THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY, CHENNAI 600032.

M.B.B.S. DEGREE COURSE

SYLLABUS FOR SECOND PROFESSIONAL M.B.B.S.

PATHOLOGY

REVISED (NONSEMESTER) REGULATIONS 2010 - 2011

I. GOALS AND SPECIFIC LEARNING OBJECTIVES

I) GOAL

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

II) SPECIFIC LEARNING OBJECTIVES

a) Knowledge

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

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

b) Skills

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

1. Describe the rationale and principles of technical procedures of the diagnostic laboratory tests
2. Interpretation of the results
3. Perform simple bed-side tests on blood, urine and other biological fluid samples
4. Draw a rational scheme of investigations aimed at diagnosing and managing patients with common disorders
5. Understand biochemical/physiological basis of tests to understand the disturbances that occur as a result of disease in collaboration with pre-clinical departments.
6. Understand the need and methodologies for proper interpersonal relationships between the diagnostic wing and patient care wing of the hospital.
7. Understand the need for quality control in such tests.

c) Integration

At the end of training he/she should be able to integrate the knowledge of

1. Normal tissue morphology,
2. Causes of Disease,
3. Relationship of various causative factors (social, economic and environmental),
4. Tissue changes due to such diseases,
5. Effect of such changes on the patients well being,
6. Easy, Accurate and Low Cost Methods of Diagnosis of such diseases
7. Long term implications of the disease on the patient and community.
8. Natural history of such diseases as prevalent in India, especially in the local region of the Teaching Hospital.

II. TEACHING METHODOLOGY

No	Teaching Method	Detailed Time Distribution	**Minimal Number of Hours to be Dedicated**
1	Didactic Lectures		**110 Hours**
	a. General Pathology	40 Hours	
	b. Systemic Pathology	40 Hours	
	c. Hematology	15 Hours	
	d. Clinical Pathology	15 Hours	
2	Practical Demonstrations		**100 Hours**
	a. General Pathology	20 Hours	
	b. Systemic Pathology	50 Hours	
	c. Hematology	10 Hours	
	d. Clinical Pathology	20 Hours	
3	Integrated Teaching		**40 Hours**
	a. Systemic Pathology	30 Hours	
	b. Hematology	10 Hours	
4	Clinical Interaction & Lab Work		**20 Hours**
	Clinical Pathology	8 Hours	
	Blood Banking	3 Hours	
	Cytology	3 Hours	
	Histopathology	3 Hours	
	Autopsy & Museum	3 Hours	
5	Short Term Student Research		**10 Hours**
6	Internal Assessment Tests		**20 Hours**
	Theory	12 Hours	
	Practicals	6 Hours	
	Communicative Skills Assessment (Viva Voce & OSPE)	2 Hours	
	TOTAL		**300 Hours**

NB:

- Each Lecture class will be of one hour duration only
- Each Practical class will be for 2 hours duration only

III.THEORY SYLLABUS

A. Introduction to Pathology with specific references to
   a. History of Pathology with special mention of pioneers
   b. Evolution of Pathology with special mention of the role of Autopsy in development of Modern pathology and its present day importance.
   c. Role of a Pathologist in a Hospital and importance in diagnosis.

B. Cell injury and Adaptations:
   a. Causes and Mechanism of cell injury and the macroscopic and microscopic features of reversible & irreversible cell injury
   b. Definition and types of necrosis and characteristics of each type of necrosis with examples
   c. Apoptosis - definition, examples, its mechanism, morphological changes and its difference from necrosis
   d. Definition of gangrene - different types with morphology and examples
   e. Adaptations –
      1. Definitions of Hyperplasia, Hypertrophy, Atrophy, Metaplasia, Dysplasia, Hypoplasia with examples.
      2. Differences between - Hypertrophy and Hyperplasia, Atrophy and Hypoplasia
   f. Calcification – Types and Importance
   g. Basics of Cellular Ageing

C. Inflammation & Repair
   a. Acute Inflammation
      i. Definition of acute inflammation and its causes
      ii. Vascular phenomenon of inflammation Cellular phenomenon - chemotaxis, phagocytosis and formation of exudates
      iii. Chemical mediators of inflammation - list, histamine, complement, arachidonic acid metabolites, brief mention of coagulation cascade
      iv. Morphological types of acute inflammation with examples
      v. Clinical & hematological manifestations and outcome of acute inflammation
   b. Chronic inflammation –
      i. Definition, examples, morphology, cells of chronic inflammation with emphasis on epithelioid cells & giant cells
      ii. Granuloma- definition pathogenesis & description of a granuloma with special emphasis on tuberculous granulomaOther types of granuloma - Syphilis, Sarcoidosis and Leprosy
      iii. Giant cells - different types, morphology & examples
   c. Tissue repair, regeneration and fibrosis –
      i. Cell cycle and different types of cells
      ii. Normal cell growth and Regeneration - role of growth factors and extracellular matrix
      iii. Repair - role of collagen, formation and morphology of granulation tissue, angiogenesis and fibrosis
      iv. Wound healing - first and second intention
      v. Factors affecting wound healing
      vi. Complications of wound healing
      vii. Healing in bone and specialized tissue
      viii. Disorders of Growth - Mechanisms of Causation - Hyperplasia, Hypertrophy, Atrophy, Metaplasia, Dysplasia, Hypoplasia.

