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2) PATHOLOGY:

(i) GOAL:

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

(ii) OBJECTIVES:

(a) KNOWLEDGE:

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

(1) 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.

(2) Explain the pathophysiological processes which govern the maintenance of nomeos-as, mechanisms of their disturbance and the morphological and curricual manifestations associated with it;

(3) Describe the mechanisms and patterns to tissue response to injury such that he/she can appreciate the pathophysiology of disease process and their curricular manfestations;

(4) Correlate normal and altered morphology (gross and microscopic) of different organ systems in common disease to the extent needed for understanding of disease processes and their clinical significance.

(b) SKILLS:

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

(1) Describe the rationale and principles of technical procedures of the diagnostic laboratory tests and interpretation of the results.

(2) Perform the simple bed-side tests on blood, urine and other biological fluid sample.

(3) Draw a rational scheme of investigations aimed and diagnosing and managing the cases of common disorders;

(4) Understand biochemical/physiological disturbances that occur as a result of disease in collaboration with pre-clinical department.

(c) INTEGRATION:

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

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PATHOLOGY SYLLABUS

i) Theory

Sl. No.	Name of the Unit	No. of Hours
GENERAL PATHOLOGY:		
1.	Cellular injury & Cellular death	3
2.	Cellular growth & differentiation normal regulation and adaptation	3
3.	Inflammation & Repair	5
4.	Haemodynamic disorders, Thrombosis & shock	5
5.	Genetic Disorders: Sex Chromatin, Turner's, Klinefelter's, Down's	3
6.	Diseases of Immunity including: a) S. L. E. b) Amyloidosis	4
7.	Neoplasia	6
8.	Infectious diseases a) Tuberculosis b) Leprosy – Integrated teaching c) Syphilis d) Typhoid e) Amoebiasis f) Rhino Sporidiosis g) Madura Micosis h) Aids – Integrated teaching	5
9.	Vitamins and Nutritional Disorders	
HAEMOTOLOGY:		
1.	Anemias	3
2.	Bleeding disorders	2
3.	Leukemias	2
4.	Plasma cell disorders	1
5.	Lymhnodes and spleen	3
SYSTEMIC PATHOLOGY:		
	DISORDERS OF THE BLOOD VESSELS a) Atherosclerosis b) Aneurysms C) Tumors d) Hypertension – Integrated teaching	4
	CVS 1. Pericardial diseases 2. Ischaemic heart diseases 3. Rheumatic heart disease – Integrated teaching 4. Infective endocarditi 5. Myocardial diseases 6. Congenital heart diseases	4

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RESPIRATORY DISEASES 7

1. COPD
2. Pulmonary infections and Lung abscess
3. Pneumoconiosis
4. ARDS (Adult Respiratory Distress Syndrome)
5. Tumors
6. Diseases of the Pleura

DISEASES OF THE G.I.T 11

1. Salivary Gland diseases
   a) Tumors b) Inflammatory conditions
2. Disease of the oral cavity and Esophagus
3. Stomach
   a) Gastritis b) Peptic Ulcers – Integrated teaching
   c) Tumors integrated teaching
4. Intestines
   a) I.B.D b) Mal absorption syndromes c) Tumors

DISEASES OF THE LIVER AND BILIARY TACT 5

1. Cirrhosis
2. Hepatitis – Integrated teaching
3. Tumors of Liver
4. Tumors of Gall bladder
5. Inflammatory diseases of Gall bladder
6. Gall stones

DISEASES OF PANCREAS 3

1. Pancreatitis 2. Tumors
3. Diabetes Mellitus – Integrated teaching

KIDNEY & LOWER UNIVARY TRACT 7

1. Cystic conditions of Kidney
2. Glomerular diseases
3. Tubular diseases
4. Nephrotic Syndrome – Integrated teaching
5. Pyelonephritis
6. Renal stones
7. Tumors of the Kidney
8. Inflammatory conditions and tumors of the bladder

MALE GENITAL TRACT 3

Inflammatory conditions & Neoplastic lesions involving Penis, Testis & Prostate

FEMALE GENITAL TRACT 5

1. Cervicitis
2. Carcinoma cervix – Integrated teaching
3. Dysfunctional uterine bleeding
4. Ovarian tumors
5. Trophoblastic tumors

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DISEASES OF THE BREAST 3
Inflammatory conditions & Neoplasms

ENDOCRINE DISORDERS 6
1. Thyroid disorder
   a) Hyper Thyroid b)Thyroiditis c)Goiters d) Tumors
2. Para-thyroid disorder
3. Pituitary gland disorders
4. Adrenal glands disorders
   a) Disorders of hypertension b)Tumors and infections

