. Number:

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Second Professional MBBS Degree Examination

(MODEL QUESTION PAPER)

CLINICAL PATHOLOGY AND GENERAL PATHOLOGY- Paper I

**Time: 2
hrs**

Max marks: 40

Answer all questions.

Draw diagrams wherever necessary

Essay: (8)

1. Define inflammation. Describe briefly the cellular and humoral mediators of inflammation. Mention the different morphological patterns of acute inflammation with examples. (1+4+3=8)

Short essay: (6)

2. A 50 year old man developed sudden chest pain with vomiting. He was dysnoeic. O/E he was febrile. ECG- showed ST elevation and T wave inversion. TC- 15,200/cmm, ESR: 40mm/hr. The patient died 12 hours later.

- What is your diagnosis and mention the reason
- What are the lab.investigations to be done at the time of admission.
- Describe the gross and microscopic features of the organ primarily involved .
- List four major complications.

(1+2+2+1=6)

(4x4=16)

Short notes:

3. Pathogenesis of reversible cell injury.
4. Blood grouping and cross matching.
5. Routes of metastasis.
6. CSF examination.

Answer briefly

(4x2=8)

7. Ghons complex.
8. Ketonuria
9. Scurvy
10. Fat embolism

Answer in single sentence

(4x½ =2)

11. Define metaplasia.
12. List two infective ulcers of the intestine
13. Define Type II hypersensitivity reaction.
14. Mention two tests for proteinuria

QP Code:

Reg. Number:

**Second Professional MBBS Degree Examination
(MODEL QUESTION PAPER)**

HAEMATOLOGY AND SYSTEMIC PATHOLOGY- Paper II

Time: 2 hrs

Max marks: 40

Answer all questions.

Draw diagrams wherever necessary

Essay: (8)

1. Classify tumors of the lung. Briefly discuss the etiopathogenesis of carcinoma of lung. Describe the gross and microscopy of the most common malignant tumour of lung. (2+3+3=8)

Short essay: (6)

2. A 15 year old male, presented with fever, sore throat, cervical lymph node enlargement. Investigations: TC 14,000/cmm, DC-p20L75E5. Peripheral smear-No immature cells seen.

- What is your diagnosis.
- Describe the characteristic peripheral smear findings.
- Mention the etiology of this condition.
- Mention the test to confirm the diagnosis.
- Name two organs involved in this condition

(1+2+1+1+1= 6)
(4x4=16)

Short notes:

3. Etiopathogenesis of peptic ulcer.
4. Lab. Investigations in multiple myeloma
5. Medullary carcinoma of thyroid.
6. Paget's disease of bone.

(4x2=8)

Answer briefly

7. Peripheral smear findings in megaloblastic anaemia
8. List the hepatocyte changes in acute viral hepatitis.
9. Classification of renal cell carcinoma
10. Sideroblasts in bone marrow

(4x½ =2)

Answer in single sentence

11. MEN type-I
12. Mott cell.
13. Caplan's syndrome.
14. Schiller- Duval body

MODEL QUESTION PAPERS

Second Professional M B B S Examination

Pharmacology - Paper I

Time : 2 hrs

Marks : 40

- Answer all questions
- Draw diagrams wherever necessary

Essays: (2x5=10)

1. A 30 year old woman presents with unilateral pulsatile headache associated with nausea and vomiting in the neurology OPD. The headache had started after a night shift. She gives similar history of headache for the past 6 months. Patient was diagnosed as having an attack of acute migraine.
 - a. Outline the drugs used in treatment of acute migraine.
 - b. How will you manage a case of acute migraine? Give the mechanism of action, adverse effects and contraindication for any one of the drugs used.
 - c. Enumerate the drugs used in prophylaxis of migraine with rationale of using any one group.
(1 ½ + 2 + 1 ½)
2.
 - a. Enumerate the antipsychotic drugs. Write the mechanism of action and adverse effects of any one drug.
 - b. What are the advantages of atypical antipsychotics over typical antipsychotics?
 - c. Which class of antipsychotics is preferred in a patient with Parkinsons disease and why?
(2 + 1 ½ + 1 ½)

Short notes: (4x3=12)

3. Anti cholinesterases
4. Inhalational corticosteroids
5. Halothane
6. Amiodarone

Give reasons for the following: (5x1=5)

7. Rationale for combining beta blockers with nitroglycerine in chronic stable angina.
8. Morphine in acute left ventricular failure.
9. Low dose aspirin in myocardial infarction.

10. Plasma drug monitoring in a patient on Digoxin therapy for treatment of heart failure.
11. Fluoxetine as antidepressant drug instead of amitriptyline.

