MEDICINE

MBBS DEGREE COURSE
&
CURRICULUM

PHASE – II SUBJECTS

Sri Siddhartha
Academy of Higher Education
Deemed-to-be-University
Accredited 'A' Grade by NAAC

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SECTION –I

OBJECTIVES OF MEDICAL GRADUATE TRAINING PROGRAMME (MCI Regulations 1997)

The MCI has stated the goals and general objectives of graduate medical education in the new regulations. They are given in this section. It is desired that in consonance with these national goals, each medical college should evolve institutional objectives.

1) NATIONAL GOALS:

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

a) Recognise ' health for all' as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realisation of this goal;
b) Learn every aspect of National policies on health and devote himself/ herself to its practical implementations;
c) Achieve competence in practice of holistic medicine, encompassing preventive, curative and rehabilitative aspects 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 response national aspirations.

2) INSTITUTIONAL GOALS:

The undergraduate students coming out of a medical institution should:

a) Be competent in diagnosis and management of common health problems of individual and the community, commensurate with his/ her position as member of the health team at the primary, secondary or tertiary levels, using his/her clinical skill 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 for different therapeutic modalities, be familiar with the administration of the "essential drugs" and their common side effects;
d) Be able to appreciate the social-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the 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; Be familiar with the basic factors, which are essential for the implementation of the National Health Programes.
    i. Family welfare and Maternal and Child Health (MCH),
    ii. Sanitation and water supply,

iii. Prevention and control of communicable and non-communicable diseases,
iv. Immunisation,
v. Health Education;

f) Acquire basic management skill in the area of human resources, materials and resources management related to health care delivery;
g) Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating out come of such measures;
h) Be able to work as a leading partner in health care teams and acquire proficiency in communication skills;
i) Be competent to work in a variety of health care settings;
j) Have professional characteristics and attitude required for professional life such as personal integrity, sense of responsibilities and dependability and ability to relate to or show concern for other individuals ;
k) All efforts must be made to equip the medical graduate to acquire the detailed in Appendix B of Medical Council of India Regulations on Medical Education, 1997.
l) Be able to observe medical ethics and to discharge medico legal responsibilities.

3. COURSE OF STUDY

Every student shall undergo a period of certified study extending over 4 ½ years academic years from the date of commencement of his or her study for the subject comprising the medical curriculum to the date of completion of the examination followed by one year compulsory rotating internship. The 4 ½ year course has been divided into three phases, Phase I- 1year, consisting of two terms of 6 months each. Phase II – 1 ½ years consisting of 3 terms of 6months each and Phase III – 2 years consisting of 3 terms of 6 months each.

The subjects of Phase II are Pharmacology, Pathology, Microbiology, Fornesic Medicine, and Community Medicine. There shall be university examination at the end of Vth term in all these subjects except Community Medicine.

4. ATTENDANCE

Every candidate should have minimum of 75% attendance of the total classes conducted in theory and practical separately, calculated from the date of commencement of the term to the last working day as notified by the

university in each of the subjects prescribed to be eligible to appear for the examination.

The principal should notify at the college the attendance details at the end of each term without fail under intimation to this university.

A candidate lacking in the prescribed attendance and progress in any one subject in theory and practical in the first appearance should not be permitted to appear in that subject.

Shortage of attendance of the students must be informed to the parents or guardian.

5. TEACHING HOURS

Teaching hours for theory and practical classes for the Phase – II subjects.

Subject	Theory	Practicals	Integrated teaching	Total hours
Pathology	120 hrs	144 hrs	36 hrs	300 hrs
Pharmacology	120 hrs	144 hrs	36 hrs	300 hrs
Microbiology	120 hrs	95 hrs	36 hrs	250 hrs
Forensic Medicine	70 hrs	20 hrs	10 hrs	100 hrs
Community Medicine	100 hrs	80 hrs	20 hrs	200 hrs

SECTION – II

SCHEME OF THE EXAMINAION

1. INTERNAL ASSESSMENT

It shall be based on evaluation of assignment, preparation of seminar, participating in group discussion. Regular periodic examination should be conducted through out the course. There should be a minimum of at lest three sessional examinations during phase II of the course. The final internal assessment examination should be like that of the university examination. Average of **All The Examinations Marks** should be considered while calculating the marks for the internal assessment. Day to day records should be given importance in the internal assessment. The weightage given to internal assessment is 20% out of total marks assigned to the subject.

A student must secure at least 35% of total marks fixed for internal assessment in a particular subject in order to be eligible to appear in the university examination of that subject (Vide Medical Council of India Notification on Graduate Medical Education (Amendment) Regulations 2003, published in the Gazette of India part 3, Section 4, Extraordinary issued on 15th Oct 2003).

Assistant professor and above with 5 years Post MD teaching experience can conduct internal assessment examination. Paper record of the work should be maintained which will be the basis of all student internal assessment and should be available for scrutiny. The Internal Assessment marks of both Theory and Practical obtained by the candidates should be sent to the university at least 15 days prior to the commencement of theory examination.

2. ELIGIBILITY FOR EXAMINATION

- Shall have under gone the approved course of study in the subject in prescribed duration.
- Shall have attended 75% of total classes in theory and practice's separately.
- Shall secure 35% of total marks fixed for I A in a particular subject.

3. DECLARATION OF CLASS

- A candidate having appeared in all subjects in the same examination and passed that examination in the first attempt and secures 75% of marks or more of grand total marks prescribed will be declared to have passed the examination with **Distinction.**
- A candidate having appeared in all subjects in the same examination and passed that examination in the first attempt and secures 65% of marks or more but less than 75% of grand total marks prescribed will be declared to have passed the examination in **First Class.**
- A candidate having appeared in all subjects in the same examination and passed that examination in the first attempt and secure 50% of marks or more but less than 65% of grand total marks prescribed will be declared to have passed the examination in **Second Class**.
- A candidate passing the university examination in more than one attempt shall be placed in **Pass Class** irrespective of the percentage of marks secured by him / her in the examination.

4. UNIVERSITY EXAMINATIONS – SUBJECTS AND MARKS

The distribution of marks for theory and practical examinations for various subjects of Phase – II as shown below ;

Subject wise distribution of Marks for University examinations.

A. THEORY

	Pathology	**Microbiology**	**Pharmacology**	**Forensic Medicine**
1. Written Paper : No. of papers & Maximum marks for each paper	Two 2 x 100 = 200	Two 2 x 100 = 200	Two 2 x 100 = 200	One 100
2. Viva-voce (Oral Examination)	40	40	40	20
3. Internal Assessment (Theory)	60	60	60	30
Total Theory	**300**	**300**	**300**	**150**

B. PRACTICAL

1. Practical :	80	80	80	40
2. Internal Assessment (Practical)	Practicals - 15 + Record -05 20	Practicals -15 + Record -05 20	Practicals -15 + Record -05 20	Practical + Record 10
Total Practical	**100**	**100**	**100**	**50**
Grand Total	**400**	**400**	**400**	**200**

**** Note :*** ***The examination for Community Medicine will be held in Phase –III along with Part-I subjects.***

5. CRITERIA FOR PASS

For declaration of pass in any subject in the university examination, a candidate shall pass both in theory and practical / clinical examinations separately as stipulated below ;

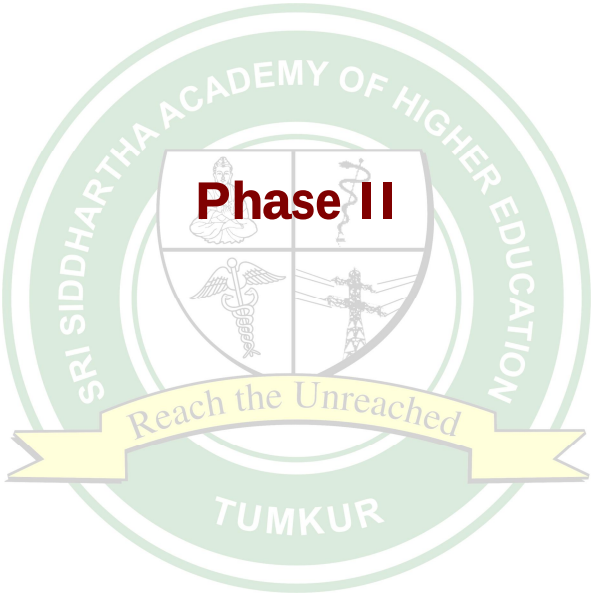
The theory component consists of marks obtained in university written paper(s) viva-voce examination and internal assessment (theory). For a pass in theory, a candidate shall secure not less than 50% marks in aggregate i.e., marks obtained in written examinations, viva-voce examinations and internal assessment (theory) added together.

For a pass in practical / clinical examination, a candidate shall secure not less than 50% marks in aggregate i.e., marks obtained in university practical / clinical examination and internal assessment (practical) added together.

A candidate not securing 50% marks in aggregate in theory or practical / clinical examination in a subject shall be declared to have failed in that subject and is required to appear for both theory and practical / clinical again in the subsequent examination in that subject.

SECTION - III

Course of Study, Scheme of Examination



Phase II

PATHOLOGY

The Syllabus for the 2nd Professional MBBS Course in Pathology is based on the Curriculum prescribed by the Medical Council of India.

A) GOALS :

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

B) OBJECTIVES :

a) Knowledge :

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

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

b) Skills :

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

- Describe the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results

- Perform the simple bed-side tests on blood, urine and other biological fluid samples;
- Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders;
- Understand biochemical/physiological disturbances that occur as a result of disease in collaboration with pre clinical departments.

c) Integration

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

GENERAL PATHOLOGY

Introduction

- ✓ Introduction and Scope of Pathology.
- ✓ Brief resume of historical aspects, Present state of the art and future.
- ✓ Ethical aspects of pathology practice.

CELL INJURY AND CELLULAR ADAPTATION:

Must know

- Cell injury - Aetiopathogenesis with a brief recall of normal cell structure.
- Reversible cell injury – Types, Sequential changes, Cellular swellings, Hyaline changes, Mucoid changes.
- Irreversible cell injury: Necrosis, Gangrene & Apoptosis.
- Pathologic calcification: Dystrophic and Metastatic.
- Intracellular Accumulations: Fatty changes, Protein accumulations, Glycogen accumulations.
- Extra cellular accumulations: Amyloidosis – classification, pathogenesis, pathology including special stains.
- Atrophy, Hypertrophy.
- Hyperplasia, Metaplasia.

Desirable to know

- Pigment Disorders:
    - Exogenous.
    - Endogenous: Lipofuschin, Haemosiderin, Melanin.
- Ochronosis, Porphyria.

INFLAMMATION AND REPAIR:

Must know

- Inflammation: Definition & Types.
    - Acute Inflammation: Components, Triggering stimuli, Vascular and Cellular events, Morphologic patterns & outcome.
    - Chemical Mediators of Inflammation.
    - Inflammatory cells.
    - Chronic inflammation: Causes, Morphological features, Nonspecific and Granulomatous with examples.
- Repair, wound healing by primary and secondary union.
- Local & Systemic Factors influencing healing.
- Healing in specific site including bone healing.

IMMUNOPATHOLOGY:

Must know

- Immune system: General concepts; organization, cells, antibodies and regulation of immune responses.
- Hypersensitivity: type and examples, antibody and cell mediated tissue injury with examples.
- Primary & Secondary immunodeficiency.
- Auto-immune disorders: Basic concepts and Classification, SLE.
- AIDS –Aetiology, Modes of transmission, Pathogenesis, Pathology, Opportunistic infections, Clinical features & Diagnostic procedures.

Desirable to know

- Autoimmune disease: organ specific and non-organ specific such as polyarteritis nodosa, Hashimoto's disease. Sjogren's, Polymyositis, Dermatomyositis, Scleroderma.
- Organ transplantation: Immunologic basis of rejection and graft versus host reaction, Tumor immunity.

INFECTIOUS DISEASES:

Must know

- Mycobacterial infections: Tuberculosis, Leprosy
- Bacterial infections: Pyogenic, Typhoid, Diphtheria, Gram negative infection, Syphilis, Bacillary dysentery.
- Viral infections: Poliomyelitis, Herpes, Rabies, Measles, Influenza, Chikungunya.
- Rickettsial, Chlamydia.
- Fungal infections.
- Parasitic infections: Malaria, Filaria, Amoebiasis, Cysticerocosis, Hydatid cyst.

CIRCULATORY DISTURBANCES:

Must know

- Hyperemia, Ischemia and Haemorrhage.
- Congestion: Definition, Types and Pathology (CVC - Lung, Liver & Spleen).
- Edema: Definition, Aetiopathogenesis, types and clinical features.
- Thrombosis: Definition, Aetiopathogenesis, Pathology and fate.
- Embolism: Definition, Types, Pathogenesis and clinical features.
- Infarction: Definition, Aetiopathogenesis, Pathology and laboratory diagnosis.
- Shock: Definition, Aetiopathogenesis, Pathology and clinical features.

