Clinical Pathology(Theory)

Total: 6hours /week
Lecture: 4 hours/week
Tutorial: 0 hour/week
Practical: 2 hours/week
Lab: 0 hours/week

Course Description
This course is designed to help students to acquire knowledge and skills on General Introductory Pathology in broader perspectives. This course deals with basics of subject, commonly used terminology, types and causes of human pathology, correlation between clinical diagnosis and pathological interpretation.

Course Objectives
After the completion of the course, the student will be able to:

- Introduce pathology and explain its importance.
- Define the terminology used in pathology.
- Identify the underlining pathophysiology in various disease processes.
- Apply pathological investigation in disease screening, diagnosis and prognosis.
- Explain the prevalence, pathology, clinical symptoms and diagnosis of various common infectious disease in Nepal.
- Explain the basic concept of neoplasia and tumor markers.
- Correlate the results of body fluid examination to various disease processes.

Course Content
A. Basic Pathology
Unit 1: General Pathology **10 hrs**

- Introduction to Pathology
- Fields of pathology
- Importance of Pathology
- Diagnostic technique used in Pathology

Unit 2: Cell injury and cellular adaptation **35 hrs**

- Introduction
- Definition of common terminologies used in cell injury and adaptation (Necrosis, Trauma, Hypoxia, Ischemia, Homeostasis, Atrophy, Hypertrophy, Hyperplasia, Metaplasia, Dysplasia, Aplasia, Apoptosis)
- Causes and Types of cell injury
- Mechanism of cell injury on biochemical basis
    - Decreased production of adenosine Triphosphate
    - Mitochondrial damage
    - Influx of Calcium and Calcium homeostasis
    - Accumulation of Oxygen derived free radicles
- Reversible and irreversible cell injury
- Necrosis and its Types.

- Cellular adaptation to injury
- Forms of cellular adaptation
    - Atrophy
    - Hypertrophy
    - Hyperplasia
    - Metaplasia
- Transplant rejection (Introduction and classification)
- Autoimmune diseases
    - Definition
    - Classification of autoimmune diseases
    - Pathogenesis
    - Laboratory findings

Unit 3: Inflammation **15 hrs**

- Introduction
- Common terminologies (Oedema, Erythema, Vasodilation, Granuloma, Acute, Chronic, Abscess, Exudates and Transudates)
- Types, causes and mechanism of
    - Acute inflammation
    - Chronic Inflammation
    - Chemical mediators of inflammation

Unit 4: Infection **30 hrs**

- Introduction
- Classification of Infection
- Mechanism of Infection
- Common terminologies (Agent, Host, Vector, symptoms, Signs, Diagnosis, Prognosis, Therapy, Prophylaxis, Incubation Period, Window Period)
- Introduction, Etiological agent, Route of transmission, Pathogenesis, Clinical manifestation, Laboratory diagnosis and Treatment of following Infectious diseases in Nepalese context
    - Candidiasis
    - Leprosy
    - Enteric Fever
    - Cholera
    - Scrub typhus
    - HIV/AIDS
    - Infectious hepatitis
    - Japanese encephalitis

Unit 5: Neoplasia **15 hrs**

- Introduction
- Common terminologies (Benign, Malignant, Metastasis, Carcinoma, Lymphoma, Sarcoma, Papilloma, Adenoma, Anaplasia, Pleomorphism)
- Difference between Benign and malignant tumours
- Etiology of cancer (Carcinogenic agents)
- Tumour markers; Definition, Classification and Applications.
- Laboratory diagnosis of cancer.

Unit 6: Specific specimen examination for Laboratory diagnosis **35 hrs**

- Examination of effusions (synovial, pleural, pericardial, peritoneal fluids)
    - Indications, Specimen collection, Physical, Chemical, Microscopic and Microbiological investigation
- Examination of urine
    - Composition of normal urine
    - Specimen collection
    - Physical, Chemical, Microscopic and Microbiological investigations
- Examination of cerebrospinal fluid
    - Composition of normal CSF
    - Specimen collection
    - Physical, chemical, Microscopic, and microbiological changes during diseases
- Examination of semen
    - Introduction
    - Specimen collection
    - Laboratory investigation
        - Measuring volume and appearance, Liquefaction time
        - Estimation of fructose and measurement of pH
        - Estimation of percentage of motile and viable spermatozoa
        - Performing Sperm Count
        - Estimation of Percentage of spermatozoa with normal morphology

Reference Books

- Textbook of Pathology Harshmohan
- Basic Pathology Robbins
- Urinalysis and Body Fluids Susan King Strasinger, Marjorie Schaub Di Lorenzo
- General and Systemic Pathology Ramadas Nayak

Unite	1	2	3	4	5	6	Total
Unite Hours	10	35	15	30	15	35	140
Marks	5	20	9	17	9	20	80

Clinical Pathology (Practical)

Practical: 70 hrs

- Perform urine specimen collection and its preservation.
- Perform routine and microscopic examination of urine (Urine R/ME)
- Prepare essential chemical reagents and perform urine examination for following analytes.
    - Sugar
    - Protein
    - Bilirubin
    - Bile salt
    - Ketone bodies
    - Urobilinogen
    - Chyle
    - Bence-John's protein
- Demonstrate urinary crystals and casts.
- Examine CSF, Ascitic fluid, Pleural fluid, Synovial fluid (protein, sugar, cell count)
- Collect appropriate specimen of semen and perform semen analysis.