Give two uses and two adverse effects specific to the drug: (4x1=4)

12. Propranolol
13. Phenytoin
14. Heparin
15. Frusemide

Choose the drug and justify: (5x1=5)

16. Alpha blockers or beta blockers in unstable angina
17. Pilocarpine or Timolol in open angle glaucoma
18. Clonazepam or phenobarbitone as hypnotic
19. Diclofenac or Allopurinol in acute gout
20. Methadone or Naloxone in opioid addicts

Name two drugs ($\frac{1}{2} \times 8 = 4$)

21. Disease modifying antirheumatic drugs (DMARDs)
22. Intravenous anaesthetics
23. Mast cell stabilizers
24. Antidiuretic drugs
25. Hypolipidemic drugs from two different groups
26. Cognition enhancers
27. Antimanic drugs from two different groups
28. Central skeletal muscle relaxants from different groups.

Pharmacology - Paper II

Time : 2 hrs

- Answer all questions
- Draw diagrams wherever necessary

Marks : 40

Essays: (2x5=10)

1. A 43 year old female presented to the casualty with drowsiness, fever, abdominal pain and vomiting. She was a known case of type I diabetes mellitus on treatment with insulin since the age of 10 years. She had a history of upper respiratory infection two days back. On examination she was tachypnoeic and temperature of 39°C was recorded. Lab investigations revealed RBS of 340mg% and urine was ketone bodies positive. A diagnosis of diabetic ketoacidosis was made.

Outline briefly the management of Diabetic ketoacidosis.

b. Enlist the different groups of oral antidiabetic drugs. Add a note on mechanism of action of sulfonylureas

c. Enumerate the advantage of newer insulin analogues over conventional insulin.

(2 + 2 + 1 =5)

2. Classify the drugs used in the treatment of peptic ulcer. Add a note on proton pump inhibitors. Enlist the various antimicrobial agents used in the treatment of H pylori infection.

(1 ½ +2+1 ½ =5)

Short notes: (4x3=12)

3. Echinocandins

4. Vinca alkaloids

5. Third generation cephalosporines

6. Chloroquine

Give reasons for following : (5x1=5)

7. Combining estrogen and progesterone in oral contraceptive pills.

8. Thalidomide in the treatment of lepra reaction.

9. Bisphosphonates in treatment of osteoporosis

10. Why penicillin is not combined with tetracycline in the treatment of pneumococcal infection?

11. Folinic acid in methotrexate toxicity

Specify the mechanism of action of the following drugs: (3x1=3)

12. Vancomycin

13. Methotrexate

14. Tamoxifen

Specify the spectrum (highly susceptible bacteria) for the following agents (2x1= 2)

15. Aminoglycosides

16. Azithromycin

Give two uses and two specific adverse effects for the following drugs (4x1 = 4)

17. British antilewisite(BAL)

18. Cyclophosphamide

19. Prednisolone

20. Vinca alkaloids

Name two drugs (1/2 x 8 = 4)

21. Tocolytics
22. Treatment of neutropenia
23. Treatment of scabies
24. Prophylaxis of HIV
25. Anti influenza drugs (two different groups)
26. Prophylaxis of malaria
27. Live viral vaccines
28. Treatment of MDR TB

Q.P.Code:

Reg. no.:

Third Professional MBBS Part I Degree Examinations

(Model Question Paper)

Time: 3 Hours

Community Medicine- Paper I

Total Marks: 60

- Answer all questions
- Draw diagrams wherever necessary

Essay: (10)

1. Rahul 7th semester MBBS student while doing his community medicine stay posting in a rural CHC, observed that there are around 25% low birth weight among newborns during 1st quarter of 2013. He decided to find out risk factors of low birthweight. Answer the following:

- What is the type of study design he should use if study has to be completed during the posting and mention reasons
- State the objectives of study
- Mention the methodology of study
- How will you analyze the data

Problem:

2. As a MO of PHC, what are the strategies you will plan to prevent and control malnutrition among children under five years in your area.

(2+1+5+2=10)

(2x5=10)

3. List down therapeutic diet for 35 years old male with stage I hypertension whose height is 170cm, weight is 90kg and total cholesterol is 350 mg/dL

Short answer Question:

(5x4=20)

4. Social security measures
5. Categories of bio medical waste management and color code used for disposal
6. Surveillance of drinking water quality
7. Emergency contraception

8.Occupational cancer and its control

Differentiate between:

(3x2=6)

9.Food fortification and food adulteration.