NEOPLASIA:

Must know

- Precancerous lesions
- Neoplasia: Definition, Nomenclature, Classification, Biological behaviour, Differences between Benign and Malignant neoplasms, Cancer suppressor genes.
- Malignant Neoplasia: Carcinoma and Sarcoma, Grades and Stages, Metastasis.
- Carcinogenesis: Physical, Chemical & Microbial
- Hereditary and Cellular oncogenes.
- Benign & malignant epithelial tumors Eg.: Squamous Papilloma, Squamous cells carcinoma, Adenocarcinoma, Malignant melanoma.
- Benign & malignant mesenchymal tumors Eg: Fibroma, Lipoma, Neurilemmoma, Fibrosarcoma, Liposarcoma.
- Mixed Tumors – Teratoma.
- Laboratory Diagnostic Methods – Biopsy, Exfoliative Cytology, FNAC, Frozen section, Tumor markers, Immunohistochemistry, Flow cytometry and PCR (Basic Concepts).

Desirable to know

- Tumor and host interactions: Systemic effects including Paraneoplastic syndromes, Cachexia Tumor immunology.

NUTRITIONAL & OTHER DISORDERS:

Must know

- Protein energy malnutrition: Marasmus, and Kwashiorkor.
- Vitamin deficiency disorders:
    - Rickets and Osteomalacia.
    - Vitamin A deficiency.
    - Vitamin B complex deficiencies.
    - Vitamin C deficiency.

Desirable to know

- Environmental Pathology

GENETIC DISORDERS:

Must know

- Basic concepts of genetic disorders with examples.,
- Laboratory diagnosis of genetic disorders.
- Specific diseases:
    - Down's syndrome.
    - Turner's syndrome.
    - Klinefelter's syndrome.

Desirable to know

- Storage disorders: Gaucher's & Niemann-Pick's disease.

SYSTEMIC PATHOLOGY

HAEMATOLOGY:

Must know

- Constituents of blood and bone marrow & hematopoiesis.
- Anemia: Classification, causes, clinical features & laboratory diagnosis.
- Nutritional anemias: Iron deficiency anemia, Folic acid, Vit. B12 deficiency anemia including pernicious anemia.
- Hemolytic anemias: Classification and Laboratory Investigations.
- Hereditary hemolytic anemias: Thalassemia, Sickle cell anemia, Spherocytosis and Enzyme deficiencies.

Acquired hemolytic anemias

i. Alloimmune, Autoimmune

ii. Drug induced, Microangiopathic

Pancytopenia: Aplastic anemia.

Hemostatic disorders :

Vascular and Platelet disorders with their laboratory diagnosis.

Coagulation factor deficiency: Haemophilia, Von-Willibrands disease, DIC.

Leukocytic disorders :

Leukocytosis, leukopenias, Leukemoid reaction.

Leukemia : Classification, clinical manifestation, pathology and laboratory diagnosis.

Multiple myeloma.

Desirable to know

Myelodysplastic syndrome – Basic concepts.

Myeloprolifertative disorders : polycythemia, myelofibrosis – basic concepts.

Dysproteinemias.

CARDIOVASCULAR PATHOLOGY :

Must know

- Congenital Heart disease : Atrial septal defect, Ventricular septal defect, Fallot's tetralogy, Patent ductus arteriosus.
- Bacterial Endocarditis: Aetiolopathogenesis, morphological, clinical features & complications.
- Rheumatic Heart disease: Aetiopathogenesis, morphological, clinical features & complications.
- Ischemic heart disease: Myocardical infarction – Aetiopathogenesis, pathology, complications & laboratory investigations.
- Hypertension: Classification, causes of secondary hypertension and vascular changes in hypertension.

Vascular diseases:

- Atherosclerosis: Aetiopathogenesis, pathology & complications.
- Monckeberg's medial calcification.
- Aneurysm: Classsification, aetiology, pathogenesis, morphological and clinical features.

Desirable to know

- Cardiomyopathy – basic concepts
- Tumors of Heart
- Arteritis
- Tumors of blood vessels.

RESPIRATORY SYSTEM :

Must know

Chronic obstructive lung diseases :

- Bronchial Asthma – Aetiopathogenesis, pathology, clinical features & laboratory diagnosis.
- Emphysema – Definition, Classification, pathology & complications.
- Chronic bronchitis – Aetiopathogenesis, pathology & clinical features.
- Bronchiectasis - Definition, Aetiopathogenesis, pathology & clinical features.
- Pneumonias – Definition, classification, Aetiopathogenesis, pathology, clinical features & laboratory diagnosis.
- Lung abscess – Aetiopathogenesis & morphology.
- Pulmonary tuberculosis: primary & secondary, morphologic types including pleuritis.
- Tumors of the lung & pleura – Classification, Aetiopathogenesis, pathology, clinical features & laboratory diagnosis.

Desirable to know

- Fungal & viral lesions of the lung.
- Occupational lung disorders - Pneumoconiosis
- Atelectasis, Hyaline membrane disease, ARDS.

RENAL SYSTEM :

Must know

- Renal failure: Types, aetiology & clinical features.
- Glomerular diseases (Nephritic & Nephrotic syndrome) – Definition, Aetiopathogenesis, pathology, clinical features & laboratory diagnosis.

- Tubulo interstitial diseases:
- Acute tubular necrosis – Pathogenesis, pathology & clinical course.
- Pyelonephritis – Definition, Aetiopathogenesis, pathology, clinical features & laboratory diagnosis.
- Kidney changes in hypertension & diabetes.
- Urolithiasis - Aetiopathogenesis, Types, pathology & clinical features.
- Cystitis – Aetiology, morphology & clinical features.
- Tumors :
- Renal cell carcinoma - Epidemiology, pathology, clinical features & prognosis.
- Nephroblastoma - Pathogenesis, pathology & clinical features.
- Transitional cell carcinoma – Aetiology, morphology & clinical features.

Desirable to know

Renal malformations : Polycystic kidney disease, types and clinical features.

Obstructive Uropathy.

Hydronephrosis.

GASTROINTESTINAL TRACT :

Must know

Oral cavity lesions:

Candidiasis

Leukoplakia & Carcinoma: Risk factors, pathology & clinical features.

Salivary gland lesions:

Sialadenitis.

Tumors: Pleomorphic adenoma, Warthins tumor - pathology & clinical features.

Oesophagus lesions:

Oesophagitis - Aetiopathogenesis & pathology.

Barret's oesophagus.

Carcinoma - Aetiopathogenesis, pathology & clinical features.

Stomach lesions:

Gastritis (Acute, Chronic) - Aetiopathogenesis, pathology & clinical features.

Peptic Ulcer - Aetiopathogenesis, pathology, clinical features & complications.

Tumors - Classification.

Carcinoma - Aetiopathogenesis, pathology, clinical features & prognosis.

Intestine lesions:

Inflammatory lesions of small intestine (Typhoid, Tuberculosis, Crohn's and Malabsorption syndromes) - Aetiopathogenesis, pathology & clinical features.

Inflammatory lesions of large intestine (Amoebic colitis, Ulcerative colitis, Appendicitis) - Aetiopathogenesis, pathology & clinical features.

Tumors and tumour like condition of the small and large intestine:

Polyps – Types, pathology & clinical features.

Carcinoid – Incidence, sites, pathology & clinical features.

Aster-Coller classification of Colo-rectal carcinoma.

Carcinoma & Lymphoma – Aetiopathogenesis, Pathology & clinical features.

Pancreas lesions:

Pancreatitis (Acute & Chronic) - Aetiopathogenesis, Pathology & clinical features.

Desirable to know

Apudomas, Intussusception

Mesenteric thrombosis, Enterocolitis, Diverticulosis & Hirschsprung diseases.

Tumors of pancreas (exocrine & endocrine).

HEPATO-BILIARY SYSTEM :

Must know

Jaundice: Classification, causes, clinical features & laboratory diagnosis.

Hepatitis: Acute, Chronic, Aetiopathogenesis, pathology & laboratory diagnosis.

Alcoholic liver disease: Pathogenesis and morphology.

Cirrhosis : Definition, classification, aetiopathogenesis, pathology & complications.

Liver abscesses (Pyogenic, parasitic & Amoebic) – pathology & clinical features.

Hepatocellular carcinoma – Aetiopathogenesis, pathology & clinical features.

Gall bladder lesions :

Cholecystitis (Acute & Chronic) - pathology & clinical features.

Cholelithiasis – Types, Aetiopathogenesis & clinical features.

Desirable to know

Carcinoma – Gall bladder.

Biliary cirrhosis.Indian childhood cirrhosis

Hemochromatosis.

LYMPTHORETICULAR SYSTEM & SPLEEN :

Must know

Lymphadenitis – Non specific (Acute & Chronic).

Causes of Lymphadenopathy.

Primary Tumors:

Hodgkin's & Non Hodgkin's Lymphomas – Classification, clinical features & pathology.

Splenomegaly – Causes & effects.

Desirable to know

Thymus : Thymoma

FEMALE GENITAL SYSTEM :

Must know

Causes, routes of infection, methods of diagnosis of sexually transmitted infections – Gonorrhea, Herpes simplex, Human Papilloma virus, Trichomonas vaginalis, candidiasis.

Vulva lesions :

Bartholin's cyst, Condyloma accuminatum.

Cervix lesions :

Cervicitis, Cervical Intraepithelial Neoplasia (CIN).

Cervical carcinoma – Aetiopathogenesis, pathology & laboratory diagnosis.

Uterus :

Endometrial hyperplasia, Endometriosis, Adenomyosis.

Tumors – Leiomyoma – Sites, pathology & clinical features.

Endometrial Carcinoma - Aetiopathogenesis, pathology & clinical features.

Trophoblastic disease :

Hydatidiform mole, choriocarcinoma.

Ovarian tumors: Classification, pathology & clinical features.

Fallopian tube: Salphingitis.

Desirable to know

Basic pathology of infertility.

Fallopian tube: Tumors.

MALE GENITAL SYSTEM :

Must know

Penis :

Inflammatory & Premalignant lesions.

Carcinoma – Aetiopathogenesis & pathology.

Testes :

Orchitis – Causes & pathology.

Tumors – Classification & pathology.

Prostate :

Benign Nodular hyperplasia

Carcinoma - Aetiology, pathology, clinical features & laboratory diagnosis.

Desirable to know

Basic investigations in male infertility.

Prostatic Intraepithelial Neoplasia (PIN).

BREAST :

Must to Know

Aetiopathogenesis of lump in the breast.

Fibrocystic disease.

Benign tumors: Fibroadenoma, Phylloides tumor.

Carcinoma – Types, Aetiopathogenesis, pathology & clinical features.

Desirable to know

Intraductal Papilloma.

Gynaecomastia.

MUSCULOSKELETAL SYSTEM :

Must know

Osteomyelitis (Acute, Chronic, TB) - Aetiopathogenesis, pathology & clinical features.

Classification of Bone Tumors.

Osteosarcoma, Ewing's sarcoma, Giant cell tumor – Pathology & clinical features.

Desirable to know

Arthritis: Suppurative, Rheumatoid, Osteoarthritis, Gout.

Metabolic bone diseases: Osteoporosis, Osteopetrosis, Paget's disease.

Osteochondroma, Chondrosarcoma, Synovial sarcoma - Pathology & clinical features.

Diseases of skeletal muscle: Duchenne muscular dystrophy, Inflammatory myopathies.

Tumors of skeletal muscle: Rhabdomyosarcoma.

ENDOCRINE PATHOLOGY :

Must know

Diabetes Mellitus: Types, Pathogenesis, Pathology & laboratory diagnosis.

Thyroid :

Goiter – Types, aetiopathogenesis, pathology & clinical features.

Thyroiditis - Types, aetiopathogenesis, pathology & clinical features.

Hypothyroidism - Aetiopathogenesis, pathology, clinical features & laboratory diagnosis.

Hyperthyroidism - Aetiopathogenesis, pathology, clinical features & laboratory diagnosis.

Tumour: Papillary carcinoma.

Adrenal :

Cushing's syndrome, Addisons's disease, Pheochromocytoma.

Desirable to know

Thyroid tumors - Adenoma, Carcinomas (follicular, medullary, anaplastic).

Hyperparathyroidism – Types, aetiopathogenesis & clinical features.

Hypoparathyroidism –Aetiopathogenesis & clinical features.

Hyper & Hypo-pituitarism - Aetiopathogenesis & clinical features.

Pituitary Adenoma.

NEUROPATHOLOGY :

Must know

Acute Meningitis: Viral, Bacterial.

Chronic meningo-encephalitis: Tuberculosis, Neurosyphilis.

Brain Abscess.

HIV & Cysticercosis.

CNS Tumours: Astrocytoma, Neuroblastoma, Meningioma.

PNS Tumors: Schwannoma, Neurofibroma.

Desirable to know

Syringomyelia.

Alzheimer's disease, Parkinsonism.

Medulloblastoma.

DERMATO PATHOLOGY :

Must know

Naevus.

Actinic Keratosis & other premalignant lesions.

Skin tumours: Squamous cell carcinoma, Basal cell carcinoma, Melanoma.

Desirable to know

Seborrheic Keratoses.

Psoriasis, Seborrheic dermatitis, Lichen planus.

Bullous diseases.

Molluscum contagiosum.