D. Hemodynamic disorders, thrombosis and shock
   a. Hyperemia and congestion - definition and morphology
   b. Normal hemostasis - mechanism and pathways

c. Thrombosis - definition, pathogenesis, causes, morphology and fate - Differences between Thrombophlebitis and Phlebothrombosis - Differences between Antemortem Thrombus and Postmortem Clot,
d. Embolism & Infarction: definition, types, pathogenesis with examples
e. Oedema - definition, types, pathogenesis with examples
f. Differences between Transudate and Exudate
g. Shock: definition, types, pathogenesis, clinical manifestations and examples

E. Neoplasia

a. Definition (Willis'), Classification and Nomenclature
b. Characteristics of a malignant neoplasm
c. Differences between - Benign and Malignant neoplasm, Carcinoma and Sarcoma
d. Spread of a malignant tumor - Routes with example, Mechanisms of spread
e. Metastasis – Definition, Mechanisms and Significance
f. Carcinogenesis - what is a carcinogen? Why carcinogenesis is a genetic event? Different types of carcinogens and their mechanism of action – Physical, Chemical & Biological Carcinogenesis.
g. Molecular biology and genetics of carcinogenesis
h. Immunology of Tumors
i. Systemic changes due to neoplasia - paraneoplastic syndrome
j. Clinical Features of Neoplasia
k. Diagnosis of Neoplasia

F. Genetics and chromosomal disorders –

a. DNA structure,
b. Mutations - definition, types, pathogenesis with examples
c. Mendelian disorders - definition, types, pathogenesis with examples
d. Chromosomal structural alterations, karyotypic and cytogenetic disorders - definition, types, pathogenesis with examples
e. Diagnosis of genetic diseases – Specific references to PCR, FISH, Recombinant DNA Technology and Human Genome Project

G. Immune diseases

a. Hypersensitivity reactions,
b. Graft rejection
c. Autoimmune disorders - mechanism, SLE, Rheumatoid arthritis
d. Immunodeficiency Disorders – Classification & Etipathogenesis
e. An Overview of AIDS - pathophysiology, clinical manifestations, diagnosis,
f. An Overview of Amyloidosis - pathophysiology, clinical manifestations, diagnosis

H. Environmental pathology –– definition, types, pathogenesis with examples with specific reference to Tobacco, Alcohol, Pneumoconiosis and Radiation

I. Infectious diseases:

a. General Host Factors, Immunology, Toxicity of Organisms
b. Mycobacterial diseases: tuberculosis and leprosy
c. Bacterial diseases: pyogenic, typhoid, diptheria, gram -ve infections, bacillary dysentery, syphilis
d. Viral*:* polio, herpes, rabies, measles, rickettsial, chlamydial infections
e. Fungal disease and opportunistic infections
f. Parasitic diseases: malaria, filaria, amoebiasis, kala azar, cystecercosis, hydatid
g. AIDS: etiology, modes of transmission, pathogenesis, pathology, complications, diagnostic procedures and handling of infected materials and health education
h. Prions Diseases – Classification, pathobiology, clinical manifestations, diagnosis

J. Nutritional Disorders

a. Protein Energy Malnutrition – Marasmus, Kwashiorkar
b. Vitamin Deficiency Disorders
c. Obesity
d. Rare Metal Deficiencies

K. Metabolic disorders

a. Jaundice - definition, bilirubin metabolism, classification, lab. Diagnosis,
b. Diabetes Mellitus - Definition, Classification, Physiology of insulin metabolism, Pathophysiology, Complications, Diagnosis
c. Gout - definition, classification, pathophysiology, diagnosis
d. Storage disorders
    i. Classification of storage diseases
    ii. Familial hypercholesterolemia,
    iii. Lysosomal & Glycogen storage Disorders