10. Health education and health propaganda.

11. Point source epidemic and common source multiple exposure epidemic

Substantiate your answer with reasons:

(2x2=4)

12. Primary prevention is a “holistic approach” in prevention of disease.

13. Integrated vector management is the most effective method of vector control

List the following: (5x2=10)

14. Uses of epidemiology.

15. Importance of incubation period.

16. Steps in randomized controlled trial.

17. Control of reservoir.

18. Levels of prevention and mode of intervention in each

Third Professional MBBS Part I Degree Examinations
(Model Question Paper)
Community Medicine- Paper II

Time: 3 Hours

Total Marks: 60

- Answer all questions
- Draw diagrams wherever necessary

Essay: (10)

1.Raju 12 years old boy, bitten by a stray dog and was brought to you. On examination there were 2 lacerated wound on the right leg and small abrasions on left leg. Dog was killed. Answer the following:

- Which category the exposure belongs
- List the classification of animal bite exposure
- Mention the management of this case
- Explain the strategies of prevention of rabies in India

(1+2+3+4=10)

Problem:

(2x5=10)

2.Riya 3 years old girl who is attending nearby anganwadi was brought to your PHC with H/o fever for 5 days and rashes all over the body for 1 day. She is partially immunized. As MO How will you manage the situation.

3.As MO of the PHC you are asked to prepare a project for implementing geriatric care(both IP & OP services) in your hospital by the panchayat. Describe the project

Short answer Question:

(5x4=20)

- 4.Malaria treatment policy 2010
- 5.Dots plus
- 6.Nutritional rehabilitation centre's
- 7.Green hospital concept
- 8.District mental health programme

Differentiate between:

(3x2=6)

- 9.Stable & unstable malaria
10. Cost benefit and cost effective analysis
11. Type I & type II reaction in leprosy

Substantiate your answer with reasons:

(2x2=4)

12. Targeted interventions are important components of HIV prevention.
13. Integrated approach for prevention of non communicable disease- need of the hour

List the following:

(5x2=10)

14. Legislations related to occupational health
15. Phases in disaster management
16. Steps in planning cycle
17. Challenges to urban health
18. Emerging diseases causing threat to global health

सर्वे भवन्तु सुखिनः

Q.P.Code:

Reg. no.:

Third Professional MBBS Part I Degree Examinations
(Model Question Paper)

Ophthalmology

Time: 2 Hours

Total Marks: 40

- Answer all questions
- Draw diagrams wherever necessary

Essay: (10)

1.A 60 years old short statured female presented in the casualty with history of suddenonset of very severe pain in the right eye with redness and marked impairment ofvision in the same eye. She is also having systemic symptoms of headache andvomiting. She gives history of seeing colored haloes in the past. Answer the following :

- What is your more probable diagnosis
- What is the differential diagnosis
- What are the clinical features of the condition
- How will you confirm the diagnosis
- How will you manage the case

(1+2+2+2+3=10)

Short notes:

- 2.Congenital cataract
- 3.Management of uveitis
- 4.Myopia
- 5.Vitamin A deficiency

(4x3=12)

Draw and label:

- 6.Section through the upper lid
- 7.Fundus picture in diabetic retinopathy

(2x2=4)

Answer briefly:

- 8.Spring catarrh
- 9.Keratoplasty
10. NPCB
11. Hypersensitive retinopathy
12. Scleritis

(5x2=10)

Give precise answers:

13. Mention four causes of dry eye
14. Mention two types of lasers used in ophthalmology
15. Mention four causes of retinal haemorrhage
16. Mention two absolute indications of dacryocystectomy

(4x1=4)

Q.P.Code:

Reg. no.:

Third Professional MBBS Part I Degree Examinations
(Model Question Paper)

Otorhinolaryngology

Time: 2 Hours

Total Marks: 40

- Answer all questions
- Draw diagrams wherever necessary

Essay: (10)

1.A 16 years old male, presented with progressive nasal obstruction and sudden onset,unprovoked, painless and profuse bleeding from nose, nasal examination showed apinkish smooth surfaced mass filling the nose and nasopharynx – presently as a bulgein the oral cavity and palsy of the soft palate. Answer the following :

- What is the most probable diagnosis
- Describe the clinical features of this condition
- How will you diagnose this condition
- Describe the route of spread
- How will you manage this condition

(1+2+2+2+3=10)

Short notes:

(4x3=12)

- 2.Malignant otitis externa
- 3.Retropharyngeal abscess
- 4.Complications of FESS
- 5.Atrophic rhinitis

Draw and label:

(2x2=4)

- 6.Diagram showing the structures seen through indirect laryngoscopy
- 7.Picture showing the constituents of nasal septum

Answer briefly:

(5x2=10)

- 8.Vocal nodule
- 9.Osteomeatal complex
10. MC Even's triangle
11. Grommet
12. Laryngomalacia

Give precise answers:

(4x1=4)

13. Name two major vessels in little area
- 14.Surgical treatment of choice for attico antral type of CSOM
15. Two complications of stapedectomy
16. Name two conditions where you get Hennebertz sign.

.....