Leprosy.

Superficial fungal infections.

Scabies.

OCULAR PATHOLOGY :

Must know

Retinoblastoma.

Desirable to know

Pinguecula & Pterygium.

Keratitis & Corneal Ulcers.

Endophthalmitis, Panophthalmitis & Phthisis bulbi.

BIO-MEDICAL WASTE :

Types, potential risks and their safe management.

CLINICAL PATHOLOGY INCLUDING CLINICAL HAEMATOLOGY .

1. Sample collection of various haematological and clinical pathological investigation, Anti coagulants.
2. Theroretical aspects of HB-estimation, blood indices, ESR, L.E., Cell, Reticulo cyte, normal values in haematology.
3. Study of Bone marrow.

4. Blood grouping : Concept of Blood group, selection of donor, major and minor cross matching, Blood transfusion, reaction, diseases transmitted by blood transfusion and Comb's Test.
5. CSF Analysis.
6. Semen Analysis.
7. Exfoliative cytology, FNAC and FNAB.
8. Body fluids, Pleural, Peritoneal, Synovial, Pericardial fluids.
9. Liver function test, Renal function test and Thyroid function test.

PRACTICALS : 144 hrs.

The students of pathology are to be trained in practical laboratory work including the basics in clinical pathology, haematology and histopathology including morbid anatomy.

1. The students should be conversant with the organization and functioning of the laboratories and should be aware of the safety precautions to be taken in the laboratories.
2. The students should be conversant with the use of compound microscope.
3. They should be conversant and be able to perform and interpret the routine laboratory investigations.
4. The students should be aware of the common methods of collection of samples for haematological and bio-chemical investigations and anticoagulationts to be used. They should be conversant with the methods of collection of body fluids and for cytological examinations and the preservatives to be used.
5. The clinico-pathological exercises include the physical and chemical examinations of urine including the microscopy and the application of the tests in diagnosis of diseases.
6. The haematology exercises include the Haemoglobin estimation, E.S.R. peripheral smears study, P.C.V. and cell counts (R.B.C., W.B.C., Eosinophil), and haematological indices, total and differential count, Reticulocyte count, blood grouping, techniques and interpretation of bone marrow preparations to be demonstrated.

7. The students should also be conversant with the method of collection and transportation of biopsy specimens to the laboratory including the preservatives used. They should have the knowledge of method of processing of samples and common histological techniques including H & E stain and a few special stains like PAS, Verhoff stains, Perl's Prussian stain, MTS and Papanicolaou etc.,
8. The students should also have the knowledge of application of frozen section.
9. The students should be able to identify as spotters the common histopathological, haematological and cytological slides and specimens and charts and their interpretations.
10. The students should be able to correlate the history and identify the common histopathological and haematological slides and specimens and discuss the relevant diagnosis.
11. The students should have the knowledge of rapid diagnostic methods and principle and use of Auto Analyzers.
12. The students should maintain the practical record book and keep it up-to-date and submit of time for valuation.

Practical classes – 80 Classes

Each practical class will be of 2 hours duration. The procedures to be demonstrated and practiced are:-

1. Introduction to the Department & branches of Pathology:
2. Study of microscope.
3. Blood grouping – ABO & Rh.
4. Hemoglobin estimation by Drabkin's / acid hematin method.
5. Peripheral smear staining and study.
6. Study of peripheral smears of anemia – Microcytic hypochromic anemia, Dimorphic anemia, Thalassaemia , Sickle cell anemia.
7. Study of peripheral smears of leukaemia - AML, ALL, CML, CLL
8. Study of bone marrow smears – Megaloblastic marrow, Multiple myeloma
9. Urine analysis – Physical, chemical and microscopic examination

INSTRUMENTS DEMONSTRATION :

Lumbar puncture needle
Liver biopsy needle
Bone marrow aspiration needle
Wintrobe's tube
Westergren's E.S.R tube and stand
Neubauer's counting chamber
R.B. C pipette
W.B.C pipette
Haemoglobin pipette
Sahli's haemoglobinometer
Albuminometer
Urniometer

HISTOPATHOLOGY SLIDES AND SPECIMEN :

1. Acute Appendicitis
2. Lobar Pneumonia
3. T.B. Lung
4. T.B. Lymphnode
5. Sequestrum
6. Fatty Liver
7. C.V.C Liver
8. Lipoma
9. Squamous Cell Carcinoma Foot
10. Malignant Melanoma
11. Cavernous Haemangioma Liver
12. Chondroma
13. Madura Mycosis
14. Gastric Ulcer
15. Adenocarcinoma Colon
16. T.B. Intestine
17. Polyp-Intestine
18. Typhoid Ulcer – Intestine
19. Intusseception
20. Amoebic Ulcer – Intestine
21. Gall Stones
22. Portal Cirrhosis
23. Bronchiectasis
24. Emphysema
25. Secondaries Lung
26. Bronchogenic Carcinoma
27. Rheumatic Endocarditis
28. Rheumatic Pericarditis
29. Mitral & Aortic Stenosis
30. Atheroma Aorta
31. Chronic Glomerulonephritis
32. Hydronephrosis
33. Vesical calculus

34. Wilm's Calculus
35. Carcinoma – Kidney
36. Carcinoma – Penis
37. Seminoma Testis
38. Mucinous cyst adenoma
39. Dermoid Cyst – Ovary
40. Leiomyoma Uterus
41. Hydatidiform Mole
42. Osteoclastoma
43. Osteo Sarcoma
44. Fibro adenoma Breast
45. Carcinoma Breast
46. Multinodular Goitre
47. Micro nodular and macro nodular cirrhosis
48. Meningitis
49. Amoebic liver abscess
50. Gangrene foot / hand
51. Infarction – heart
52. Infarction – spleen
53. Infarction – lung
54. Carcinoma of Cervix
55. Carcinoma of Stomach
56. Chronic Pyelonephritis
57. Amyloid spleen

LIST OF CHARTS FOR DISCUSSION & SPOTTERS :

1. T.B. Meningitis
2. Viral Meningitis
3. Pyogenic Meningitis
4. Nephrotic Syndrome
5. Nephritic Syndrome
6. Acute Lymphoblatic Leukemia
7. Acute Myloblastic Leukemia
8. Chronic Lymphatic Leukemia
9. Chronic Myeloid Leukemia
10. Microcytic Hypochromic anaemia
11. Haemolytic anaemia (Thalassamia, Sickle Cell anaemia)
12. Bone Marrow Megaloblastic anaemia
13. Blood Parasites (Malaria, Filaria)
14. Multiple Myeloma
15. Spherocytic anaemia with Hemolytic Jaundice
16. Obstructive Jaundice
17. Diabetic Ketoacidosis
18. Hepatic Jaundice
19. Vaginal Smear Carcinoma Cervix
20. FNAC – Fibro Adenoma Breast
21. FNAC – Infiltrating Duet Carcinoma Breast

UNIVERSTIYEXAMINATION

Written Paper :

There shall be two theory paper of 100 marks each. It shall have 3 types of questions.

1.	Long Essay	-	02 questions of 10 marks each	20
2.	Short Essay	-	10 questions of 05 marks each	50
3.	Short Answer	-	10 questions of 3 marks each	30
			Total	**100**

Paper – I (General Pathology, Clinical Pathology and Haematology)

1.	General Pathology	-	50 marks
2.	Haematology	-	20 marks
3.	Clinical Pathology	-	15 marks
4.	Clinical Haematology	-	15 marks

Paper – II (Systematic Pathology)

1.	Cardiovascular system		
2.	Respiratory system		
3.	Alimentary system including diseases of Liver, Gall Bladder and Exocrine Pancreas	-	40 marks
4.	Endocrine system Disease of Thyroid, Adrenals, Parathyroid, Pitutary and Endocrine Pancreas.	-	20 marks
5.	Lymphoreticular system		
6.	Skin and Nervous system		
7.	Renal system		
8.	Male and Female Genital System, Breast.	-	40 marks
9.	Musculoskeletal system		
10.	Ocular pathology		

Practical Examination :

1.	Spotters		-	15 Marks
2.	Haematology Exercise	Slide	-	10 Marks
		Chart	-	10 Marks
3.	Urine Examination with clinical history and findings and interpretations.		-	15 Marks
4.	Chart - Clinical pathology & Cytology.		-	10 Marks
5.	Haemoglobin / Blood grouping		-	10 Marks
6.	Histopathology slide discussion with Reporting.		-	10 Marks
	Total			**80 Marks**

Viva-Voce Examination:

The oral examination shall carry 40 marks and all the examiners will conduct the oral examination

1.	General Pathology	-	10 Marks
2.	Clinical Pathology and Haematology	-	10 Marks
3.	Systemic Pathology – I (C.V.S., R.S., G.I.T., Endocrines)	-	10 Marks
4.	Systemic Pathology – II (Renal System, Bones & Joints Male & Female Reproductive System, Skin & C.N.S., Lymphnode & Spleen)	-	10 Marks
	Total	**-**	**40 Marks**

D. RECOMMENDED BOOKS :

1. ROBBINS (Stanley L) Et. AL, Pathologic Basis of Diseases. Ed 7. Prism Books Pvt. Ltd., Bangalore.
2. MOHAN (Harsh), Textbook of Pathology, Edn. 5, Jaypee Brothers, New Delhi.
3. FIRKIN (Frank) et al. de Gruchy's Clinical Haematology in Medical practice Ed t. Oxford University Press, Delhi 1989, P 524, Rs. 475. FIRKIN (Frank) et al, de Gruchy's Clinical Haematology in Medical practice Ed 5. Oxford Universtiy Press. Delhi 1989, P 524, Rs. 475.
4. WALTER (JB) and Israel (MS), General Pathology, Ed. 7, Churchill Livingstone, Edinburgh, 1996, P-952, £ 25.
5. Govan (Alasdair) et al., Pathology, Illustrated, Ed. 4, Churchill Livingstone, Edinburgh, P-843, £10.95
6. SOOD (Ramnik) Medical Laboratory Technology, Ed. 4., Jaypee Brothers, New Delhi, 1996, P-740, Rs. 200/-

REFERENCE BOOKS :

LEVEL - 1

1. Robbins SL., Kumar V. Cotran R.S., Pathologic basis of Diseases, Ed VII ed., Prisim Books Pvt., Ltd., Bangalore.
2. Harshmohan – Text Book of Pathology, Ed. V ed., Jaypee. Brothers, New Delhi.
3. Govan ADT, Fiona R., Pathology illustrated, Chruchill livingstone Edinburgh.
4. Sood R., Medical Laboratory Technology, Jaypee. Brothers, New Delhi.
5. Mc Gee (Jaures) Et al., Oxford Textbook of Pathology, Ed I, Vol. I 2a and 2b, Oxford University Press, Oxford, 1992, P-2344.
6. KISSANE(John) Anderson's Pathology, Ed-10, Vol. I & II. The CV Mosby Compnay, St. Louis, 1996, P 2905. Rs. 2000/-
7. CURRAN (RC), Colour Atlas of Histopathology, Ed-3, Harvery Miller Publishers, Oxford Universtiy Press, New York, 1985, P-292, Rs.1295/-
8. MOIC SWEEN (Roddie) and Whaley (Keith), Muir's Text Book of Pathology, Ed-13, ELBS 1992, P-1245, £9.5.

9. DACIE(Sir John) and LEWIS(SM), Practical Haematology, Ed. 8. Chruchill Livingstone, London 1991, P-556, £10.5.
10. RUBBIN (Emanuel) and FABER (John). Pathology, Ed. 4., J.B. Lippincott Company, Philadelphia, P-1576, $ 75.

LEVEL - 2

1. SYMMERS (WSTC), Systemic Pathology, Ed-3, Vol. 1-16, Churchill Livingstone, Edinburgh 1995.
2. JONES (Howond) and JONES (Geogeanna), Novak's Text Book of Gynecology, Ed. 10. Williams and Wilkins, 1981, P-871, $47.50.

LEVEL - 3

1. ROSAI (Juan), Ackermann's Surgical Pahology, Ed. 10, the C.V. Mosby Company, St. Lois, 1996, P-2732, Rs. 2000/-
2. RAPHAEL (Stanley), Lynch's Medical Laboratory Technology, Ed-4, WB Saunder's Company, London 1983, P-845.
3. LEE (Richard) Et al. Wintrobes Clinical Haematology, Ed-10, Vol. 1 & 2, Williams and Wilkins 1998, P-2680, $179.00
4. HENRY (John) : Clinical Diagnosis and Management by Laboratory Method, Ed-19, WB Saunder's Company, London. A Prism Indian Edition, 1996, P-155 Rs.700/- (Jaypee).

* Specification mentioned such as edition, number of pages, cost etc., subject to change with newer edition.

MICROBIOLOGY

1. GOAL

The goal of teaching Microbiology is to provide understanding of the natural history of infectious diseases in order to deal with the etiology, pathogenesis, pathogenicity, laboratory diagnosis, treatment, control and prevention of these infectious diseases.

2. EDUCATIONAL OBJECTIVES

(a) Knowledge

The student at the end of one and half years should be able to: -

1. State the etiology, pathogenesis and methods of laboratory diagnosis and apply that knowledge in the diagnosis, treatment, prevention and control of communicable diseases caused by microorganisms.