L. Hematology:

a. Physiology of Normal Marrow, Ferrokinetics and Erythropoeisis,
b. Red Cell disorders -
    i. Definition,
    ii. Classification of anemia - Morphological & Etiological
    iii. Iron deficiency anemia - causes, pathogenesis, clinical manifestations and lab diagnosis
    iv. Megaloblastic anemia - causes, pathogenesis, clinical manifestations and lab diagnosis
    v. Aplastic anemia - causes, pathogenesis, clinical manifestations and lab diagnosis
    vi. Hemolytic anemia - causes, pathogenesis, clinical manifestations and lab diagnosis including childhood, inherited, immune and microangiopathic hemolytic disorders
    vii. Thalassemia- types, pathogenesis, genetics, clinical features, lab diagnosis
    viii. Structural hemoglobinopathies - Sickle cell disease, G6PD deficiency
    ix. Other red cell disorders – polycythemia
c. Leucocyte disorders –
    i. Definition,
    ii. Classification of Leukemia(FAB & WHO)
    iii. Acute leukemia - causes, morphology, lab diagnosis
    iv. Chronic leukemia - causes, morphology, lab diagnosis
    v. Leukemoid reaction - types, morphology, differentiation from leukemia, lab diagnosis
    vi. Myelodysplastic syndrome - definition, classification and morphology, lab diagnosis
    vii. Benign disorders - leucocytosis, leucopenia etc. lab diagnosis
d. Bleeding disorders –
    i. Thrombocytopenia - causes, common types, approach for lab diagnosis
    ii. ITP - causes, types, lab diagnosis
    iii. Coagulation disorders - causes, approach for lab diagnosis
    iv. Hemophilia - cause, types, lab diagnosis
    v. DIC - causes, pathogenesis, features and lab diagnosis
e. Other hematological diseases
    i. Plasma cell disorders Hematological manifestations of some important diseases and lab diagnosis
f. Blood groups and Blood Transfusion
    i. Different blood groups and their Clinical significance
    ii. Determination of blood groups
    iii. Significance of reverse grouping and cross-matching
    iv. Blood donation - collection, preservation, tests performed
    v. Indications of Blood Transfusion
    vi. Transfusion reactions – diagnosis
    vii. Rational use of blood - including component therapy

M. Cardiovascular Pathology

a. Atherosclerosis:-Definition, risk factors, etiopathogenesis, gross and microscopic description, complications and clinical correlation.

b. Diseases of blood vessels: Hypertension:- Relate the mechanisms of the disease to the clinical course and sequelae. Develop an index of suspicion for vasculitides and aneurysms – overview of classification and morphology of vasculitides and aneurysms.
c. Ischaemic heart disease:- Incidence, risk factors, Pathogenesis, morphological changes, clinical course, complications and investigations.
d. Congenital heart disease:- Correlate the anatomical malformations of disorders to the clinical consequences of the disease.
e. Rheumatic heart disease:- Incidence, etiopathogenesis, morbid anatomy, histopathology, lesions in the organs, clinical course and sequelae.
f. Endocardial and pericardial diseases:- Infective endocarditis - Pathogenesis, morphology, differential diagnosis of cardiac vegetations, aetiology and basic morphology of different forms of pericarditis.
g. Cardiomyopathies:- Recognize the disorders as part of differential diagnosis in primary myocardial diseases.
h. Pericardial Diseases – Pericarditis
i. Tumours of Heart – Classification & Morphology

N. Respiratory Pathology

a. Structure of bronchial tree and alveolar walls, normal and altered.
b. Inflammatory diseases of bronchi: chronic bronchitis, bronchiectasis Pneumonias:- Aetiology, classification, gross, histopathological description in different forms and complications.
c. Lung Abscess and Bronchiectasis:- Etiopathogenesis, morphological appearances and complications.
d. Chronic Bronchitis and Emphysema:- Pathogenesis, types of emphysema, definition of chronic bronchitis, morbid anatomy and cardiac sequelae.
e. Occupational lung diseases:- Types, etiopathogenesis, gross anatomical differences between different forms and sequelae.
f. Interstitial Lung Diseases:- Classification, Etiopathogenesis, morphological appearances and complications
g. Pulmonary Vascular Disorders:- Classifiaction, Etiopathogenesis, morphological appearances and complications
h. Tumours of lung and pleura:- Classification, aetiology, gross appearances, histological description of important forms, natural history, pattern of spread,
i. Para neoplastic syndromes and secondary pathology.