Q.P.Code:

Reg. no.:

Third Professional MBBS Part II Degree Examinations
(Model Question Paper)

General Medicine – I

(CVS.CNS,GIT, Renal, Fluid & Electrolyte Balance, Genetics and Nutrition)

Time: 3 Hours

Total Marks: 60

- Answer all questions
- Draw diagrams wherever necessary

Essays:

(2x10=20)

1. 52 years old male was admitted to the casualty with one hour history of central chest pain, nausea and sweating. ECG showed ST segment elevation in leads II, III and AVF. Answer the following:

_ What is your diagnosis. _ What are the complications

_ Discuss the management. _ What are the life threatening causes for acute chest pain

(1+3+4+3=10)

2. 45 years old male with polyuria and polydypsia came with fasting and post prandial sugar reports of 140 and 240 mg/dl, respectively. Answer the following:

_ What is your diagnosis _ Describe the diagnostic criteria for this condition

_ What dietary and exercise advice you will give him _ Discuss the management

(1+2+3+4=10)

Short Notes.

(2x20=40)

3. Management of Guillian-Barre syndrome (GBS)

4. Amoebic liver abscess

5. Management of status epilepticus

6. Non alcoholic fatty liver disease

7. Bell's palsy.

8. The cardiac conduction system.

9. Clinical assessment of cerebellar function

10. Thrombolysis in stroke

11. Symptoms of Crohn's disease

12. Treatment of acute bacterial meningitis

13. Management of hyperkalemia

14. Pharmacotherapy of H. pylori infection

15. Osteoporosis

16. Insulin analogues

17. Clinical features of Cushing's syndrome

18. Wilson's disease

19. Hyperparathyroidism

20. Treatment of hepatic encephalopathy

21. Enumerate the causes for massive splenomegaly

22. Graves' ophthalmopathy

Q.P.Code:

Reg. no.:

Third Professional MBBS Part II Degree Examinations
(Model Question Paper)

General Medicine - II

(General Medicine Including Dermatology, Psychiatry and Radio Diagnosis)

Time: 3 Hours Total Marks: 60

- Answer all questions
- Draw diagrams wherever necessary

Essays:

(2x10=20)

1. 28 years old male found in a drowsy state, was brought to casualty. On examination, pulse was 48 per minute, blood pressure 112/68 mm of Hg, respiratory rate 28/ minute, pin-pointed pupils, wide spread fasciculations, and bilateral rales on chest auscultation. Answer the following

_ What is your diagnosis _ Discuss the patho-physiology of this condition _ What are the complications that may occur _ Discuss the management **(1+2+3+4=10)**

2. 32 years old multi-para came to out patient department with exertional breathlessness and fatigability. She had been experiencing marked craving for 'raw rice'. On examination, had pallor and spoon-shaped nails. Answer the following:

_ What is the most likely diagnosis _ What is the patho-physiology of this disease
_ How will you investigate this lady _ Discuss the management **(1+2+3+4=10)**

Short Notes.

(2x20=40)

3. Management of bronchial asthma.
4. Toxic epidermal necrolysis (TEN)
5. Prophylaxis of venous thrombosis
6. The WHO analgesic ladder
7. Methicillin resistant staph. aureus (MRSA)
8. Peripheral smear and bone marrow in megaloblastic anemia
9. Complications of leptospirosis
10. Treatment of cerebral malaria
11. Peritoneal dialysis
12. Reactive arthritis
13. Chest X-ray in cardiac failure.
14. Drug treatment of depression
15. Aminoglycosides
16. Initiation of anti retroviral therapy.
17. CSF findings in tuberculous meningitis
18. Clinical features and management of Russell's viper bite
19. Anaphylaxis
20. DOTS therapy for tuberculosis
21. Enteral tube feeding.
22. Dengue fever.

Third Professional MBBS Part II Degree Examinations
(Model Question Paper)
General Surgery - I

Time: 3 Hours

Total Marks: 60

- Answer all questions
 - Draw diagrams wherever necessary
 - Write **Section A** and **Section B** in separate answer books(32 Pages). Do not mix up questions from **Section A** and **Section B**
- QP Code: **Section A – Surgery GIT Marks:30**

Structured Essay: (5)

1. A 60 years old male attends the surgery outpatient department with complaints of loss of appetite, loss of weight, and early satiety of two months duration. Answer the following:

_ What is the most probable diagnosis. _ b. What are the investigations done to diagnose this disease. _ What are the investigations done to stage the disease.

_ What is the role of surgery in treating this patient.

(1+1+1+2=5)

Short essays:

(2x6=12)

2. Cholelithiasis.
3. Dynamic Intestinal obstruction

Clinical Situation (3)

4. A 32 years old male is brought to the casualty with c/o severe epigastric pain radiating to the back, along with vomiting, following a bout of alcoholism. Discuss briefly the management of this clinical condition.

Short Notes.