2. Understand commensal, opportunistic and pathogenic organisms of human body and describe host parasite relationship.

3. To know the source and modes of transmission of pathogenic and opportunistic micro-organisms.

4. To choose appropriate sample for laboratory investigations required for clinical diagnosis and to apply the immunological techniques in lab diagnosis.

(b) Skills

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

2. Identify common infectious agents with the help of laboratory procedure, acquire knowledge of antimicrobial agents, use of antimicrobial sensitivity tests to select suitable antimicrobial agents for treatment.

3. Perform simple laboratory tests, which help to arrive at rapid diagnosis.

4. Be conversant with proper methods of collection, storage & transport of clinical material for microbiological investigations.

5. Understand the principles of immunology and its application in the diagnosis and prevention of infectious diseases including immunization schedule, acquire knowledge of the scope of immunotherapy and different vaccines available for the prevention of infectious diseases.

6. Understand methods of disinfection and sterilization and their application to control and prevent hospital and community acquired infections including universal biosafety precautions and waste disposal.

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

8. The student should be well equipped with the knowledge of prevalent infectious diseases of national importance and of the newer emerging pathogens.

(C) Attitude

1. The student will be regular, sincere, punctual and courteous and regular in studies.
2. The student will follow all the rules laid down by the department and participate in all activities.
3. The student will understand the importance of, and practice asepsis, waste segregation and appropriate disposal.
4. The student will understand the importance of, and practice the best methods to prevent the development of infection in self and patient. (E.g. hand washing, using aprons for hospitals in hospitals only, regularly washing the aprons, wearing gloves (as and when required / handling specimens etc.).
5. The student will understand the use of the different antimicrobial agents including antibiotics to use judiciously and prevent misuse, (prescribing attitude).
6. The student will wash his/her hands with soap after each practical class.
7. The student will leave the area allotted for his practical neat and tidy.
8. The student will discard the slides in the appropriate container provided for the same.
9. The student will report any injury sustained in class, immediately.
10. The student will report any breakage occurring during class times immediately.
11. The student may give suggestions to improve teacher student association.

Total number of teaching hours allotted for Microbiology 250 hrs

SYLLABUS OF MICROBIOLOGY

Distribution of Lecture hours

Sl. No.	Name of the Unit	No. of hours
1	General Bacteriology	10
2	Immunology	15
3	Systemic Bacteriology	34
4	Virology	20
5	Mycology	08
6	Parasitology	22
7	Applied Microbiology	13
	Total No. of Hours	**122**

Teaching hours divided as follows:

1. Lecturers 122 Hrs
2. Integrated teaching 14 Hrs
3. Practicals 72 Hrs
4. Internal assessment 18 Hrs

Grand Total : 226 hrs

b. & c. Sequential organisation of contents and their division

The areas of study in Microbiology will include General Microbiology, Systemic Bacteriology, Immunology, Mycology, Virology, Parasitology and Applied microbiology.

A) GENERAL MICROBIOLOGY: (Total Hrs = 10)

Sl. No	*Topic of lecture*	*Must know*	Desirable to know	*Hrs*
1.	Introduction and Historical background	Definitions: Medical Microbiology, pathogen, commensal, symbiont. Scientists and their contributions in the field of Microbiology. Antony van Leeuwenhoek, Louis Pasteur, Joseph Lister, Robert Koch, Paul Ehrlich, Alexander Flemming.	Nobel laureates in Microbiolgy. Micro-organisms as models in Molecular Biology and Genetic Engineering.	1
2.	Classification of micro-organisms and Morphology of bacteria	Microscopy: different types of microscopes and its uses. Difference between prokaryotes and Eukaryotes. Bacterial cell and its organelles, morphological classification, methods of studying bacteria, staining methods & their principles.		1
3.	Physiology of bacteria including growth requirements & metabolism	Nutrition, respiration (anaerobic & aerobic) and growth of bacteria, growth curve, physical factors influencing growth. Culture media: Definition, classification and its application. Important culture media. Methods of preservation of bacteria.		1
4.	Sterilization and Disinfection	Definition of sterilization, disinfection, asepsis, antiseptics. Enumeration of physical and chemical methods of sterilization including principle & their application. Testing of Disinfectants. Disinfection of Operation Theatre and skin.	Biosafety cabinet. Safety practices in microbiology. Central Sterile Supply Department (CSSD), HEPA filters, Plasma gas sterilization and newer methods	2

5.	Hospital waste Management	Definition of Biomedical waste, Categories, segregation, transport and disposal (including colour coding and types of container).		1
6.	Bacterial genetics	Introduction to bacterial genetics, extrachromosal genetic elements, Mutation, transmission of genetic material, F factor, C factor, R factor, Transposable genetic elements. Genetic mechanism of drug resistance, Genetic Engineering, Recombinant DNA technology, Nucleic acid probes, PCR, Blotting technique.	Genetic mapping Gene therapy	2
7.	Normal bacterial flora	Introduction, Host parasite Relationship -Commensal, Pathogens and Opportunists. Classification - resident and transient flora. Normal flora – Introduction, various sites, types and role.		1
8.	Infection	Types of infections. Sources, mode of spread of infection. Bacterial virulence factors. Attenuation, Exhaltation.		1

B) IMMUNOLOGY: (Total Hrs = 15)

Sl. No.	Topic	Must know	Desirable to know	Hrs
1.	Immunity	Introduction, Definition and types of immunity, factors responsible, mechanism of innate and acquired immunity, Herd immunity and local immunity.		1
2.	Antigens	Definition, determinants of antigenicity, properties of antigen, Haptens, MHC, HLA, Super antigens.	Biological classes of antigens.	1

3.	Antibodies	Introduction, structure of immunoglobulins, isotypic, allotypic and idiotypic markers, immunoglobulin classes, biosynthesis and metabolism of immunoglobins. Monoclonal antibodies.	Abnormal immunoglobins.	1
4.	Complement system	Definition, synthesis, pathways, activation, role & biological functions, components, measurement. Complement deficiency diseases.	Regulation of complement activation	1
5.	Antigen and antibody reactions	Introduction, general features of antigen- antibody reactions, measurement of antigens and antibodies. Principle, types and application of precipitation and agglutination, complement dependent tests, enzyme immunoassay, radioimmunoassay, immunofluoroscence test, neutralization and opsonisation. Immunoelectroblot techniques		3
6.	Structure and functions of immune system	Introduction, central and peripheral lymphoid organs, cells of lymphoreticular system, T and B cell maturation, antigen presenting cells, MHC, NK cells, TCR.		2
7.	Immune response	Introduction, Humoral immunity, factors affecting antibody production, adjuvants, cell mediated immunity, cytokines and its clinical applications, theories of immune response, immunetolerance.	Tests for detection of humoral and cell mediated immunity.	2
8.	Hypersensitivity	Definition, classification, difference between immediate and delayed reaction, type I (anaphylaxis, atopy), type II	Shwartzman phenomenon, type V reaction, type VI reaction	2

		(cytolytoxic and cytolytic), type III (serum sickness, arthus reaction), type IV (cell mediated or delayed reaction).		
9.	Autoimmunity and Immunodeficiency diseases	Definition, mechanism, classification and pathogenesis of autoimmune diseases. Classification, examples, manifestations of immunodeficiency disease and laboratory tests for detection.		1
10.	Transplantation & tumour immunology	Introduction, Types of transplants, mechanism of transplants, allograft rejection, clinical features and prevention of graft rejection, GVH reaction, tumour antigens, mechanism of immune response to tumours, immune surveillance.	Immunotherapy to cancer	1

C) SYSTEMIC BACTERIOLOGY: (Total Hrs = 34)

Must know about each Bacteria: Introduction, species, morphology, cultural characteristics, biochemical reactions, antigenic structure, virulence factors, pathogenicity, clinical features, laboratory diagnosis, antibiotic sensitivity, treatment, prevention and control.

Sl. No.	Topic	Must know	Desirable to know	Hrs
1.	Identification of bacteria	Morphology of bacteria (staining reactions), motility, cultural characteristics, resistance, metabolism, biochemical tests, antigenic structure, pathogenicity tests and typing methods.	Rapid identification methods	1
2.	Staphylococcus	Staphylococcus aureus, MRSA, Coagulase negative staphylococcus,	Micrococcus	1
3.	Streptococcus	Classification, Streptococcus pyogenes, Streptococcus agalactiae,	Group R and S streptococci	1

		Other haemolytic streptococci, Viridans streptococci		
4.	Enterococcus and Pneumococcus	Enterococcus faecalis, faecium and durans, Pneumococci	Vancomycin resistant enterococci	1
5.	Neisseria	Neisseria gonorrhoeae, Neisseriae meiningitidis, Non pathogenic neisseriae species	Moraxella catarrhalis	1
6.	Corynebacterium	Corynebacterium diphtheriae, other medically important corynebacterium species, Diphtheroids.	Schick's test	1
7.	Bacillus	Bacillus anthracis, Anthracoid bacilli, Bacillus cereus.	Bacillus subtilis, Bacillus stearothermophilus	1
8.	Clostridium	Classification, Clostridium perfringens, Clostridium tetani, Clostridium botulinum, Clostridium difficile		2
9.	Non sporing anaerobes	Anaerobic cocci and bacilli.		1
10.	Mycobacterium	Classification, Mycobacterium tuberculosis, RNTCP, Atypical mycobacteria, Mycobacteria leprae.		3
11.	Enterobacteriaceae	Classification, Coliforms – Escherichia coli Klebsiella, Proteus Salmonella – gastroenteritis, enteric fever, septicaemia. Shigella	Edwardsiella, Citrobacer, Enterobacter, Hafnia, Serratia, Morganella, Providencia, Erwinia	4
12.	Yersinia, Pasteurella and Francisella	Yersinia pestis, and enterocolitica. Francisella tularensis, Pasteurella multocida.		1
13.	Vibrionaceae	Vibrio cholerae, Halophilic vibrios, Aeromonas,	Plesiomonas, Vibrio mimicus	2
14.	Campylobacter,	Campylobacter jejuni, C.		1

	helicobacter	lari and C. coli, Helicobacter pylori		
15.	Pseudomonas, Burhkolderia	Pseudomonas aeruginosa, Burkholderia mallei and B. pseudomallei, Acinetobacter.	Burkholderia cepacia, other non-fermenters	1
16.	Haemophilus	Haemophilus influenzae, and H. ducreyi (chancroid)	HACEK group	1
17.	Brucellaceae	Brucella melitensis, B. abortus and B. suis	Brucella ovis and B. canis.	1
18.	Bordetella	Bordetella pertussis and B. bronchiseptica		1
19.	Spirochataceae	Classification, Treponema pallidum Nonveneral trepanomatosis, Non pathogenic treponemes. Borrelia recurrentis, B. burgdorferi and B. vincentii. Leptospira.		2
20.	Mycoplasma and Ureaplasma	Mycoplasma pneumoniae and other mycoplasma species, Ureaplasma urealyticum, Atypical pneumonia, Non gonococcal urethritis		1
21.	Actinomycetes	Actinomyces, Nocardia		1
22.	Rickettsiaceae	Genera Rickettsia, Orienta, Erhlichia, Coxiella and Bartonella.		1
23.	Chlamydia and Chlamydophila	Chlamydia trachomatis, Chlamydophila psittaci, Chlamydophila pneumoniae		1
24.	Miscellaneous Bacteria	Listeria monocytogenes, Legionella pneumophila, Erysipelothix, Gardnerella vaginalis, Spirillum minus, Calymmatobacterium granulomatis	Alcaligenes faecalis, Chromobacterium violaceum.	2
25.	Bacteriology of water, milk and air .	Importance of water-borne and milk-borne disease, Bacteriological testing of water,	Bacteriological examination of environmental dust.	1

		Bacteriology of milk and air, Measurement of air contamination,		

D) MYCOLOGY: (Total Hrs = 8)

No	Topic	Must know	Desirable to know	Hrs
1.	Introduction to Mycology	Introduction, Classification of fungi. Characteristics, Lab Diagnosis, Antifungal agents.	Industrial importance of fungi.	1
2.	Superficial cutaneous mycosis	Malassezia infections, Pityriasis versicolor, Tinea nigra, black and white Piedra, Dermatophytoses.		2
3.	Subcutaneous mycosis	Mycetoma, Rhinosporidiosis, Chromoblastomycosis, Sporotrichosis.		1
4.	Systemic mycosis	Histoplasmosis, Blastomycosis, Coccidioidomycosis, and Paracoccidioidomycosis.		1
5.	Yeast and yeast like fungi	Candida and Cryptococcus	Other yeasts.	1
6.	Opportunistic mycosis	Aspergillosis, Zygomycosis, Pneumocystosis, Penicillium marneffei, Mycotoxins and Mycetismus.		2

E) VIROLOGY: (Total Hrs = 20)

Morphology, pathogenesis, laboratory diagnosis, prevention and control for all viruses (Must know).