O. Gastro Intestinal Pathology:

a. Lesions of oral cavity and salivary glands:- Differential diagnosis of swelling of salivary glands, oral cancer - etiopathogenesis, gross and histopathological descriptions.
b. Pathology of Oesophagus: Barretts esophagus, Etiopathogenesis, morphological features of carcinoma oesophagus.
c. Pathology of Stomach: Gastritis and Peptic Ulcer - Definition of peptic ulcer, etiological factors, gross and microscopic appearances and sequelae. Overview of aetiology and types of gastritis. Tumours: Classification and morbid anatomy and histopathology of gastric carcinomas; Lymphomas - etiological factors, gross and microscopic appearances
d. Pathology of Intestine:
    i. Malabsorption Syndrome, Ulcers of Intestines:- Etiological classifications, Morphological appearances of typhoid, tubercular, amoebic ulcers and bacillary dysentery. Differential diagnosis of different forms of ulcers.
    ii. Idiopathic Inflammatory Bowel disease:- Enumerate similarities and differences between the two component disorders viz., Crohn's disease and ulcerative colitis.
    iii. Tumours of upper GIT:- Overview of carcinoid tumours of GIT. Tumours of lower GIT:- Pathology of carcinoma colon. Intestinal polyps & GI stromal tumours. GI Lymphomas – Classification, etiological factors, gross and microscopic appearances
e. Pathology of Liver: Viral Hepatitis:- Aetiology, clinical source and enzymology, salient histological features and sequelae. Alcoholic liver disease:- Pathogenesis, morphological manifestations and

correlation with clinical features. Cirrhosis:- Classification, Etiopathogenesis, Morphology and Differential diagnosis. Tumours of liver, Etiopathogenesis and Pathology of Hepatocellular carcinoma.

f. Pathology of Pancreas and gall bladder:-.
    i. Pancreatitis – etiopathogenesis and Pathology; Tumours of Pancreas and gall bladder - etiopathogenesis and Pathology; Diabetes mellitus:- Classification, pathogenesis of system involvement, sequelae and complications.
    ii. Gall Bladder – Cholecystitis – Clinical features and morphology; Gall stones – Classification and etiopathogenesis

P. Diseases of Kidney:

a. Acute nephritis and rapidly progressive GN:- Understand and integrate clinical and pathologic features of these syndromes.
b. Nephrotic syndrome:- Integrate clinical and pathological features of this disorder.
c. Special Causes of Renal Diseases – SLE, Amyloidosis, Diabetes Melitus, Hypertension, Hypercalcemia & Hyperparathyroidism,
d. Renal failure:- Definitions, criteria, aetiology, systemic manifestations and investigations. Etiopathogenesis & Morphology of Acute Tubular Necrosis, Acute and Chronic Renal Failure, Acute and Chronic Glomerulonephritis.
e. Obstructive Uropathy: Etiopathogenesis & Morphological Changes
f. Renal Stones: Etiopathogenesis & Morphology
g. Pyelonephritis and interstitial Nephritis:- Aetiology, Pathogenesis of Pyelonephritis acute and chronic morphological features and clinical correlation.
h. Acute Papillary Necrosis: Etiopathogenesis & Morphology
i. Tumours of kidney and Pelvis:- Classification, Morphological features, clinical course including Para neoplastic syndromes of common tumours.

Q. Pathology of Male Genital Tract:

a. Benign Adenomyomatous Hyperplasia of Prostate: Etiopathogenesis & Morphology
b. Tumours of testis and Prostate:- Classification, salient morphological features of most common tumours and clinical course.
c. Pathology of Intertility

R. Pathology of Female Genital Tract:

a. Adenomyosis and Endometriosis: Etiopathogenesis & Morphology
b. Female Infertility: Etiopathogenesis & Morphology
c. Disorders of Endometrial Morphology and Menstrual Cycle - Etiopathogenesis & Morphology
d. Tumours of Cervix and Uterus:- Etiopathogenesis, salient morphological features, dysplasia and role of cytological screening.
e. Tumours of Ovary and Trophoblastic tissue:- Classification and morphological description of important types.

S. Pathology of Breast:

a. Non-neoplastic and Neoplastic lesions of the breast:- Classification, morphological features and grading of carcinoma breast and differential diagnosis of breast swellings. Prognostic factors in Breast Cancers

T. Pathology of Lymphoreticular System:

a. Non-neoplastic lesions of lymph nodes and Spleen:- Aetiology, differential diagnosis, morphological features of common causes of lymphadenopathy, common causes and appearances of splenomegaly.
b. Hodgkin's Lymphoma:- Definition, classification, salient diagnostic features and clinical course.
c. Non-Hodgkin's Lymphoma:- Definition, classification, salient diagnostic features and clinical Correlation.
d. Extra nodal lymphomas.