(5x2=10)

5. Acute appendicitis.
6. Volvulus Sigmoid.
7. Haemorrhoids.
8. Colostomy.
9. Mesenteric cyst.

QP Code: **Section B – Orthopaedics Marks:30**

Essay: (6)

1. A 70 years old female attends the orthopaedics casualty with history of fall and complains of pain right hip, inability to walk and inability to bear weight since 2 days duration. Answer the following: _ What is the most probable diagnosis _ What is the position of the lower limb in this case _ What are the investigations to be done _ What happens to Shenton's line _ What is the immediate management _ Describe the surgical management for this patient

Short essays:

(4x3=12)

2. Spina ventosa
3. compound palmar ganglion
4. GCT
5. Fibrous dysplasia

Short Notes.**(6x2=12)**

6. Ulnar paradox
7. March fracture
8. Tinel's sign
9. Holstein Lewis syndrome
10. Carpel tunnel syndrome
11. Sprain ankle

Third Professional MBBS Part II Degree Examinations
(Model Question Paper)
General Surgery - II

Time: 3 Hours**Total Marks: 60**

- Answer all questions
- Draw diagrams wherever necessary

Structured Essay: (15)

1. A thirty five years old female attends the surgery out patient department with complaints of a swelling in the front of neck along, with palpitation, increased appetite, & loss of weight.

Answer the following:

_ Discuss the specific investigations that are helpful in the diagnosis. _ Discuss the specific treatment options available for this condition.

_ Discuss the specific complications and their treatment, following surgery for this patient.

(5+5+5=15)**Essay: (5)**

2. Discuss the types, the pathophysiology, and management of Shock.

(2x4=8)**Short essays:**

3. Flail chest.

4. Acute scrotum in a child

Short Notes.**(4x3=12)**

5. Tuberculous lymphadenitis.

6. Urolithiasis.

7. Pheochromocytoma.

8. Epidural anaesthesia.

Answer briefly**(10x2=20)**

9. Extradural haematoma.

10. FAST.

11. Cutaneous squamous cell carcinomas.

12. Acute urinary retention.

13. Incisional hernias.

14. Lymphoedema.

15. Nonsurgical treatment of varicose veins.

16. Acute limb ischaemia.

17. Conservative breast cancer surgery.

18. Submandibular sialadenitis.

.....

Model question paper

Final MBBS Part II- Theory (Pediatrics including Neonatology)

Time 2 hours

Total marks 40

1. Essay (1+2+4+2+1=10 marks)

A 3 year old boy admitted with skin bleeds and epistaxis for the last one week. No history of fever, fatigue, joint pain or swelling. No similar symptoms in the past or among family members.

- (a) What is the most probable diagnosis?
- (b) Name four important differential diagnosis
- (c) Describe, how to differentiate these from your initial diagnosis clinically and from investigations (4 points for each)
- (d)
- (e) How will you manage this child
- (f) What is the prognosis?

2. Write Short notes (4X3=12 marks)

- (a) Management of severe pneumonia as per national ARI control program
- (b) Clinical features of Kawasaki disease
- (c) Febrile convulsions – management
- (d) Investigations to diagnose nephrotic syndrome

3. Write Short notes (5X2=10 marks)

- (a) Constitutional delay in growth
- (b) Vitamin A prophylaxis program
- (c) Bivalent OPV

(d) Clinical features of marasmus

(e) Breath Holding spell

4 Write short notes on

(4X2=8 marks)

(a) Tracheo esophageal fistula

(b) Initial steps in neonatal resuscitation

(c) Management of hypoglycemia in newborn

(d) Kangaroo Mother care

Model Question paper

PAPER I - OBSTETRICS & SOCIAL OBSTETRICS

Time 2 hours

Marks 40

Section A

I. Draw and Label

2

Friedman's curve of cervical dilatation

II. Short answer Questions

1x4

1. Moulding

2. Misoprostol

3. Variable deceleration

4. Plane of least pelvic dimension

III. Short answer Questions

2x3

1. Cardiovascular changes in pregnancy

2. Asynclitism

3. Follow up of gestational trophoblastic disease

IV. Short Essays

4x2

1. How do you manage unruptured tubal pregnancy

2. Antepartum management of multiple pregnancy

Section B

I. Essay

A 25 year old primi gravida presents with bleeding per vaginum at 36 weeks gestation. On examination uterus tense and tender FHS absent. a) What is the diagnosis?

b) What is the differential diagnosis?

c) Describe the management?

d) What are the complications?

1+2+4+3

II. Short Answer Questions

1x4

1. Causes of polyhydramnios

2. Diagnosis of GDM

3. Cord prolapse

4. Bandl's Ring

III. Short Answer questions

3x2

1. External Version

2. Management of Primary Post partum haemorrhage

PAPER II - Gynaecology (Family Welfare & Demography)

Time 2 hours

Marks 40

Section A

I. Draw and Label

2

Ligamentous supports of uterus

II. Short Answer Questions

1x4

1. Haematocolpos

2. Cystocoele

3. Adenomyosis

4. LNG-IUS 199

III. Short Answer Questions

2x3

1. Emergency contraception

2. Irregular ripening

3. Bartholin's Cyst

IV. Short Essays

4x2

1. Management of postmenopausal symptoms

2. Technique of vaginal hysterectomy with pelvic floor repair

Section B

I Essay

A 19 year old unmarried girl presents with 3 months amenorrhea. O/E Obese and hirsute.