Sl. No.	Topic of lecture	Must know	Desirable to know	Hrs
1.	General Virology	Introduction, morphology, replication of viruses, viral genetics and classification of viruses.		1
2.	Virus Host interactions	Introduction, pathogenesis, viral infection, host responses to viral infections.		1
3.	Laboratory diagnosis of viral infections	Collection of samples, transport, cultivation and methods of diagnosis and antiviral drugs.		1

4.	Pox viruses Adenovirus	Variola virus, Vaccinia virus, Molluscum contagiosum. Adenovirus, Adenoassociated viruses.	ORF, cowpox	1
5.	Herpes viruses	Classification, Herpes simplex, Varicella zoster, Cytomegalovirus, Epstein Barr Virus	Human herpes viruses 6,7 and 8.	2
6.	Orthomyxoviruses	Classification, Influenza viruses, H1N1 flu		1
7.	Paramyxoviruses	Measles virus, Parainfluenza virus, Mumps virus, and Respiratory syncytial virus.		1
8.	Picornaviruses	Classification, Polio, Coxsackie, Enteroviruses, ECHO viruses, Rhinovirus		2
9.	Rhabdoviruses	Rabies	Rabies relates viruses, Lassa virus	1
10	Arboviruses	Introduction, classification, enumeration in India, pathogenesis, laboratory diagnosis and control.		2
11	Hepatitis viruses	Classification, Hepatitis A, B, C, D, E viruses	Hepatitis G virus	2
12	Retroviruses	Classification, Human immunodeficiency virus.	HTLV	2
13	Slow and Oncogenic viruses	Characteristics of Slow virus infections, pathogenesis, laboratory diagnosis and viruses associated with it.		1
14	Miscellaneous viruses	Rubella virus, Viral haemorrhagic fever, Viral diarrhoea, SARS, Papova viruses	Parvoviruses.	1
15	Bacteriophage and viral vaccines	Bacteriophage, Viral vaccines: classification, route of introduction, adverse effects and immunization schedule. Newer vaccines.		1

F) PARASITOLOGY: (Total Hrs = 22)

No	Topic of lecture	Must know	Desirable to know	Hrs
1.	Introduction to medical Parasitology	Introduction, history, classification, explanation of terminologies, epidemiology,	Immunity in parasitic infections	1

		pathogenicity and laboratory diagnosis of parasitic infections. General characters of Protozoas and Helminths		
2.	Entamoebae	Classification of Amoeba. Entamoeba histolytica and differentiation between Entamoeba species.	Endolimax and Iodoamoeba	1
3.	Free living amoebae	Free living amoebae, PAME	Balamuthia mandrillaris	1
4.	Flagellates	Introduction and classification of Flagellates. Intestinal and vaginal flagellates (Giardia lamblia & Trichomonas)	Dientamoeba fragilis and oral flagellates	1
5.	Hemoflagellates	Introduction to Hemoflagellates. Trypanosomes: classification, Trypanosoma burcei complex and Trypanosoma cruzi.	Trypanosoma rangeli	1
6.	Hemoflagellates and Ciliata	Leishmania: classification. Leishmania donovani. Cutaneous and mucosal leshmaniasis. Balantidium coli		2
7.	Apicomplexa	Malarial parasites	Babesia	2
8.	Coccidia	Toxoplasma, Cryptosporidium, Isospora, Cyclospora	Microsporida and Sarcocystis	2
9.	Helminthology Intestinal Nematodes	General characteristics and classification Ascaris lumbricoides & Trichuris trichura		1
10.	Intestinal Nematodes	Hook worms, Larva migrans and Enterobius vermicularis		1
11.	Intestinal Nematodes	Strongyloides stercoralis and Trichinella spiralis		1
12.	Somatic Nematodes	Filarial worms and Dracunculus medinensis		2

13.	Cestodes	Taenia saginata & solium. Cysticercus cellulosae		1
14.	Cestodes	Echinococcus granulosus	Echinococcus multilocularis	1
15.	Cestodes	Hymenolepis nana and Diphyllobothrium latum	Hymenolepis Dimunita	1
16.	Intestinal and Somatic Trematodes	Fasciolopsis buski, Fasciola hepatica, Clonorchis sinensis, Paragonimus westermani, etc.		2
17.	Blood Trematodes	Schistosomiasis		1

G) APPLIED Microbiology (Total Hrs = 13)

No	Topic of lecture	Hrs
1.	Hospital acquired infections	1
2.	Pyrexia of unknown origin	1
3.	Urinary tract infections	1
4.	Sexually transmitted diseases	1
5.	Diarrhoeal diseases and Food poisoning	1
6.	Zoonotic diseases	1
7.	CNS infections	1
8.	Infections in immunocompromised individuals.	1
9.	Skin and soft tissue infections	1
10	Eye and ear infections	1
11	National programs of communicable diseases	1
12	Investigation of outbreaks and notification.	1
13	Vaccination and immunization schedule	1

INTEGRATED TEACHING Total Hrs = 14

Sl. No.	Topic	Hrs
1.	Tuberculosis	2
2.	Leprosy	2
3.	Pyrexia of unknown origin (PUO)	2
4.	Sexually Transmitted Diseases (STD)	2
5.	Transfusion-transmitted infections – HBV, HCV and HIV	2
6.	Malaria	2
7.	Diarrhoea and Dysentery	2

PRACTICAL

Practical exercises (Total Hrs = 72)

Sl. No.	Topic of Practicals	Hrs
1.	Introduction To microbiology Practicals, Microscopy and Micrometry	2
2.	Methods of Staining of Bacteria Simple stain, Grams, AFB and Albert's staining	8
3.	Sterilization – Hot Air Oven, Autoclave, centrifuge, Laminar flow and working of microbiology laboratory and CSSD.	2
4.	Culture Media and Methods of inoculation. Aerobic and anaerobic	4
5.	Identification of Bacteria – Morphology, Hanging drop and Biochemical Tests.	2
6.	Antimicrobial Susceptibility Testing by Kirby Bauer Disc Diffusion method.	2
7.	Spotters Discussion – Instruments and uninoculated medias.	2
8.	Collection, transportation, storage and processing of Specimens in microbiology laboratory.	2
9.	Laboratory diagnosis of Pyogenic infections.	2
10.	Laboratory diagnosis of Diphtheria.	2
11.	Laboratory diagnosis of Tuberculosis.	2
12.	Laboratory diagnosis of Urinary Tract Infection.	2
13.	Laboratory diagnosis of Meningitis.	2
14.	Laboratory diagnosis of PUO.	2
15.	Laboratory diagnosis of diarrhea and dysentery.	2
16.	Spotters and Slide Discussion – Inoculated medias, biochemical reactions and acteriological slides.	2
17.	Serological test for Enteric fever - WIDAL.	2
18.	Serological test for Syphilis - VDRL.	2
19.	ASO	2
20.	CRP	2
21.	RA	2
22.	Lab diagnosis of Viral Infections – viral culture, HA, HI, ELISA, Western blot.	4
23.	Laboratory diagnosis of Hepatitis B viral infection.	2
24.	Laboratory diagnosis of HIV infection.	2
25.	Slides discussion – virology slides.	2
26.	Lab Diagnosis of Fungal Infections - KOH, Lactophenol cotton blue and Slide culture.	2
27.	Demonstration of dermatophytes culture and slides.	2
28.	Demonstration of yeast and yeast-like, opportunistic fungi.	2
29.	Lab Diagnosis of Parasitic Infections –	2
30.	Spotters discussion – specimens of parasites and slides.	2
31.	Experimental animals used in Microbiology	2

SPOTTER LIST FOR II MBBS

The following are the spotters:

CULTURE MEDIA WITHOUT GROWTH

1. Peptone Water
2. Glucose Broth
3. Nutrient Agar
4. Blood Agar
5. Chocolate Agar
6. Mac Conkey's Agar
7. TCBS Agar
8. LJ Medium
9. RCM
10. Dorset's egg medium
11. Milk Agar
12. Selenite F broth
13. Castaneda Blood Culture Medium
14. Loeffler's Serum Slope
15. Wilson and Blair Media
CULTURE MEDIA WITH GROWTH
1. Staphylococcus colonies on Nutrient Agar
2. Staphylococcus colonies on Milk agar
3. C. diphtheriae on TBA
4. LJ medium with growth.
5. Wilson and Blair with growth
6. TCBS with growth
7. Proteus on Nutrient agar
8. Mac Conkey Agar with LF and NLF
9. Sugar Fermentation Tests
10. Indole Test
11. Urease Test
12. Citrate Test
13. Triple sugar iron agar test
14. Antibiotic Sensitivity Plate

BACTERIOLOGY SLIDES :

1. Staphylococci
2. Streptococci
3. Pneumococci
4. Gonococci
5. Corynebacterium diphtheriae
6. M. tuberculosis
7. Mycobacterium leprae
8. Bacillus anthracis

9. Clostridium tetani
10. Yersiniae pestis
11. Treponema pallidum
12. Actinomycetes

MYCOLOGY SLIDES :

1. Candida
2. Cryptococcus neoformans
3. Microsporum gypseum
4. Trichophyton mentagrophytes
5. Epidermophyton floccosum
6. Aspergillus flavus
7. Aspergillus fumigatus
8. Penicillium
9. Rhizopus
10. Mucor
11. Rhinosporidiosis
MYCOLOGY COLONIES ON SDA
1. Candida
2. Cryptococcus neoformans
3. Microsporum gypseum
4. Trichophyton rubrum
5. Epidermophyton floccosum
6. Aspergillus niger
7. Aspergillus flavus
8. Aspergillus fumigatus
9. Mucor
10. Penicillium

PARASITOLOGY SPECIMENS

1. Round worm
2. Tape worm
3. Hydatid Cyst
4. Hook worm
5. Guinea worm
PARASITOLOGY SLIDES
1. Gametocyte of P.flaciparum
2. Gametocyte of P.vivax
3. Trophozoite of P.vivax
4. Microfilaria
5. Cestode segment
6. Cyclop
VIROLOGY SPECIMEN

1. Embryonated Egg
VIROLOGY SLIDES
1. Negri bodies
2. Molluscum contagiosum
INSTRUMENTS
1. Mc Intosh Flides Jar
2. Seitz filter, candle filter and sintered glass filter
3. Widal rack and tubes
4. VDRL Slide
5. Sterile Cotton Swab
6. Tuberculin Syringe
7. Sterile Disposable Syringe
8. Inoculation Wire Loop
9. Pasteur Pipette
10. Microtitre Plate
11. Surgical Gloves
12. NIH swab
ANIMALS
1. Rabbit
2. Guinea Pig
3. Mice
4. Suckling Mouse

TERM WISE DISTRIBUTION OF THEORY PORTIONS

II Phase – I Term

General bacteriology, Immunology and Systemic Bacteriology (Gram positive and Gram negative cocci)

II Phase – II Term

Remaining Systemic Bacteriology and Mycology.

II Phase – III Term

Parasitology, Virology and Applied microbiology

SCHEME OF EXAMINATION

Internal assessment:

It shall be based on evaluation of assignment, seminar and periodical examination.

Theory: 60 marks

A minimum of three theory examinations are recommended in 2nd phase 1st, 2nd and 3rd term. The 3rd term examination preceding the university examination will be similar to pattern of university examination. The total internal marks would be 60**.** The average marks of the all the three internal examinations will be taken.

Practicals: **20 marks**

A minimum of three practicals test will be conducted; one at the end of each term, the third practical examination will be similar to university examination.

UNIVERSITY ASSESSMENT IN MICROBIOLOGY :

The student will be assessed on the must know category in knowledge and skill.

Categories	Marks
Theory	200
Paper I	100
Paper II	100
Theory internals	60
Viva-voce	40
Practicals	80
Practicals internals	20
Total marks	**400**

Paper I - 100 marks

Two main questions:

One clinically oriented. Each question carries 10 marks. 2 X 10 = 20

Ten short assay questions each carrying 5 marks. 10 X 5 = 50

Ten short answers each carrying 3 marks. 10 X 3 = 30

Subject content: (inclusive of related applied aspects)

Gen. Microbiology 20 marks

Immunology 20 marks

Systematic Bacteriology 40 marks

Paper II - 100 marks

Two main questions:

One clinically oriented. Each question carries 10 marks.	2 X 10 = 20
Ten short assay questions each carrying 5 marks.	10 X 5 = 50
Ten short answers each carrying 3 marks.	10 X 3 = 30

Subject content: (inclusive of related applied aspects)

Parasitology	40 marks
Virology	30 marks
Mycology	10 marks
Internal assessment theory	60 marks
Viva voce	40 marks

Practicals: 100 marks

Procedures: 80 marks

1. Spotters – 10 marks
2. Grams stain -10 marks
3. Z-N Stain -10 marks
4. Stool Examination -10 marks
5. Applied exercises-
   A. Applied Bacteriology – 10 marks
   B. Applied Mycology – 10 marks
   C. Applied Virology – 10 marks
   D. Applied Parasitology -10 marks

Internal assessment practicals: 20 marks

Suggested Books in Microbiology:

1. Textbook of Microbiology by Ananthanarayan & Paniker
2. Textbook of Microbiology by D R Arora
3. Textbook of Microbiology by C P Baveja
4. Textbook of Microbiology by chakraborthy
5. Textbook of Microbiology by Jawetz

6. Textbook of Parasitology by D R Arora
7. Textbook of Parasitology by chatterjee
8. Textbook of Parasitology by Rajesh karyakarte and Ajit Damle.
9. Textbook of Parasitology by R Bhatia & R L Ichpujari
10. Text book of Mycology by Jagadish chander.