DISORDERS OF THE SKIN 1

DISORDERS OF THE BONES, JOINTS & MUSCLES 4

DISORDERS OF THE CENTRAL & PERIPHERAL NERVOUS SYSTEM
a) Inflammatory b) neoplastic lesions 5

ii) TOPICS FOR INTEGRATED TEACHING:

1. Hypertention
2. Myocardial infarction
3. Peptic Ulcer
4. Diabetic mellitus
5. Nephrotic syndrome
6. Carcinoma cervix
7. Carcinoma stomach
8. Leprosy
9. Hepatitis
10. AIDS

iii) DIVISION OF SYLLABUS PAPERWISE:

PAPER I : General Pathology including Haematology
PAPER II : Systemic Pathology.

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BASIC GUIDELINES FOR PATHOLOGY PRACTICALS, GROUP DISCUSSIONS INTEGRATED TEACHING, INTERNAL ASSESSMENT etc.,

Total Hours : 200

HAEMOTOLOGY

Topics		No. of Hours
1. Estimation of HB:	a) Demonstration	1
	b) Conduction of Practicals with Basic standard questionnaire & model disease charts for interpretation	1
2. RBC & WBC counts:	a) Demonstration	1
	b) Conduction of Practicals with Basic standard questionnaire & model disease charts for interpretation	1
3. Hematocrit & ESR:	a) Demonstration	1
	b) Basic standard questionnaire & model disease charts for Interpretation	1
4. Peripheral smear:	a) Techniques of smear making & staining with demonstration	1
	b) Identification of cells - demonstration	1
	c) Model disease charts for interpretation	1
	d) Practicals:	
	i) Smears of Microcytic Hypochromic & Macrocytic Anaemial & Haemolytic Anaemias	1
	ii) Smears of CLL	1
	Smears of CML	1
	Smears of Acute Icukemia: AML or ALL	1
	iii) Eosinophilia	1
	All the above with basic standard Questionnaire	
5. Bleeding Time, Clotting Time & Platelet Demonstration		1
6. Reticulocyte count Demonstration with basic standard Questionnaire		1
7. Bone marrow Examination		
a) Methods of collection and demonstration		1
b) Study of normal marrow		1
c) Study of 2 abnormal bone marrows		1
8. Blood groups & related things		1

EXAMINATION OF URINE

1. Physical characters & different samples with pH & Sp gravity Demonstration	1
2. Chemistry of Urine with Albumin, Blood, Sugar, Ketone bodies, Bilesalts & pigments Demonstration with discussion about errors in interpretation	1
3. Practical Tests for students:	
a) Albumin + Blood Physical properties & Clinical correlation	1
b) Sugar + Ketone bodies Physical properties & Clinical correlation a & b with case charts for interpretation	1

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4. Microscopy:
   a) Casts, crystals, RBC, Puscells Demonstration 1
   b) Case charts for interpretation 1
5. Pregnancy Test: Demonstration, discussion of normal & Molar pregnancies & Choriocarcinoma 1

EXAMINATION OF BODY FLUIDS

1. Demonstration of CSF, Plueral fluid, Ascitic fluid & Sputum – Normal Inflammation and malignancy 1
2. Exfoliative Cytology :
   a) Techniques 1
   b) Demonstration of PAP, H & E of Cervical smears and Bronchial Wash 1
   c) 3 disease samples with discussion & Clinical correlation 1
3. FNAC
   a) Techniques Demonstration 1
   b) inflammatory & Neoplastic cases for discussion & Interpretation 1
4. Sex Chromatin demonstration- Buccal smear interpretation

EXAMINATION OF AUTOPSY

Techniques of Autopsy and Autopsy demonstration & recording of 4 diseases 4

INSTRUMENTS 3

1. RBC & WBC pipettes & diluting fluids
2. Neubauer chamber & Others
3. PCV Tube
4. ESR Tube
5. Hb Meter
6. Urino meter
7. Esbach's albumino meter
8. L.P. Needle
9. Bone marrow aspiration needles (Salah and Klima)
10. Cuvette of an autoanalyser

GROSSING OF SPECIMENS

5 Practical demonstration classes for 5 groups (min 30 specimens) 5 hours

INTEGRATE TEACHING

Topics as given by the University in the regulations of MBBS degree course - 20 hrs

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HISTOPATHOLOGY

Total Hours : 44

1. Histopathology Lab – Practical demonstration of steps involved	1
2. Staining Techniques, H&E Special stains : PAS, Vangieson, Sudan (Fat), Iron	2
3. Preparation of Requisition for Pathology Lab Points to remember - fixatives Clinical details Specific points regarding the lesion	1
4. Slides : Any 44 of the following with at least 16 from General Pathology	40 hours