U. Pathology of Skin and Soft Tissue –

a. Bullous Lesions of Skin: Classification and morphological features

b. Pigmented Lesions of Skin: Classification and morphological features
c. Maculopapullar Lesions of Skin: Classification and morphological features with specific reference to Psoriasis, Lichen Planus
d. Precancerous Lesions of Skin: Classification and morphological features
e. Tumours of skin Non-pigmented:- Classification, morphological features of most common types and natural history.
f. Tumours of skin - Pigmented:- Classification, morphological features of common naevi, natural history of malignant melanoma.
g. Soft tissue tumours:- Classification, morphological features of lipomatous, fibrous and blood vessel tumours. Morphological features of neural, muscle and fibrohistiocytic tumours.

V. Bone & Joints

a. Non-neoplastic lesions of bone and joints:- Etiopathogenesis and morphological changes of common arthritis and osteomyelitis.
b. Metabolism of Calcium and Bone: Disorders of Metabolism, Classification and morphological features.
c. Tumour Like Lesions of Bone: Fibrous Dysplasia and Pagets Disease – Etiopathogenesis and morphological features
d. Tumours of bone, cartilage and joints:- Classification, radiological and pathological features of important bone tumours (Osteosarcoma, Osteochondroma, GCT and Ewing's sarcoma).

W. Central Nervous System, Peripheral Nervous System & Muscle:

a. Inflammatory and neoplastic conditions of CNS:- Etiopathogeneisis, Pathobiology, Morphological features and differential diagnosis of meningitis. Etiopathogeneisis, Pathobiology, Morphological features and differential diagnosis of Encephalitis.
b. Role of CSF in diagnosis of CNS diseases
c. Classification, morphological features of important CNS tumours, clinical course and sequelae (Meningioma and Gliomas).
d. Myopathies:- Differential diagnosis of common muscle disorders.

X. Endocrinology

a. Lesions of Thyroid:- Differential diagnosis of thyroid nodule. Differential diagnosis of diffuse thyroid enlargements, Differential diagnosis of Thyroid function abnormalities – hypo and hyper thyroidism, Thyroiditis – etiopathogenesis, pathology, classification and complications, Thyroid Tumours – Classification, etiopathogenesis, pathology, diagnosis and prognosis.
b. Lesions of Adrenal:- Differential diagnosis of adrenal nodule. Differential diagnosis of diffuse adrenal enlargements, Differential diagnosis of adrenal function abnormalities cortical/ medullary – Hyper/Hypo functioning, Adrenalitis – etiopathogenesis, pathology, classification and complications, Adrenal Tumours – Classification, etiopathogenesis, pathology and diagnosis with specific reference to Phaeochromocytoma.
c. Lesions of Pituitary :- Differential diagnosis of pituitary function abnormalities – hypo and hyper, Pituitary Tumours – Classification, etiopathogenesis, pathology, diagnosis and prognosis. Multiple Endocrine Neoplasia - Classification, etiopathogenesis, pathology, diagnosis

Y. Perinatal and Pediatric Pathology

a. Developmental Disorders:- Differential diagnosis of IUGR / Small for Gestational Age Foetus; Differential diagnosis of Still Birth, Differential diagnosis of Neonatal Death, Differential diagnosis of Neonatal Jaundice, Differential diagnosis of Sudden Infant Death / SIDS; Differential diagnosis of Neonatal Septicemia, Differential diagnosis of Neonatal Anemia, Differential diagnosis of Neonatal Convulsions.
b. Hyaline Membrane Disease – etiopathogenesis, pathology and complications.
c. Cystic Fibrosis – Etiopathogenesis, pathology, diagnosis and prognosis.
d. Hemolytic Disease of New Born: Etiopathogenesis, pathology, and complications
e. Pediatric Tumours – Classification, etiopathogenesis, pathology and diagnosis with specific reference to Wilms Tumour, Neuroblastoma, Retinoblastoma, Embryonal Rhabdomyosarcoma and Ewings Sarcoma.

f. Lesions of Pituitary :- Differential diagnosis of pituitary function abnormalities – hypo and hyper, Pituitary Tumours – Classification, etiopathogenesis, pathology, diagnosis and prognosis. Multiple Endocrine Neoplasia - Classification, etiopathogenesis, pathology, diagnosis

Z. Developments in Pathology: Recent Trends in Pathology with specific reference to

a. Immunocyto/histochemistry
b. Immunoflourescence
c. Flowcytometry
d. Image Analysis & Digital Morphometry
e. DNA Microarray Technology and Laser MicroDissection
f. Computers and Automation, Telepathology & Virtual Pathology

IV. PRACTICAL SYLLABUS

The Clinical Pathology Teaching is to be done as [a] Bed Side and Hospital Lab based demonstrations and evaluation sessions. [b] Departmental practical classes of 2 hours duration each. The Clinical Pathology classes shall be drawn from the time allotted in the first clinical year – clinical posting schedules.