Reference books:

1. MIMS et al, Pathogenesis of Infectious diseases.
2. Roitt, Essential Immunology
3. Mackie and MacCartney- Vol I and II
4. Bailey and Scott Diagnostic Microbiology.
5. Text book of Parasitology by Parija.
6. Stokes, Clinical Microbiology.
7. Cowan and Steel, Manual for the identification of medical Bacteria.
8. Manson-Barr, Manson's tropical diseases.
9. Mandell, principles and practice of infectious diseases.
10. Topley and Wilson, principles of Bacteriology, Virology, Immunity.

PHARMACOLOGY

GOALS AND OBJECTIVES

The student after completing the course in Pharmacology will be able to :

- ✓ Understand the general principles of drug action and the handling of drugs by the body.
- ✓ Select and prescribe suitable drug(s) according to the need of the patient for prevention, diagnosis and treatment of common ailments.
- ✓ Foresee, recognize, prevent and manage adverse drug effects.
  a. Avoid simultaneous use of drugs resulting in harmful interaction(s)
  b. Judiciously use rational drug combinations in the best interest of the patient.
- ✓ Be aware of the contribution of both drug and non drug factors in the outcome of treatment.
- ✓ Appreciate the essential drug concept and translate it in terms of drug needs for a given community.
- ✓ Judiciously use "over the counter" drug and be aware of ill effects of social use of intoxicants.
- ✓ Exercise caution in prescribing drug(s) likely to produce dependence and be aware of treatment strategies for drug dependence.
- ✓ Be aware of the drug treatment guidelines laid down for diseases covered under National Health Programmes.
- ✓ Prescribe drug(s) for the control of fertility.
- ✓ Be aware of possible adverse effects of drugs on the foetus while treating pregnant woman.
- ✓ Be aware of the age related factors while prescribing treatment in relation to infant children/ geriatric patients.
- ✓ Understand different types of Bio-medical waste, their potential risks and their management.

COURSE CONTENTS

1. GENERAL PHARMACOLOGY

Must know

1. Definition and scope of Pharmacology and its different branches, route of administration of drugs, advantages and disadvantages of different routes.
2. General principles of drug action. .
3. Basic principles of pharmacokinetics and its relevance to rational therapeutic~.
4. Biotransformation of drugs and factors affecting it.
5. Basic mechanisms of drug interactions.
6. Various types of adverse effects that can occur with therapeutic use of drugs. Concept of therapeutic index and margin of safety.
7. Mechanism of drug action; factors modifying drug action and dosage

including dose response relationship.

8. Drugs and drug combinations that are banned in India.
9. Bio-availability and bio-equivaJence of drugs.

1 – A : CLINICAL PHARMACOLOGY AND RATIONAL DRUG USE :

Must know

1. Introduction, definition and scope and relevance of clinical pharmacology
2. Clinical trials and new drug discovery
3. Bioavailability, bioequivalence, therapeutic index, calculation of basic pharmacokinetic parameters and its relevance to therapeutics.
4. Essential drug concept , fixed dose drug combinations, Pharmacoeconomics
5. Rational drug therapy
6. Drugs in children and pregnancy (perinatal pharmacology)
7. -Drugs in geriatrics.
8. Drug-drug interactions (with specific examples)
9. ADR monitoring and reporting (Pharmacovigilance)
10. Therapeutic drug monitoring and adherence.
11. Clinical use of drugs in hepatic and renal failure.
12. Pharmacoepidemiology, Drug regulations and Drug Acts.
13. Clinical trials: Basic concepts, including ethics.

Desirable to know :

14. Molecular mechanisms of drug action.
15. Modern drug delivery systems and principles underlying them.

2. AUTONOMIC NERVOUS SYSTEM

Must know

General principles of autonomic neurotransmission with reference to cholinergic and adrenergic systems; various types and sub-types of receptors and their agonists and antagonists.

1. Therapeutic indications, common side effects and contraindications of cholinomimetics (including anti-cholinesterases) and cholinergic blocking (antimuscarinic) drugs.Steps in the pharmacotherapy of organophosphorous and atropine poisonings, pharmacotherapy of glaucoma and myaesthenia gravis.
2. Therapeutic indications, common side effects and contraindications of alpha1, alpha2, beta1 and beta2 selective and non-selective adrenoreceptor agonist and antagonists.
3. Skeletal muscle relaxants: names, pharmacological actions, uses and side effects.
4. Drugs used in Parkinsonism.

Desirable to know : Molecular and biochemical mechanisms of action of cholinergic drugs. Adrenergic drugs and their blockers.

3. CARDIO- VASCULAR SYSTEM

Must know

1. a. Pharmacological actions of cardiac glycosides and the basis of their use in congestive heart ailure (CHF) and arrhythmias.
   b. Pharmacokinetics, drug interactions, adverse effects and contra indications of digoxin; treatment of digoxin toxicity.
   c. Approaches to the treatment of CHF and the status of diuretics, digitalis and vasodilators in its management.
2. a. Classification of antiarrhythmic drugs. Quinidine : pharmacological actions, adverse effects and indications. Treatment of paroxysmal supraventricular tachycardia, sudden cardiac arrest and ventricular fibrillation.
   b. Classification of antihypertensive drugs. Mechanism of action, adverse effects, drug interactions and basis of combining commonly used agents like Beta blockers, diuretics, ACE inhibitors, calcium channel blockers, clonidine.
   c. Management of hypertensive emergencies.
3. Classification of drugs used in anCClassification of drugs used in angina pectoris. Nitrates: pharmacological actions, mechanisms of beneficial effect in angina, adverse effects and phenomenon of nitrate tolerance.
4. Calcium channel blockers: pharmacological actions, adverse effects & indications
5. Approaches to the treatment of myocardial infarction.
6. Drug treatment of shock and peripheral vascular diseases.

Desirable to know

1. Amrinone : Pharmacological actions, adverse effects and indications.
2. Electrophysiological basis of action of antiarrhythmic drugs.

4. DIURETICS

Must know

1. Classification of diuretics: site of action of diuretics of different classes & pattern of electrolyte excretion under their influence.
2. Short term side effects and long term complications of diuretic therapy.
3. Therapeutic uses of diuretics.

Desirable to know

1. Anti diuretics
2. Diabetes insipidus.

5. DRUGS AFFECTING BLOOD AND BLOOD FORMATION

Must know

1. Antianaemic drugs
    a. Mechanisms of iron absorption ti'om gastrointestinal tract and factors modifying it Bioavailability, adverse affects and indications of oral and parenteral iron preparations Treatment of iron deficiency anemia.
    b. Indications of folic acid, Vit. B 12, Vit K.
2. Classification of anticoagulants. Mechanisms of action of heparin and or anticoagulants. Drug interactions with oral anticoagulants and treatment of bleeding due to their overdose.
3. Drugs inhibiting platelet aggregations, their indications and precautions in their use .
4. Properties and indications of plasma expanders.

Desirable to Know

1. Disadvantages of 'shot gun' anti-anemia preparations.
2. Name and indications of fibrinolytics and antifibrinolytics.
3. Hypolipoproteinemic drugs: mechanisms of action, adverse effects and indications.

6. AUTO COIDS AND RELATED DRUGS

Must know

1. Definitions of autocoids and their difference from hormones.
2. Pharmacological actions of the autacoids and their pathophysiological roles.
3. The subtypes of histamine receptors and the actions mediated through each.
4. Histamine H_1 receptor antagonists: classification, pharmacological actions, adverse etfects and therapeutic uses.
5. Angiotensin converting enzyme inhibitors: pharmacological actions, pharmaco-kinetics, adverse effects, drug interactions and therapeutic uses.
6. Established and potential therapeutic uses of prostaglandins and their analogues
7. Eicosanoids and Platelet Activating factor
8. Analgesics, Antipyretics, and anti- nflammatory drugs
9. Drugs used for Rheumatoid arthritis and Gout.

Desirable to know

1. Drugs which release histamine in the body and clinical implications of this property.
2. The sub types of 5-HT receptors and drugs, which act by modifying the serotonergic system.
3. Antioxidants

7. RESPIRATORY SYSTEM

Must know

Drugs used in management of asthma, common side effects and precautions to be taken during their use. Principles governing the selection of drugs for asthma.

Desirable to know

1. Classification of antitussives based on their mechanism of action, pharmacological actions, indications, contraindications and common side effects of antitussives.
2. Expectorants and mucolytic agents: out line of their mechanisms of action, indications, common side effects and precautions to be taken during their use. Principles of choosing appropriate combination of cough remedies.

8. GASTRO-INTESTINAL SYSTEM

Must know

1. Drugs for peptic ulcer.

a. Drugs used in the treatment of peptic ulcer and outline of pharmacological basis of the use of each.

b. Side effects, contraindications and precautions for the use of the various drugs used in peptic ulcer.

2. Antiemetic drugs and outline of their mechanism of action.
3. Drugs used in diarrhoea.

a. Symptomatic management of diarrhoea giving the pharmacological basis for the use of each drug / measure.

b. Oral rehydration powder

c. Indications for the use of anti microbials, anti-motility agents and anti secretory drugs.

4. Indications, limitations and hazards of purgatives.

Desirable to know

Drugs used in therapy of ulcerative colitis outlining the pharmacological basis for their use.

Side effects, contraindications and precautions during use of these agents

9. ENDOCRINE PHARMACOLOGY

Must know

1. Hormones of thyroid: physiological and pharmacological actions, indication, contraindications and common side effects of thyroid hormones used for replacement ar,_ for pharmaco therapy. Anti-thyroid drugs: pharmacological actions, adverse effects.
2. Hormones of the islets of Langerhans : Drugs used for pharmacotherapy of diabetes melliw, their contraindications, precluding their use and common side effects. Management (.. iatrogenic hypoglycemia and diabetic ketoacidosis.
3. Sex hormones: synthetic analogues and antagonists, uses in replacement and pharmacothcrap: outlining the rationale for sLlch use, Contraindications and common side effects.
4. Pharmacological approaches to contraception, Side effects, precautions during LIse c\. contraindications for the various modalities of drug induced contraception.
5. Uterine stimulants & relaxants: their indications, contraindications and important side effeCh
6. Hormones of adrenal cortex and their synthetic analogues: pharmacological action,. therapeutic uses, contraindications, precautions during their use and common side effect, General principles governing the pharmaco therapy with glucocorticoids.

Desirable to know

1. Hormones and drugs affecting calcium metabolism, their therapeutic indie<ition~. contraindications and common side effects.
2. Importance of drug induced alterations in prolactin levels.
3. Pharmacology of Anterior Pituitary hormones.

10. CENTRAL NERVOUS SYSTEM

Must know

1. Drugs used in epilepsy; selection of appropriate drugs for the various types of epilepsy and adverse effects of the drugs.
2. Hypnotics used currently in clinical practice with indications, contraindications, adverse effects and drug interactions of benzodiazepines.
3. Opioid analgesics: pharmacological actions, indications, contraindications and adverse effect of commonly used analgesics.
4. Aspirin and Aspirin like (NSAID's) drugs, their relative advantages and disadvantages. indications, adverse effects and drug interactions.

5. Agents used in the treatment of acute and chronic gout..
6. Role of disease modifying agents in the treatments of rheumatoid arthritis.
7. Pharmacological effects of ethanol in methanol poisoning.

11. PSYCHOPHARMACOLOGY

Must know

Drugs used for psychosis, anxiety, depression and manic depressive illness.

Desirable to know

Names of hallucinogens: actions and abuse potential of Cannabis indica, cocaine and opioids.

12. DRUGS IN ANAESTHETIC PRACTICE

Must know

1. General Anesthetics
    a. Cardinal features of general anesthesia.
    b. Merits and demerits of commonly used anaesthetic agents.
    c. Properties of thiopentone sodium as an inducing agent and the basis of its short duration of action.
    d. Complications of general anesthesia and drug interactions with general anesthetics.
2. Preanesthetic adjuvants: Names of drugs used in pre-anesthetic medication and the purpose of using each of them.
3. Local Anesthetics
    a. The pharmacological basis of local anaesthetic action and of combination of local anaesthetic agents with adrenaline.
    b. Common adverse effects of local anesthetics.
    c. Indications for the complications of spinal anesthesia.

Desirable to know

1. Other anesthetics like ketamine and neuroleptic analgesia.
2. The pharmacology of dantrolene and centrally acting muscle relaxants like diazepam, carisoprodol and baclofen.