- What is the most probable diagnosis?
- What is the first step in management?
- What are the different management options?
- What are the long term consequences?

1+2+4+3

II. Short Answer questions

1x4

- Tests for tubal patency
- Diagnosis of Bacterial Vaginosis
- Danazol
- Metorrhagia

III. Short Answer Questions

3x2

- Post menopausal bleeding
- Microinvasive carcinoma

3.7 Internal assessment component

Present in clause 1.15

3.8 Details of practical/clinical practicum exams

Present in clause "content of each subject in each year."

3.9 Number of examiners needed (Internal & External) and their qualifications Appointment of examiners/Evaluators

- No person shall be appointed as an examiner in any of the subjects of the professional examination leading to and including the final Professional examination for the award of the MBBS degree unless he has taken at least five years previously, a medical post graduate degree of a recognized university or an equivalent qualification in the particular subject as per recommendations of the council on teachers eligibility qualification and has had at least five years teaching experience after acquiring P.G. qualification in the subject concerned in a recognized medical college affiliated to a

University as teaching faculty.

2. Non medical teachers engaged in the teaching of medical students as full time teachers, may be appointed examiners in their concerned subjects provided they possess requisite Doctorate qualifications and five year teaching experience of medical students after obtaining their Doctorate qualifications. 50% of the examiners (internal & external) must be with medical qualification.
3. There shall be at least four examiners for 100 students, out of whom not less than 50% must be external examiners. Out of the 2 external examiners one should be from outside the state and one from outside zone under the University. Where candidates appearing are more than 100, one additional examiner, for every additional 50 or part thereof candidates appearing, be appointed.
4. In an extra ordinary situation the University can conduct the examination with three examiners with at least one external examiner subject to ratification of the concerned pass board.
5. The internal examiner in a subject shall not accept external examinership for a college from which external examiner is appointed in his subject.
6. There should be separate set of examiners for each college, with internal examiners from the concerned college.
7. External examiners shall rotate at an interval of 2 years.
8. There shall be a Chairman of the Board of paper – setters who shall be an internal examiner and shall moderate the questions.
9. Except Head of the Department of the subject concerned in a college/institution, all other with the rank of reader or equivalent and above with requisite qualifications and experience shall be appointed internal examiners by rotation in their subjects; provided that where there are no posts of readers, then an Assistant Professor may be considered for appointment as examiner.
10. The upper age limit of a person to be appointed as an examiner is 70 years.
11. After retirement from a recognized medical college the qualified examiners can be appointed as internal examiner (provided he/she is below 70 years of age) in the college from where he has retired upto six months after the date of retirement if there is shortage of qualified examiners in the department.

3.10 Details of viva: division of marks

Present in clause 2. 10 .

4 INTERNSHIP

4.1 Eligibility for internship

Every candidate will be required after passing the final MBBS examination to undergo compulsory rotational internship to the satisfaction of the College authorities and University for a period of 12 months so as to be eligible for the award of the degree of Bachelor of Medicine and Bachelor of Surgery (MBBS) and full registration.

4.2 Details of internship

4.2.1 General

Internship is a phase of training wherein a graduate is expected to learn methods/ modalities for actual practice of medical and health care and acquire skills under supervision so that he/she may become capable of functioning independently.

4.2.2 Specific objectives

At the end of the internship training, the student shall be able to:

- a) diagnose clinically common disease conditions encountered in practice and make timely decision for referral to higher level;
- b) Use discreetly the essential drugs, infusions, blood or its substitutes and laboratory services;
- c) Manage all type of emergencies – medical, surgical, obstetric, and neonatal and paediatric, by rendering first level care;
- d) Demonstrate skills in monitoring of the National Health Programmes and schemes, oriented to provide preventive and promotive health care services to the community;
- e) Develop leadership qualities to function effectively as a leader of the health team organized to deliver the health and family welfare service in the existing socio- economic, political and cultural environment;
- f) Render services to chronically sick and disabled (both physical and mental) and to communicate effectively with patient and the community
- g) Computer knowledge, data entry in connection with admission and discharge of patients.

4.2.3 Time allocation

Time allocation to each discipline is approximate and shall be guided more specifically by the actual experience obtained. Thus a student serving in a District or Taluk hospital emergency room may well accumulate skills in Surgery, Orthopaedics, Medicine, Obstetrics and Gynaecology and Paediatrics during even a single night on duty. Responsible authorities from the Medical College shall adjust the intern's opportunities to practice skills in patient care in rough approximation of the time allocation suggested.