The procedures to be demonstrated and practiced are:-

A] Clinical Pathology – Blood

1. Anticoagulants and their use - practice
2. Drawing of blood, Preparation of Smears and Staining od Smears – practice
3. Using the microscope - practice
4. Differential Leucocyte Count of Blood Smears– practice
5. Reporting of Peripheral Smear - practice
6. Hemoglobin estimation by acid hematin method – practice
7. Blood grouping – ABO & Rh – practice
8. ESR by Westergreen pipette – demonstration
9. Total count of WBC, RBC and Platalets by Neubauer chamber – demonstration
10. Hemoglobin estimation by Drabkin's method – demonstration
11. PCV by Wintrobe's tube – demonstration
12. Bleeding time, Clotting time, Prothrombin time, APTT – demonstration
13. Osmotic Fragitility Test, Coombs Tests and Sickle Test - demonstration
14. Use of Automated Cell Counters and Coagulations Analysers - demonstration
15. Reporting Peripheral Blood and Bone marrow – typical stained slides to be provided **(List Appended - *Table2A)***

B] Clinical Pathology – Urine and Body Fluids

1. Urine – assessment of the physical characters, To measure specific gravity and pH– practice
2. Urine – chemical tests for Protein, Reducing substances, blood, bile salts, bile pigments and Ketone bodies- practice
3. Use of different stix and their interpretation - demonstration
4. Microscopic examination of urine – practice
5. Automated Urine Analysis - demonstration
6. CSF – demonstration of cell type in a normal CSF sample and a case of pyogenic meningitis Preservation and Preparation of smears
7. Ascitic and Pleural Fluids - demonstration of cell types, Preservation and Preparation of smears
8. Semen Analysis - demonstration of cell types, Preservation and Procedures

C] Histopathology & Cytopathology

1. Preservation and Transport of Specimens - demonstration
2. Laboratory Techniques in Histopathology - demonstration
3. Laboratory Techniques in Cytopathology - FNAC, Pap Smears, Fluid Cytology– demonstration
4. H & E staining and other special staining – demonstration
5. Demonstration of Histopathology slides – along with tutorial classes in systemic pathology– typical stained slides to be provided **(List Appended -*Table 1)***
6. Demonstration of Cytology slides – along with tutorial classes in systemic pathology – typical stained slides to be provided **(List Appended -*Table 2A)***
7. Demonstration of Gross Specimens – along with tutorial classes in systemic pathology – typical specimens to be provided **(List Appended - *Table 2B)***

List of Slides and Specimens for Histopathology, Cytology, hematology and Gross Specimens have been appended herewith. The list is only a guideline of the minimal requirements.

Table 1 HISTOPATHOLOGY SLIDES

NO	DIAGNOSIS	NO	DIAGNOSIS
1	FATTY CHANGE LIVER	30	AMOEBIC COLITIS
2	LEIOMYOMA WITH HYALINE DEGENERATION	31	ILEUM - TYPHOID ULCER
3	KIDNEY – AMYLOID	32	STOMACH - CHRONIC PEPTIC ULCER
4	LYMPH NODE - CASEOUS NECROSIS	33	LIVER – HCC
5	KIDNEY - INFARCT (COAGULATION NECROSIS)	34	LIVER- CIRRHOSIS
6	ACUTE ULCERATIVE APPENDICITIS	35	CRESCENTIC GLOMERULONEPHRITIS
7	PYOGENIC MENINGITIS	36	CHRONIC GLOMERULONEPHRITIS
8	LEPROMATOUS LEPROSY – SKIN	37	KIDNEY - CHRONIC PYELONEPHRITIS
9	TUBERCULOID LEPROSY – SKIN	38	KIDNEY - RCC
10	ACTINOMYCOSIS ABSCESS	39	KIDNEY – WILMS TUMOUR
11	GRANULATION TISSUE	40	UTERUS - LEIOMYOMA
12	TUBERCULOUS LYMPHADENITIS	41	UTERUS – ADENOMYOSIS
13	LUNG – CVC	42	BENIGN PROSTATIC HYPERPLASIA
14	LIVER - CVC	43	TESTIS – SEMINOMA
15	SPLEEN –CVC	44	PRODUCTS OF CONCEPTION
16	ARTERY – RECENT / ORGANISED THROMBUS	45	HODGKIN'S LYMPHOMA
17	SKIN - PAPILLOMA	46	BRAIN - MENINGIOMA
18	SQUAMOUS CELL CARCINOMA	47	BONE - OSTEOGENIC SARCOMA
19	ADENOCARCINOMA - COLON	48	BONE - CHONDROMA
20	LYMPH NODE – METASTASIS	49	BONE – OSTEOCLASTOMA
21	SKIN – CAPILLARY HAEMANGIOMA	50	SKIN - MELANOMA AND NEVUS
22	CAVERNOUS HAEMANGIOMA	51	BREAST – FIBROADENOMA
23	BENIGN CYSTIC TERATOMA (DERMOID CYST)	52	BREAST - CARCINOMA
24	HASHIMOTO'S THYROIDITIS	53	THYROID - COLLOID GOITRE
25	HEART - RHEUMATIC MYOCARDITIS	54	THYROID - PAPILLARY CARCINOMA
26	HEART - HEALED INFARCT	55	SKIN - BASAL CELL CARCINOMA
27	AORTA – ATHEROSCLEROSIS	56	SOFT TISSUE - SCHWANNOMA
28	LUNG – BRONCHIECTASIS	57	SOFT TISSUE – NEUROFIBROMA
29	LUNG - FIBROCASEOUS TUBERCULOSIS	58	SOFT TISSUE - LIPOSARCOMA