General Pathology slides

1) Cloudy swelling
2) Fatty change
3) Hyaline change
4) Coagulation and caseous Necrosis
5) Cells of Acute & Chronic inflammation
6) Granulation tissue
7) CVC Lung & Liver
8) Thrombus
9) Amyloidosis (Spleen)
10) Rhinosporidiosis
11) Actinomycosis
12) Mycetoma
13) Filarial Lymph node
14) Leprosy
15) Squamous papilloma, adenoma
16) Lipoma, fibroma
17) Capillary & Cavernous angioma
18) Cellular features of malignancy
19) Squamous cell Ca. & adeno Ca.
20) Fibrosarcoma

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Systemic Pathology slides

1. Blood Vessels & Heart :
   a. Atherosclerosis
   b. Monckeberg's arteriosclerosis
   c. Hyaline arteriolsclerosis
   d. TAO
   e. Aschoff's body
   f. Myocardial infarction

2. Respiratorey system :
   a. Emphysema
   b. Bronchiectasis
   c. Lobar & Bronchopneumonias
   d. Pulmonary tuberculosis
   e. Carcinoma Lung

3. Kidney
   a. Chronic Glomerulonephritis
   b. Chronic Pyelonephritis
   c. Benign Nephrosclerosis
   d. Wilm's Tumor
   e. Renal Cell carcinoma

4. Breast.
   a. Fibroadenoma
   b. Duct cell carcinoma

5. Thyroid
   a. Hashimoto's Thyroiditis
   b. Grave's disease
   c. Follicular adenoma
   d. Papillary Carcinoma

6. Lymphonodes
   a. Hodgkin's lymphoma
   b. Non-Hodgkin's Lymphoma
   c. TB Lymph node

7. Salivary glands:
   Pleomorphic adenoma

8. Liver
   a. Cirrhosis
   b. Hepatoma

9. GIT
   a. Chronic Gastric ulcer
   b. Carcinoma stomach & colon
   c. Carcinoid appendix

10. Testis & FGT
   a. Seminoma
   b. Endomtrium Proliferative Secretory
   c. Leomyoma
   d. Dermoid Cyst
   e. Vesicular mole

11 Skin
   a. Basal cell carcinoma
   b. Melanoma

12. Musculo Skeletal
   a. Osteomyelitis
   b. Osteo sarcoma
   c. Chondro sarcoma
   d. Giant cell tumor
   e. Ewing's sarcoma

GROUP DISCUSSIONS
PRACTICAL - ORIENTED & THEORY- ORIENTED

-78 Hours

(with standard basic questionnaire) (14+64)

Topics: 7 x 2 : 14

a) Collection of blood, methods & anticoagulants
b) Anaemias
c) Haemorrhagic disorders
d) Leukemias & Lymphomas
e) Blood groups & Transfusion reactions
f) Urine changes _ Physical & Chemical Characters with clinical correlation
   Discussion of Jaundice

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g) Body fluids sampling (collection) preservation Techniques , variability in disease

h) Topics of certain common disorders in general and systemic pathology in the form of questionnaire and Group discussion - 32 topics excluding topics covered in integrated teaching. - 64 Hours

i) HIV

Each topic not more than 2 Hours.

INTERNAL ASSESSMENT - 12 hours

a. Three(3) Theory examinations of 2 hours each
b. One (1) Practical examination in divided batches together 6 hours.

NUMBER OF CLASSES (HOURS)

1.	Theory	:	113
2.	Practicals (Haematology-20, Urine-7, Fluids-6,Histopathology-44)	:	77
3.	Instruments	:	3
4.	Grossing of specimens	:	5
5.	Group discussion (Practical & Theory Oriented topics)	:	78
6.	Autopsy	:	4
7.	Integrated Teaching	:	20
	TOTAL	:	**300 Hours**

BOOKS RECOMMENDED :

1. Robbins Text Book of Pathology. *
2. Robbins Pathologic Basis of Disease by cotran, Kumar of Robbins— 6th / latest
3. Muiri's text book of Pathology edited by J.R. Anderson
4. Text book of Pathology edited by Nagalothinath, K.P. Deodher & V.H. Talib
5. Text book of Pathology by Harsh Mohan 3rd edition / latested.
6. A Text book of Pathology by N.c. Dey & T.K. Dey

REFERENCE BOOKS :

1. Boyd Text Book of Pathology – 2 vols. *
2. Anderson's Pathology Vol I & II 10th ed
3. Oxford text book of Pathology Vol I Vol II a 7 lib

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