13. CHEMOTHERAPY

Must know

1. General principles of chemotherapy, indications for prophylactic and combined - chemotherapeutic agents. Chemotherapeutic agents in the order of their choice for various infections and infestations, common side effects, contra indications and precautions
2. Antiseptics and disinfectants and their uses based on their Pharmacological propertie-
3. Anticancer drugs: mechanisms of action, use, Common side effects, contraindicaticons and precautions during use of various anticancer drugs.
4. Chemotherapy of drugs used in tuberculosis, leprosy, malaria, filaria, amoebiasis,kala-azar, enteric fever, worm infestation.
5. Anti fungal agents.
6. Chemotherapy of viral infections including possible approaches to treatment of viral infections like AIDS, avian flu and swine flu.

Desirable to know

1. Methods to circumvent toxic / side effects of chemotherapeutic agents wherever possible.
2. Chemotherapeutic agents in fungal infections: superficial and systemic.

14. TOXICOLOGY

Must know

1. General principles of treatment of poisoning.

Desirable to know

1. Heavy metal toxicity and heavy metal antagonists.
2. Management of over dosage with commonly used therapeutic agents.

15. CLINICAL PHARMACOLOGY AND RATIONAL DRUG USE

Must know

1. Principles of prescription writing.
2. Prescriptions of common disorders
3. Essential drug concept
4. Drugs in children and pregnancy (perinatal pharmacology)
5. Drugs in geriatrics
6. Drug-drug interactions (With specific examples)
7. Drug resistance.

Desirable to know

1. Therapeutic drug monitoring
2. Clinical use of drugs in hepatic and renal failure.

SKILLS

1. Plan and institute a line of treatment which is need based, cost effective and appropriate for
   common ailments taking into consideration:
   a. Patient
   b. Disease
   c. Socioeconomic status,
   d. Institutional / governmental guideline.
2. Identify irrational prescriptions and explain their irrationality.
3. Persuade patients to stick to therapeutic recommendations especially with reference to dosage and duration of therapy and monitor compliance.
4. Warn patients about important side effects of drugs without alarming them.
5. Recognize drug induced untoward effects and take appropriate steps to all of Them.

COMMON AREAS FOR INTEGRATED TEACHING OF PHARMACOLOGY

Sl. No.	Area	Collaborating Departments
01	Drugs in anesthetic practice	Anaesthesiology
02	Drug therapy of psychiatric disorders	Psychiatry
03	Principles of rational use of drugs	Medical, Pediatrics, Surgery, Obst. Gynae
04	The concept of essential drugs	Preventive and Social Medicine
05	Therapy of hypertension including Diuretics	Medicine and Physiology
06	Therapy of diabetes	Medicine and Physiology
07	Therapy of peptic ulcer	Medicine, Physiology & Surgery
08	Therapy of CCF	Medicine
09	Therapy of Asthma	Medicine
10	Therapy of Malaria	Medicine & Microbiology

TEACHING HOURS

THEORY : (120- 130 HOURS)

Theoretical coverage of various aspects of pharmacology could be covered in lectures, tutorials, group discussions, seminars etc., suitably spread over the three terms course for 1 Vi years. Stress to be given for the basic principles and pharmacotherapeutics basis for clinical use of drugs.

I- TERM (3rd Term) :

a. General Pharmacology :
History, Definitions and Routes of administration of drugs basic principles and clinical application of pharmacokinetics and pharmacodynamics. Rational approach to therapy : Concepts of essential drugs and rational drug prescribing and adverse drug reactions, cost benefits, therapeutic drug monitoring, drug monitoring drug toxicity, drug interactions, principles of assay of drugs: Bioassay, radioimmunoassay etc., Principles of drug development and clinical evaluation of drugs. - 12 hours

b. Pharmacology of ANS including Parkinsonism - 15 hours

c. Pharmacology of CVS including pharmacotherapy of shock and Hypolipidemic agents - 13 hours

d. Drug acting of blood and blood forming organs - 5 hours

II – TERM (4th term) :

a. Pharmacology of CNS including psychophamacology and drug dependence - 18 hours

b. Pharmacology of local anaesthetics - 2 hours

c. Diuretics and anti diuretics - 4 hours

d. Endocrine glands : Hormones of pituitary, hroid antithroid agents, adrenal corticoids, pancreatic hormones and antidiabetic agents, sex harmones including contraceptives. Drugs influencing calcium metabolism. - 15 hours

e. Biogenic amines and polypeptides - 6 hours

III – TERM (5th term) :

a. Chemotherapy :
Sulphonmides and Synthetic drugs, Antibiotics, Chemotherapy of bacterial, parasitic, fungal viral infections, Chemotherapy of malignancy. Drug therapy of scabies, pediculosis and other skin infections. **– 25 hours**

b. Antiseptic and disinfectants - 1 hour

c. Pharmacology of Respiratory system - 2 hours

d. Pharmacology of Gastrointestinal system - 5 hours

e. Drugs acting of Uterus - 1 hour

f. Miscellaneous : a) Chelating agents b) Vitamins
c) Immunosupressants and Immunostimulants
d) Drugs used gout & rheumatoid arthritis
e) Therapeutic gases and enzymes - 6 hours

PRACTICALS (144 HOURS)

The practical training should be made need based. It should be relevant to the future function of a basic doctor as well as make the student to understand some of the theoretical knowledge imparted to them through lectures. Some of the experiments in the experimental laboratory may be done by the students themselves

while others can be demonstrated depending upon the local conditions.

I - TERM :

Practical Pharmacy :

Mixtures, percentage, solutions, ointments, paints, pastes, powders, liniments etc., At least one exercise of each of these types of preparations to be done by the students. Exercises done in these are to be asked as practical exercise at the qualifying examination.

II – TERM :

Experimental Pharmacology :

Experiments designed to elucidate and demonstrate some basic principles like mechanism of drug action, drug antagonism, drug interactions etc are demonstrated and some done by the students.

Some of the exercises listed below may be suitably utilized or modified for the above purpose :

a. Frog heart preparation to show effect of autonomic drugs on ions.
b. Frog rectus preparation to show neuromuscular drug action.
c. Mammalian smooth muscle (rabbit, guinea pig, rat etc.,) to show drug effects and drug antagonism.
d. Mydriatic and miotic effects of rabbit pupil.
e. Drug action on ciliary movement of frog oesophagus.
f. Anaesthesia : Frog plexus, surface anaesthesia in rabbit's infiltration in guinea pig sulphonamides, astringents, corrosives etc. The exercises done as above could be included as exercise to be done by the candidate at the qualifying examination. However actual technique of preparation setting up is not to be asked for but administering and recording and interpreting of drug effects to be asked.

III TERM :

1. **Clinical Pharmacology :**
   - **a.** Clinical problem solving exercises oriented toward drug interaction, rational drug therapy etc.
   - **b.** Prescriptions for common clinical conditions.
   - **c.** Criticise, correct and rewrite the given prescriptions (Therapeutic and rug interactions oriented).
   - **d.** Therapeutic seminars : To be planned and carried out in collaboration with clinical attending to the cases.
2. **Demonstration :**
   - **a.** Effects of drugs on B P and respiration of dog.
   - **b.** Screening of anticonvulsants.
   - **c.** Screening of analgesics
   - **d.** Demonstration of pentobarbitone sleeping time
   - e. Demonstration of straub's tail reaction etc.

Exercises done under demonstration are not to be included as experiment – exercise to be carried by the candidate at the time of qualifying examination, but questions / table work based on these can be suitably included.

SCHEME OF EXAMINATION

INTERNAL ASSESSMENT:

It shall be based on evaluation assignment, preparation of seminar, clinical presentation etc., Regular periodic examinations should be conducted throughout the course. There should be a minimum of three (3) sessional examinations during Phase-II of the course and average of all three examination marks should be taken into consideration while calculating the marks of the internal assessment. Day to day records should be given importance in the internal assessment.

Proper record of the work should be maintained which will be the basis of all students' internal assessment and should be available for scrutiny.

THEORY: 60 Marks

Minimum of three examinations are recommended. The examination preceding the University examination will be similar to the University examination. The total marks would be 60. Average marks of all three notified internal examinations should be reduced to 60 and should be sent to the University.

PRACTICALS: 20 Marks

A minimum of three practical tests is to be conducted, on at the end of each term. Five marks will be for records and 15 marks for terminal examinations. Average marks of the three terminal examinations shall be reduced to 15 marks and added to the marks obtained for records and sum of the two shall be sent to the University.

UNIVERSITY EXAMINATION

WRITTEN PAPER: 200 Marks

There shall be two theory papers of 100 marks each and duration of each paper will be of 3 hours.

Type of question	No. of questions	Marks/question	Total
Long essay	2	10	20
Short Essay	9	5	45
Short answer/Give reason	5	3	15
MCQ's	20	1	20
		TOTAL	**100**

DISTRIBUTION OF CHAPTERS / TOPICS FOR PAPER 1 & II WITH WEIGHTAGE OF MARKS FOR UNIVERSITY EXAMINATION IS GIVEN BELOW :

Paper 1 – 100 Marks

1.	General Pharmacology including clinical pharmacology	-	10 marks
2.	Central Nervous System & Local Anasthetics	-	25 marks
3.	Automatic Nervous System including Parkinsonism, Skeletal Muscle Relaxants	-	25 marks
4.	Cardio Vascular System	-	20 marks
5.	Blood and Pharmacotherapy of shock	-	10 marks
6.	Diuretics and Antidiuretics	-	10 marks

Paper – II – 100 Marks

1.	Chemotherapy	-	40 marks
2.	Endocrines (Horones)	-	20 marks
3.	Gastro Intestinal System	-	10 marks
4.	Autocoids	-	10 marks
5.	Respiratory System		
6.	Chelating agents	-	10 marks
7.	Immunosuppressives		
8.	Drugs used in GOUT & Rheumatoid Arthritis		
9.	Vitamins		
10.	Enzymes in Therapy	-	10 marks
11.	Drugs acting on Uterus		
12.	Antiseptic and Disinfectants		

VIVA – VOCE EXAMINATION

Distribution of Marks for Viva Voce Examination
All the four examiners will examine all the candidates.
TOTAL MARKS – 30

1.	General pharmacology, CNS, Local anaestheics, Biogenic amines & polypeptides, Gout & Rheumatoid arthritis	-	8 marks
2.	ANS, Parkinsonism, CVS, Blood & Blood forming Organs Hypolipdedemic agents, Diuretcis	-	7 marks
3.	Endocrines, GIT, Uterus, Respiratory system	-	7 marks
4.	Chemotherapy, Antiseptics and Disinfectants, Chelating agents, Vitamins, Immunopharmacology	-	8 marks

PRACTICAL EXAMINATION
(Distribution of Marks for Practical Examination)

PRACTICAL – 1	**2 HOURS**	**40 MARKS**
Spotters	- 10 marks	
Prescription writing	- 10 marks	
Practical pharmacy exercise	- 20 marks	
	- 40 marks	

PRACTICAL – II	**2 HOURS**	**40 MARKS**
Experimental Pharmacology	- 20 marks	
Interpretation of Graph	- 10 marks	
Clinical Pharmacology Problem	- 10 marks	
	- 40 marks	

Internal Assessment Practical	- 15 marks
Practical record	- 05 marks
	- 20 marks

PHARMACOLOGY PRACTICALS: 144 hours

- PHARMACY : Dosage forms: The students shall be trained to identify, handle and explain the various dosage forms to the patient,
- EXPERIMENTAL PHARMACOLOGY : Demonstration of animal experiments using computer (Virtual Demonstration):
- Effect of drugs on rabbit eye: Mydriatics, miotics and local anesthetics
- Drug action on ciliary movement of frog esophagus
- Induction of catalepsy in rat/mouse
- Skeletal muscle relaxants
- Effect of drugs on spontaneous motor activity and exploratory behavior in mice
- Experimental evaluation of analgesics
- Frog heart preparation demonstrating effects of autonomic drugs
- Effect of autonomic drugs on whole animal preparations

CLINICAL PHARMACOLOGY:

1. Routes of drug administration
2. Clinical problem solving exercises oriented toward drug interactions, rational drug therapy and irrational prescriptions.
3. Prescription writing for common clinical conditions
4. Sources of drug information and information retrieval
5. Rational drug combinations
6. Irrational drug combinations
7. Criticize, correct and rewrite the given wrong prescriptions
8. Critical evaluation of promotional drug literature

9. Communicating to the patient on the proper use of medication
10. Essential drugs list
11. Basic statistical principles used in clinical trials
12. Calculation of drug dosage
13. Ethics in clinical trials

PRACTICAL EXAMINATION : 80 marks

Distribution of marks:

1. Spotters	: 10
2. Prescription writing	: 10
3. Criticize, correct and rewrite	: 10
4. Interpretation of graph	: 10
5. Experimental pharmacology	: 10
6. Dosage forms (2)	: 20
7. Clinical problem	: 10

VIVA-VOCE EXAMINATION : 40 marks

All four examiners will examine all the candidates

Distribution of marks for viva-voce examination

1. General pharmacology, CNS, local anesthetics, biogenic amines, polypeptides, Gout and rheumatoid arthritis. - 10 marks
2. ANS, Parkinsonism, CVS, blood, hypolipidemic drugs and diuretics . - 10 marks
3. Endocrine pharmacology, GIT, oxytocics and tocolytics, and respiratory system . - 10 marks
4. Chemotherapy, antiseptics and disinffectants, chelating. agents, vitamins and immunopharmacology. - 10 marks

FORENSIC MEDICINE AND TOXICOLOGY

A. GOALS AND OBJECTIVES

At the end of he course in the Forensic Medicine, the MBBS student will:

- ✓ Be able to identify, examine and prepare report or certificate in medico legal cases situations in accordance with the law of land.
- ✓ Able to perform medico legal postmortem and interpret autopsy findings and results of other relevant investigations to logically conclude the cause, manner and time since death.
- ✓ Be aware of medical ethics, etiguette, duties, rights, medical negligence and legal responsibilities of the physicians towards patient, progression, society, state and humanity at large.
- ✓ Be aware of relevant legal/court procedures applicable to the medico legal /medical practice.
- ✓ Be able to preserve and dispatch specimens in medico legal / postmortem cases and other concerned materials to the appropriate government agencies for necessary examination.
- ✓ Manage medico legal implications, diagnosis and principles of therapy of common poisons.
- ✓ Be aware of general principles of analytical, environmental, and occupational and preventive aspects of toxicology.