Table 2A: HEMATOLOGY & CYTOLOGY SLIDES

NO	DIAGNOSIS	NO	DIAGNOSIS
1	ACUTE MYELOBLASTIC LEUKAEMIA (AML)	12	FNAC BREAST - FIBROADENOMA
2	ACUTE LYMPHOBLASTIC LEUKEMIA (ALL)	13	FNAC BREAST – DUCTAL CARCINOMA
3	CHRONIC MYELOID LEUKEMIA (CML – CHRONIC PHASE)		FNAC LYMPHNODE – GRANULOMATOUS LYMPHADENITIS
4	CHRONIC LYMPHOCYTIC LEUKEMIA (CLL)	14	FNAC LYMPHNODE –METASTATIC DEPOSIT
5	NEUTROPHILLIA	15	FNAC THYROID – COLLOID GOITRE
6	EOSINOPHILIA	16	FNAC THYROID – PAPILLARY CARCINOMA
7	LYMPHOCYTOSIS	17	FNAC SOFT TISSUE – LIPOMATOUS LESION
8	IRON DEFICIENCY ANAEMIA	18	ASCITIC FLUID – POSITIVE FOR MALIGNANCY - ADENOCARCINOMA
9	MACROCYTIC ANAEMIA	19	PAP SMEAR – PREGNANCY SMEAR
10	SMEAR WITH MICROFILARIA/PLASMODIUM	20	PAP SMEAR – ESTROGENIC SMEAR
11	PLASMA CELL MYELOMA - MARROW	21	PAP SMEAR – ATROPHIC SMEAR