4.2.4 Compulsory and elective postings

Community Medicine	2 months
Medicine including 15 days of Psychiatry	2 months
Surgery including 15 days Anaesthesia	2 months

Obst./Gynae. including Family Welfare	2 months
Planning	1 month
Paediatrics	1 month
Orthopaedics including PMR	1 month
ENT	15 days
Ophthalmology	15 days
Casualty	15 days
Elective Posting (1x15 days)	15 days

Subjects for Elective posting will be as follows:

- i. Dermatology and Sexually Transmitted Diseases
- ii. Tuberculosis and Respiratory Diseases
- iii. Radio Diagnosis
- iv Forensic Medicine
- v. Blood Bank

Note: Structure internship with college assessment at the end of the internship.

Foot Note: The Principal Regulations namely, "Regulations on Graduate Medical Education, 1997" were published in Part – III, Section (4) of the Gazette of India vide Medical Council of India Notification dated 4th March, 1997 and amended vide Council notification dated 29.05.1999, 02.07.2002, 30.09.2003, 16.10.2003 & 01.03.2004.

The University shall issue a provisional MBBS pass certificate on passing the final examination.

The State Medical Council will grant provisional registration to the candidate on production of the provisional MBBS pass certificate. The provisional registration will be for a period of one year. In the event of shortage or unsatisfactory work, the period of provisional registration and the compulsory rotating internship may be suitably extended by the appropriate authorities

The intern shall be entrusted with clinical responsibilities under direct supervision of a senior medical officer. They shall not be working independently.

Interns will not issue a medical certificate or a death certificate or a medicolegal document under their signature.

In recognition of the importance of hands-on experience, full responsibility for patient care and skill acquisition, internship should be increasingly scheduled to utilize clinical facilities available in District specific experiences and skills as listed in major areas:

Provided that where an intern is posted to District/Sub Divisional Hospital for training, there shall be a committee consisting of representatives of the College/ University, the State Government and the District administration, who shall regulate the training of such trainee;

Provided further that for such trainee, a certificate of satisfactory completion of training shall be obtained from the relevant administrative authorities which shall be

countersigned by the Principal/Dean of the College.

Adjustment to enable a candidate to obtain training in elective clinical subjects may be made.

Each medical college shall establish links with one entire district extending out-reach activities. Similarly, Re-orientation of Medical Education (ROME) scheme may be suitably modified to assure teaching activities at each level of District health system which will be coordinated by Dean of the Medical College.

Out of one year, 6 months shall be devoted to learning tertiary care being rendered in teaching hospital/district hospital suitably staffed with well qualified staff, 3 months of secondary care in a small District or Taluk Hospital/ Community Health Centre and 3 months in Primary Health care out of which 2 months should be in Primary Health Centre with full attention to the implementation of National Health Programme at the community level. One month of primary care training maybe in the form of perceptorship with a practicing family physician or voluntary agency or other primary health care provider.

2.2.5. Assessment for internship

- The intern shall maintain a record of work in the form of a log book, which is to be verified and certified by the medical officer under whom he works. This shall cover all aspects including the essential skills - covering all Taxonomic Domains, Ethical skills, Communication skills and computer skills in connection with data entry regarding admissions and discharges - that would have to be learned during Internship training. An assessment and grading of these skills would be made by the concerned authorities in each department periodically. Assessment and grading of the computer skills should be made by the HODs and entered in the log book. Performance of the skills should be taught, supervised and certified by a member of the teaching staff.

Apart from scrutiny of the record of work, assessment and evaluation of training shall be undertaken by an objective approach using situation tests in knowledge, skills and attitude during and at the end of training. Based on the record of work and date of evaluation, the Dean/Principal shall issue certificate of satisfactory completion of training, following which the University shall award the MBBS degree or declare him eligible for it.

- Satisfactory completion shall be determined on the basis of the following score ranging from 0 to 5.

0 – Poor, 1 –Average, 2 –Satisfactory, 3 – Good, 4 – Very Good and 5 – Excellent i.

Proficiency of knowledge required for each case.

- ii. The Competency in skills expected to manage each case: namely
 - a. Competency for performance of self-performance
 - b. Of having assisted in procedures
 - c. Of having observed procedures.
- iii. Responsibility, punctuality, work up of case, involvement in treatment, follow-up reports iv.
- Capacity to work in a team (behaviour with colleagues, nursing staff and relationship with

paramedicals)

v. Initiative, participation in discussions, research aptitude.

A score of less than 3 any of above items will represent unsatisfactory completion of internship.

