

**Semester IV**

**Human Pathology**

**Marks: 150**

The curriculum of pathology aims at preparing the students in basic understanding of diseases and their pathogenesis. The topics are of introductory nature and build the concepts of how human system work in altered and diseased stage under the influence of various internal and external stimuli Thus the syllabi of pathology compliments and supplements the necessary knowledge students have gained in Physiology. Consequently it incorporates topics like cellular adaptations, inflammation, neoplasia, cellular ageing and other infectious diseases. Laboratory exercises have been designed to substantiate and clarify the theoretical concepts.

**THEORY**

**Total Lectures: 48**

**Unit I: Introduction**

**(2 Lectures)**

**(Chapter 1: Underwood and Underwood)**

History of pathology, basic definitions and familiarization with the common terms used in pathology, techniques used in pathology.

**Unit II: Cellular Adaptations, Cell Injury and Cell Death**

**(6 Lectures)**

**(Chapter 1: Robbins, Kumar and Cotran)**

Causes and mechanisms of cell injury: reversible and irreversible injury, Cellular responses: Hyperplasia, Hypertrophy, Atrophy, Metaplasia, Necrosis, Apoptosis, subcellular and intracellular response, (with suitable examples of diseases), Cellular ageing.

**Unit III: Role of Inflammation in diseases (with suitable examples)**

**(8 Lectures)**

**(Chapter 2: Robbins, Kumar and Cotran)**

General features of acute and chronic inflammation: Vascular changes, cellular events, termination of acute inflammatory response. Cells and molecular mediators of inflammation, morphological effects and outcome of acute inflammation., systemic effects of chronic inflammation, granulomatous inflammation.

**Unit IV: Tissue Renewal And Repair, Healing And Fibrosis (6 Lectures)**

**(Chapter 3: Robbins, Kumar and Cotran)**

Mechanism of tissue regeneration, role of ECM, repair by healing, scar formation and fibrosis, cutaneous wound healing, tissue remodeling in liver (mechanism of fibrosis and cirrhosis).

**Unit V: Hemodynamic Pathology**

**(5 Lectures)**

**(Chapter 4: Robbins, Kumar and Cotran)**

Edema, hyperemia, congestion, hemorrhage, hemostasis and thrombosis, Embolism, Infarction and shock and hypertension.

**Unit VI: Nutritional diseases  
(Chapter 9: Robbins, Kumar and Cotran)**

**(5 Lectures)**

Protein energy malnutrition, deficiency diseases of vitamins and minerals, nutritional excess and imbalances. Role and effect of metals (Zinc Iron and Calcium) in pathogenesis of cardiovascular and neurodegenerative diseases.

**Unit VII: Cell proliferation: Cancer  
(Chapter 7: Robbins, Kumar and Cotran)**

**(6 Lectures)**

Definitions, nomenclature, characteristics of benign and malignant neoplasms, grading and staging of cancer, biology of tumor growth, mechanism of tumor invasion and metastasis, carcinogens and cancer, concept of oncogenes, tumor suppressor genes, DNA repair genes and cancer stem cells.

**Unit VIII: Pathophysiology diseases  
(Chapters 17, 11 and 15: Robbins, Kumar and Cotran)**

**(10 Lectures)**

Diaorrhea, typhoid, arteriosclerosis, restrictive and obstructive respiratory diseases (COPD), silicosis.

**PRACTICALS**

1. Urine Analysis: Gross examination of urine for colour, odour etc. Abnormal constituents like protein, ketone bodies, glucose, blood, urea (any three)
2. Tissue Processing, embedding, sectioning. Staining and preparation of permanent histological slide.
3. Study of histological slides showing hypertrophy, hyperplasia, dysplasia, leukemia, cirrhosis and any common cancer.
4. Diagnostic tests for detection of various Diseases – CRP, VDRL, RA, Pregnancy, Dengue and HIV (any four)
5. Physiological data acquisition like EMG, PFT, Temperature EEG (any two)
6. PCR based diagnostics (for any one disease)
7. Measurement of Erythrocyte Sedimentation Rate.

**ESSENTIAL BOOKS**

1. Robbins and Cotran Pathologic Basis of Disease, 8<sup>th</sup> edition (2009), Vinay Kumar, Abul K. Abbas, Jon C. Aster, Nelson Fausto; Saunders Publishers.
2. General And Systematic Pathology, 2<sup>nd</sup> edition (1996), J., Ed. Underwood and J. C. E. Underwood; Churchill Livingstone.

3. Robbins Basic Pathology, 9<sup>th</sup> edition (2012), Kumar, Abbas, Fausto and Mitchell; Saunders Publication.

#### **SUGGESTED READINGS**

1. Medical Laboratory Technology Methods and Interpretations Volume 1 and 2, 6<sup>th</sup> edition (2009), Ramnik Sood; Jaypee Brothers Medical Publishers.
2. Pathophysiology, 3<sup>rd</sup> edition (2012), Lee-Ellen C. Copstead-Kirkhorn and Publisher Saunders