Table 2B: GROSS SPECIMENS

DIAGNOSIS	DIAGNOSIS	DIAGNOSIS
GP: AMYLOIDOSIS KIDNEY/ SPLEEN	GIT: AMOEBIC COLITIS	CARCINOMA LARYNX
GP: INFARCT KIDNEY	GIT: POLYPS	MAXILLARYTUMOURS
GP: FATTY CHANGE LIVER	GIT: ADENOCARCINOMA – COLON	MANDIBULAR TUMOURS
GP: DRY GANGRENE FOOT	GIT: ILEUM - TYPHOID ULCER	THYROID – ADENOMA
GP: WET GANGRENE	GIT: AMOEBIC LIVER ABSCESS	HASHIMOTO'S THYROIDITIS
GP: INFARCT SPLEEN / INTESTINE	GIT: LIVER ACUTE DIFFUSE NECROSIS	MULTINODULAR GOITRE
GP: CASEAOUS NECROSIS	GIT: CIRRHOSIS	PAPILLARY CARCINOMA
GP: CHRONIC INFLAMMATION	GIT: HEPATOMA	MEDULLARY CARCINOMA
GP: ACUTE APPENDICITIS	GIT: LIVER METASTASIS	BONE: OSTEOGENIC SARCOMA
GP: ABSCESS KIDNEY / LIVER	GIT: INTESTINE GANGRENE	BONE: EWINGS SARCOMA
GP: MYCETOMA - FOOT	GIT: OESOPHAGUS CARCINOMA	BONE: CHRONIC OSTEOMYELITIS
GP: LIVER – CVC	GIT: CHRONIC GASTRIC ULCER	BONE: OSTEOCLASTOMA
CVS: AORTA – ATHEROMA	GIT: STOMACH – CARCINOMA	CNS: ABSCESS
CVS: ATHEROMA & CALCIFICATION	GIT: INTESTINE - ULCER	CNS: MENINGIOMA / GLIOMA
CVS: THROMBUS - ARTERY / VEIN	GIT: STRICTURE INTESTINE	CNS: HAEMORRHAGE / CVA
CVS: RHEUMATIC CARDITIS	GUT: WILM'S TUMOUR	L/RET: TB LYMPHADENITIS
CVS: VENTRICULAR HYPERTROPHY	GUT: CARCINOMA - URINARY BLADDER	L/RET: LYMPHOMA
CVS: PERICARDITIS	GUT: SCC - PENIS	L/RET: SPLEEN - INFARCT
CVS: MITRAL STENOSIS	GUT: SEMINOMA - TESTIS	SKIN – MALIGNANT MELANOMA
CVS: AORTIC STENOSIS	GUT: TERATOMA TESTIS	SST: PAPILLOMA SKIN
CVS: BACTERIAL ENDOCARDITIS	GUT: BENIGN PROSTATIC HYPERTROPHY	SST: SQUAMOUS CELL CA
CVS: SYPHILITIC AORTITIS	GUT: POST PARTUM UTERUS	SST: BASAL CELL CA
CVS: HEART - HEALED INFARCT	GUT: UTERUS- LEIOMYOMA	SST: LIPOMA
RS: LUNG - MILIARY TB	GUT: ADENOMYOSIS	BREAST – FIBROCYSTIC DISEASE
RS: FIBROCASEOUS TB	GUT: ENDOMETRIAL POLYP	BREAST - FIBROADENOMA
RS: LOBAR / BRONCHOPNEUMONIA	GUT: CERVICAL POLYP	BREAST – DUCTAL CARCINOMA
RS: BRONCHOGENIC CARCINOMA	GUT: CARCINOMA CERVIX	BREAST – MEDULLARY CA
RS: LUNG – ABSCESS	GUT: CYSTADENOCARCINOMA OVARY	BREAST – PHYLLODES TUMOUR
RS: FIBROCASEOUS TB	GUT: TERATOMA OVARY	
RS: LUNG - CVC	GUT: ACUTE PYELONEPHRITIS	
RS: METASTASIS - LUNG	GUT: SHRUNKEN GRANULAR KIDNEY	
	GUT: FLEA BITTEN KIDNEY	
	GUT: KIDNEY STONES	
	GUT: RENAL CELL CARCINOMA KIDNEY	

V. REFERENCED LEARNING

Text Books:

a) Robbins Pathological Basis of Disease – Kumar, Abbas & Fausto VIII Ed

b) Text book of Pathology by Harsh Mohan

c) Degruchi's Text Book of Haematology

Reference Books:

a) Anderson's text book of Pathology Vol I & II

b) Oxford text book of Pathology Vol. I, II & III

c) Pathology by Rubin and Farber

VI. PRACTICAL EXAMINATIONS

II MBBS UNIVERSITY PRACTICAL EXAMINATIONS IN PATHOLOGY PATTERN AS COMMUNICATED BY THE UNIVERSITY VIDE REFERENCE:ACAD-1(1)/10763/2010 DATED 3.9.2010				
No	**Name of Test Session**	**No of Cases**	**Time**	**MAX Marks**
I	**CLINICAL INTERPRETATION SKILLS** A detailed clinical history with lab reports of histopathology, cytology, hematology and / or autopsy to given and discussed.	2	40 mts	20
II	**SPOTTERS**: 10 cases (6 Histopathology slides, 4 specimens) will be given with a pertinent question regarding the case to answer	10	20 mts	20
III	**HISTOPATHOLOGY & CYTOLOGY**: 6cases (3 Histopathology + 3 Cytology Slides) detailed history should be given and student asked to write a description and diagnosis.	6	30 mts	12
IV	**HEMATOLOGY**: 4 Slides & detailed history should be given and student asked to write a description and diagnosis	4	20mts	8
V	**GROSSING OF SPECIMENS**: 5 cases and detailed history should be given and student asked to write a description and impression	5	10 mts	10
VI	**CLINICAL PATHOLOGY—URINE**: A sample of urine and a brief history should be given and student asked to note the physical and find one abnormal chemical constituent and discuss.	1	30 mts	10
VII	**CLINICAL PATHOLOGY—BLOOD**: A sample of blood and smear study with a brief history should be given and student asked to do a DC and Hemoglobin Estimation and discuss.	2	30 mts	20

VI. VIVA & OSPE EXAMINATIONS

No	Session	Time per station	Marks
1	Viva Voce – 2 stations of 1 Internal & 1 External examiner of 25 marks each	5mts	50marks
2	OSPE – 2 stations of 1 Internal & 1 External with 5 skills each	5mts	50marks