4.2.6 Rules for granting transfer during internship

- 8 As far as possible C.R.I should be done in the same college where the student has studied.
- 9 Transfer of C.R.I is not a right. But it is granted in situations where the student has difficulty in completing the C.R.I in the college of study. A maximum number of 5% of the permitted yearly admission of students of the college shall be allowed for transfer.
- 10 The Principal/ Head of the Institution will submit a Declaration to the above effect in each case of request for transfer of CRI
- 11 The posting in Community Medicine [3 months] should be done in the college of study under department of Community Medicine in all cases. Only the rest of the 9 months of the C.R.I is allowed to be transferred.
- 12 For the transfer of C.R.I from one institution to another institution, NOC of college of study and institution where C.R.I is to be completed must be obtained. The permission of Travancore Cochin Medical Council also has to be obtained before applying to KUHS.
- 13 C.R.I can be done in any of the MCI recognized Medical College or recognized non teaching hospitals in the list published by MCI from time to time.
- 14 The number of candidates doing C.R.I in one institution should not be more than the maximum number approved by MCI.
- 15 The Government decision regarding, who can do C.R.I in a Govt. Medical College is to be followed strictly. [currently Government permits only the students from Govt. Colleges alone to do C.R.I in Govt. Colleges]
- 16 For the students doing C.R.I in Medical Colleges, the certificate should be issued by the Principal / Dean of the college.
- 17 MCI regulations on Graduate Medical Education 1997 section 5vii says “provided that where an intern is posted to District / Sub-divisional Hospital for training, this should be a committee consisting of representatives of the college / University, the State Government and the District administration, who shall regulate the training of such trainee. Provided further that for such trainee a certificate of satisfactory completion of training shall be obtained from the relevant administrative authority which shall be counter signed by the Principal / Dean of the college”. In view of the above regulations, all non teaching hospitals recognized for C.R.I training should have a Regulation Committee consisting of [1] The Medical Superintendent of the concerned institutions [convener], [2] Nominee of the nearest Govt. Medical College Principal not below the rank of Professor from a clinical department, [3] District Medical Officer or Deputy DMO nominated by DMO.
- 18 In the non teaching institutions the regulating committee should verify that internship was done in each department as specified by MCI regulations.

- 19 The C.R.I certificate from non teaching institutions should be approved and signed by all the three members of the regulating committee. This certificate must be authenticated by Principal / Dean of the Medical College study of the student before submitting to the University.

4.3 Model of Internship Mark lists

Not applicable

4.4 Extension rules

Extension of internship: Internship shall be extended by the number of days the student remains absent. These extended days of internship should be completed in the respective external/internal institution.

4.5 Training given

As per clause 4.2

5. ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc.

Provided in the University website

APPRAISAL FORM

Name of the trainee : _____

Posting duration : _____ From20
To20

Number of days attended / allotted : _____

Name of Supervisor : _____

Date : _____

Type of work done : _____ Yes / No

Speech Diagnosis : _____

Speech Therapy : _____

Audiological Evaluation :
 Survey / Field work :
 Grade awarded(Circle the appropriate) : A /B /C /D /E

- | | <u>Professional and Technical Skills</u> | <u>Excellent Good</u> | <u>Average Poor</u> |
|----|--|-----------------------|---------------------|
| 1. | Interest shown by the student in planning, organizing and implementing therapeutic goals and activities. | | |
| 2. | Efficiency in providing a clear and relevant information and feedback to the client and supervisors. | | |
| 3. | Involvement in case presentations and clinical. | | |
| 4. | Interaction with the patient. | | |
| | <u>Assessment and Reporting</u> | | |
| 5. | Efficiency in suing formal and informal tests appropriate analysis, interpretation, counselling and recommendations. | | |
| 6. | Submission of lesson plans and therapy reports on time. | | |
| | <u>Personal Quality</u> | | |
| 7. | Punctual | | |
| 8. | Inform to the supervisors regarding any change in their schedule | | |
| 9. | Discipline | | |

Remarks if any:

Signature with seal

Office seal

5.2 Any details which are not mentioned in the above will be decided by the KUHS after considering the KUHS Act and Statutes, Governing Council decisions, Guidelines of the respective Councils, the

Government and directives of the Hon'ble Courts.

APPENDIX E

TIME SCHEDULE FOR COMPLETION OF THE ADMISSION PROCESS FOR FIRST MBBS COURSE

Schedule for Admission	Seats filled up by Central Government through all India Entrance	Seats filled up by the State Govts/Instt.
Conduct of Entrance Examination	Month of May	Month of May
Declaration of Result of Qualifying Exam./Entrance	By 5th June	By 15th June
1st round of counselling/admission	To be over by 30th June	To be over by 25th July
Last date for joining the allotted college and course	Within 15 days from the date of allotment of seats	31st July
2nd round of counselling for allotment of seats from waiting list	To be over by 8th August	Upto 28th August
Last date for joining for candidates allotted seats in 2nd round of counselling from the waiting list	Within 15 days from the date of allotment of seats. (seats vacant after 22nd August will be surrendered back to the States / Colleges)	
Commencement of academic	1st of August	
Last date upto which students can be admitted against vacancies arising due to any reason	30th September	

Note: @ Head of the College should intimate the vacancies existing after the last date of joining the course by the candidate concerned in respect of the All India Quota of seats to the DGHS within seven days and latest by 23rd of July.