COURSE CONTENTS

THEORY

Must Know

1. History of Forensic Medicine, Definition of forensic medicine and medical jurisprudence, medical ethics.
2. Courts in India and their powers: Supreme Court, High Court, Sessions Court, Additional sessions court, Magistrate's court, Coroner's court.
3. Court procedures: Summons, conduct money, oath, affirmation, perjury, types of witnesses, types of examination, recording evidence, court questions, conduct of doctor in witness box, medical examiner system.
4. Medical certification and medico legal reports including dying declaration
5. **Death:**
   a. Definitions, types: somatic, cellular and brain death.
   b. Natural and unnatural death.
   c. Presumption of death and survivorship.

d. Suspended animation.

6. Changes after death:

a. Cooling of body, Lividity, Rigor mortis, cadaveric spasm, cold stiffening and heat stiffening.
b. Putrefaction, mummification, adipocere and maceration.
c. Estimation of time of death.

7. Inquest by police, magistrate and coroner,

8. Identification.

a. Definition, corpus delicti.
b. Identify of living persons: race, age, sex, religion, complexion, stature.
c. Identification of criminals, unknown persons, dead bodies and remains of a person by: hair fiber, teeth, anthropometry, dactylography, footprints, scars, tattoos, poroscopy, DNA finger printings, Super-imposition.

9. Examination of mutilated human remains; Skeletal remains; and exhumation

10. Medico legal autopsies:

a. Definition of a medico legal post mortem.
b. Difference between pathological and medico legal post mortem.
c. Objectives, procedures, formalities of medico legal autopsies.
d. Obscure autopsy.
e. Special procedures in suspected poisoning.

11. Mechanical injuries and wounds:

a. Definition, classification and differentiation of abrasion, contusion, laceration, incised wounds, Stab wounds.
b. Accidents due to vehicles: injuries of primary and secondary impact, crush syndrome, reconstruction of accidents, railway injuries.
c. Differences between ante mortem and postmortem injuries.
d. Weapons: weapons, dangerous weapons and elementary ballistics.
e. Wounds due to weapons: injuries by dangerous weapons, fire arm wounds, blast injuries, stab wounds, incised wound, defense cuts, hesitation cuts, self inflicted injuries, fabricated wounds.
f. Workmen's compensation act.

12. Examination of an injury case:

a. Differences between accidental, suicidal and homicidal injuries.
b. Types of injuries: simple, grievous and fatal.
c. Wound as a cause of death: primary, secondary.
d. Situation and character of wounds: number, direction, extent and atge of injury.
e. Injuries of various sites.

Head: Scalp wounds, fracture skull, coup, and contra coup injuries.
Intracranial hemorrhage and its location and extent. Injury to brain, spinal cord, spine, eye, thoracic, abdominal, pelvic viscera,
Uterus: pregnant and no pregnant, external genetalia, bones, joints and limbs.

f. Wound certification.

13. Injuries due to physical agents, and their medico legal importance; cold, heat, burns, electricity and lightning.
14. **Asphyxial deaths**: definitions, causes, types, post mortem appearance and medico legal significance of suffocation, drowning, hanging, throttling and strangulation.
15. Death due to malnutrition, neglect, battered babies.
16. **Dowry deaths.**
17. A. Virginity: Definition and signs, Defloration.
    B. Sexual offences: Rape, incest, unnatural offences- Tribadism Bestiality,Buccal coitus.
    C. Sexual perversions: sadism, masochism, transvestism, voyeurism, indecent assault.
18. Legitimacy, paternity, disputed paternity, medico legal significance of impotence, sterility and artificial insemination, superfoetation and super fecundation; atavism; sterilization.
19. **Pregnancy and delivery**: pregnancy- signs of pregnancy in the living and in the dead. Delivery- signs of recent and remote delivery in the living and in the dead; Miscarriage- investigation in deaths due to miscarriage. Medical termination of pregnancy act of 1971.
20. **Infanticide:** Definition and Medico legal consideration: viability; determination of the age of the foetus; method of demonstration of centers of ossification; rule of Haase, signs of live birth; Hydrostatic test. Maceration, post-mortem finding to differentiate still birth from alive birth. Sudden infant death and cot-death, Precipitate labour.
21. **Biological fluids:** examination, preservation, dispatch and identification of blood stains by micro chemical, spectroscopic and precipitation test. Blood groups: Medico legal application; technique of blood grouping. Blood grouping in disputed paternity; group specific substances; hazards of blood transfusion.
22. **Seminal stains**: examination, identification, collection, preservation, dispatch.

Describe to know

1. Brief update on recent advances: HLA typing , DNA typing.

II FORENSIC PSYCHIATRY.

Must Know

1. Definition, types of mental disorders, lucid interval.
2. Indian lunacy act.
3. Diagnosis of ilnsanity and feigned ilnsanity.
4. Testamentary capacity, restraint, insanity with reference to civil and criminal responsibilities, doctrine of diminished responsibility, McNaughten's rule.

III MEDICAL JURISPRUDENCE

1. Indian Medical Councils: their and disciplinary control.
2. Indian Medical Register, rights and privileges of registered medical practitioner, penal crasure, infamous conduct, disciplinary committee.
3. Code and law of medical ethics, unethical practice, dichotomy, consumer protection act.
4. Professional secrets, privileged communication.
5. Malpractice: civil, criminal and ethical.
6. Consent, negligence, vicarious liability, the doctrine of Res Ipsa Loquitur, contributory negligence.
7. Duties of a medical practitioner towards his patient and the society.
8. Human organ Transplantation act of 1994.
9. Sex determination by Amniocentesis.
10. Euthanasia.

IV TOXICOLOGY

Must Know

1. General aspects of poisoning: Duties of doctor in cases of poisoning, medico legal autopsy in poisoning, preservation and dispatch of viscera for chemical analysis. Role of forensic science laboratory. Laws related to poisons.
2. Types of poison, diagnosis, principles of therapy and medico legal aspects of:
   a. Corrosive poisons; strong mineral acids like carbolic acid, oxalic acid, sulphuric acid, nitric acid, hydrochloric acid.
   b. Metallic poisons; Lead, Mercury and Copper.
   c. Animal poisions; Snakes and Scorpions.
   d. Deliriants; Dhatura, Cannabis and Cocaine.
   e. Somniferous agents; Opium, Morphine an Pethidine.
   f. Inebraints; Methyl and ethyl alcohol.
   g. Gaseous poisons; carbon monoxide and carbon dioxide.
   h. Anaesthetic agents; chloroform and ether.
   i. Cardiac poisons; Aconite, Cerebra thevetis and Nerium odalum, Oleander, Hydrocyanic acid.
   j. Miscellaneous; Aspirin, Paracetamol, Barbiturates, diazepum, and antihistaminics.
   k. Insecticides: organophosphorous compound, endrin, kerosene, Turpentine.
   l. Food poisoning: Botulism.

Desirable to know

a. Inorganic non metallic poisons: phosphorous.
b. Metallic poisons: Antimony, nitrites and Arsenic.

c. Organic vegetable irritants:Abrus,Capsicum, Calotropis, Semicarpus, Croton, Ergot and Ricins.
d. Vegetable Alkaloids.
e. Convulsants: strychnine.
f. Paralytic agents.
g. War gases and industrial gases: MIC
h. Sedatives: Chloral hydrate and Bromides.
i. Mechanical poisons.
j. Drug Dependence.

PRACTICALS

1. Demonstration of ten medico legal autopsies.
2. Visit to Court.
3. Age estimation from bones, x-rays, dentition.
4. Injuries and weapons.
5. Examination of intoxicated persons.
6. Possible videotape of examination of victim and accused in sexual offences.
7. Specimens of poisions.

SKILLS

1. Examine & prepare proper certificates in the following medico legal situations:
    a. Injured patient.
    b. Sexual offences.
    c. Determination of age.
    d. Intoxicated patient.
2. Prepare proper certificates of birth and death.
3. Prepare dying declaration.
4. Give evidence in a court of law as an expert witness.
5. Collect and do proper labeling, preservation and dispatch of medico legal specimens.
6. Perform, record finding and issue a report for a medico legal autopsy.
7. Diagnose and manage common acute and chronic poisonings.

PRACTICAL EXERCISES

1. Medico legal autopsies- witnessing and recording (10 cases)
2. Age estimation of an individual by physical, dental and radiological examination.
3. Examination of skeletal remains.
4. Study of a) lethal weapons b) wet specimen/models/photography/ micro slides-like sperms, Diatoms, Hairs, Human and Animal RBCs c) Poisons.
5. Medical certificates /medico legal reports, Physical fitness and sickness and death certificates, injury report, drunkenness, sexual offender.
6. Students should be taken to courts whenever possible to acquaint themselves with the court proceedings.

Note: Practical Exercises conducted shall be entered in the practical record book edited and published by Karnataka Medico Legal Society.

C. TEACHING HOURS

III term -1 hr Theory /week
IV term- 2 hrs Theory & 1 practical / week
V term – 2 hrs Theory & 1 practical / week

The course will be for 18 months in III, IV, V semesters.

D. SCHEME OF EXAMINATION

INTERNAL ASSESSMENT

It shall be based on evaluation of assignment, preparation of seminar, clinical presentation etc. (see Annex-I for examples). Regular periodic examinations should be conducted throughout the course. Although the question of number of examinations is left to the institution, there should be a minimum of at least three session examinations during phase –II of the course and average of best two examination marks should be taken into consideration while calculating the marks of the internal assessment. Day to day records should be given importance in the internal assessment. Proper record of the work should be maintained which will be the basis of all students' internal assessment and souls be available for scrutiny.

Theory

Minimum of three examinations are recommended. The examination preceding the university examination will be similar to the university examination. The total marks would be 20. Average marks of best of two notified internal examinations should be reduced to 20 and should be sent to the university.

Practicals

Internal Assessment examination for practicals and allotment of marks for records will be as follows: The total of 10 marks will be first increased notionally to 50. Out of the 50 marks, 40 will be allotted to terminal practical tests and 10 marks for records. Four practical tests shall be conducted each carrying 10 marks. The marks obtained in the four practical tests and records would be reduced to 10 and sent to the university.

UNIVERSITY EXAMINATION

WRITTEN PAPER

There shall be one theory paper of 100 marks. It shall have 3 types of questions.

1. Long essay	-	02 questions of 10 marks each	20
2. Short essay	-	10 questions of 04 marks each ``	40
3. Short answer	-	20 questions of 02 marks each	40
		Total	100

VIVA-VOCE EXAMINATION

This will carry 20 marks. All the examiners will examine the candidates.

PRACTICAL EXAMINATION

This will carry 40 marks. The distribution of marks for different components is

Age estimation	10 marks
X Rays /Bones	10 marks
Autopsy questions	05 marks
Spotters	10 marks
Medical certificates	05 marks

E. RECOMMENED BOOKS:

1. Dr.K.S.Narayanareddy, The Essentials of Forensic Medicine & Toxicology, 17th edition 1998, pages 515, Rs.170/- , published by K.Suguna Devi.
2. Dr.Apurbanandy, Principles of Forensic Medicine, 1st Edition, reprint 1996, pages 606, Rs.285/-, published by New central book agency.
3. Dr.C.K.Parikh, Parikh's Textbook of Medical Jurisprudence and Toxicology, 5th Edition, Reprinted 1998, Pages 1038, Rs.270/- .
4. P.V.Gugharaj, Forensic Medicine, First Published 1982, Pages 452, Rs. 140, Orient Longman Limited.
5. C.A.Franklin, Modi's Medical, Jurisprudence and Toxicology, 21st edition, pages 352+ 548(900), Rs. 180/-, published by N.M.Tripathi Private Limited, Bombay.
6. Dr.C.R.Parikh, Medico Legal Post Mortem in India , first published 1985, pages 184, Rs. 230/- , published by Medical Publication
7. Keith Simpson, Bernard knight, Forensic Medicine, Ninth Edition, 1985,Pages 348, Price $ 5.95

Specifications mentioned such as edition, number of pages, cost etc, subject to change with newer edition.