

COURSE-SEC

SUBJECT: MEDICAL PATHOLOGY

MODE OF INSTRUCTION: Lecture & Demonstration

MODE OF ASSESSMENT: Practical or Project

PER SEMESTER CREDIT= 3

Objectives:

- The syllabus aims in providing general concepts regarding Haematology, Microbiology, Immunology, Clinical biochemistry, Common infectious and non-infectious diseases together with diagnostic and therapeutic modalities.
- The syllabus also provides basic idea regarding pathological tests as well as techniques commonly used for disease diagnostic purpose.
- The syllabus also contains modules on good laboratory practices & ethics, bio-medical waste disposal and management

MEDICAL PATHOLOGY SEC-1 (1ST SEMESTER)

Basic Laboratory Principles and Procedures: Sterilization, Preparation of Solutions and Reagents, Basic Equipment & Instruments

Haematology & Coagulopathies: Introduction to Haematology, Haematological Diseases, Haemostasis, Coagulation and Routine Coagulation Tests

Phlebotomy Main Concepts: Training for Withdrawing Blood, Safety & Infection Control Measures, Interpreting Investigation Slips, Equipment & Supplies required, Assisting Patient, Locating Appropriate site for Obtaining Blood Samples, Drawing Blood Specimen from Patients, Labelling the Samples, Portering the Samples, Updating the Patient Record

Immuno-hematology, Blood Banking Techniques and Transfusion Methods Main Concepts: Human & Rhesus Blood Group Systems, Other Blood Group Systems, Rh and Pregnancy, Blood Transfusion, Collection of Blood from the Donor, Storage of Blood, Blood Transfusion Reactions, Quality Control in Blood Bank Procedures, Blood Preservation, Biochemical Changes During Storage of Donor Blood Preparation and Selection of Blood Components

Assessment Tasks:

Demonstration of Various Laboratory Equipment & Instruments

Demonstration of the Preparation of Laboratory Solutions and Reagents.

Demonstration of the various ways of assisting the patient before, during and after the tests.

Demonstration on how to locate appropriate site for obtaining blood samples and correct way of drawing blood from patients

Demonstration on how to Interpret investigation slips.

Demonstration on preparing, labelling, storing and transferring the blood samples.

Demonstration of Routine Haematological Tests and Special Haematological Tests

Demonstration of Collection of Blood from the Donor and Separation of Blood Components

Demonstration of identification of Human Blood Groups, Rhesus blood groups

Demonstration of identification of Rh and Pregnancy test

Demonstration of Blood Transfusion Reactions

Demonstration of Identification of various kinds of Haematological Disease Conditions.

Demonstration of the Bleeding Disorders and Routine Coagulation Tests.

MEDICAL PATHOLOGY SEC-2 (2ND SEMESTER)

Bacteriology Main Concepts: Clinical Bacteriology Laboratory Aseptic Techniques, Culturing and Staining Methods, Identification of Gram Negative and Gram Positive Bacteria, Collection, Transport & Examination of Specimen.

Virology Main Concepts: Introduction to Virus, General Characteristics common to Virus, Methods of Inactivation of Viruses, General Transmission Routes for Viruses, Laboratory Diagnosis of Important Viruses

Bio-Medical Waste Disposal: Introduction to Bio-medical Waste Management, Categorizing Biomedical Waste, Appropriate Disposal of Urine and Stools, Disposal of Infectious Waste, Disposal of Hazardous Waste, Protocol to be followed in case of Exposure to Infectious or Hazardous Waste.

Lab Management and Ethics Main Concepts: Maintaining Equipment and Quality Control, Acts and Regulations including Safety Protocols, Confidentiality Protocols, Guidelines for Good Clinical Laboratory Practices.

Assessment Tasks:

Demonstration of the Collection, handling & Transport of Specimen/Samples maintaining Aseptic Condition

Demonstration of the Culturing, Staining and Identification of Bacteria

Demonstration of the Methods of Inactivation of Viruses.

Demonstration of Laboratory Diagnosis of Mycotic Infections

Demonstration on how to update patient records.

Demonstration on how to work safely in a lab without cross infection.

Demonstration on how to manage bio-medical waste in the workplace.

Demonstration of the Protocol to be followed in case of Exposure to Infectious or Hazardous Waste.

Demonstration of Appropriate Disposal of Urine and Stools

Demonstration of Disposal of Infectious Waste and Disposal of Hazardous Waste.

Demonstration of record keeping of rejected Specimen.

Demonstration of Data management in the Laboratory.

MEDICAL PATHOLOGY SEC-3 (3RD SEMESTER)

Clinical Pathology: Techniques for the Study of Pathology, Derangement of Homeostasis and Haemodynamics, Inflammation, Infectious, non-infectious and Parasitic Diseases, Neoplasia

Clinical Biochemistry: Renal Function Tests, Chemical Tests in Renal Disease, Gastric Function Test, Liver Function Tests, Cardiac Profile Tests, Acid base balance concepts & disorders, Phosphorylation, Enzymes, Vitamins, Milk & Composition of Milk

Immunology & Diagnostic Serology: Factors influencing Immunity, Immunological Reactions & Related Terms, Antibodies & Immunoglobulin Classes, Role of Antibodies in Diagnostic Applications, Antigen & Antibody Interactions, Serological Diagnosis of Microbial Diseases, Principles of Serodiagnostic Tests.

Cytology: Differentiation between Normal and Abnormal Cells, Sampling Techniques in Cytology, Various types of Specimens and Requirements for Cytological Studies, Various Cytological Tests, Fixation of Cytological Smears Importance of Cyto-Centrifuge in Cytology, Liquid Based Cytology (LBC)

Assessment Tasks:

Demonstrate how to calculate BMR, Energy & Nutritional Requirements of Human Body.

Demonstration of Blood Glucose & G6PD Deficiency.

Demonstration of Blood Urea Nitrogen, Serum Ammonia & Ammonium Salts.

Demonstration of Lipid Profile, Constituents of Bile and Serum Electrolytes.

Demonstration of Serological Diagnosis of Various Microbial Diseases such as Hepatitis & Tuberculosis, Syphilis, Enteric Fever.

Demonstration of Determination of Antibodies.

Demonstration of various Serodiagnostic Tests like ELISA, VDRL, WIDAL, C-Reactive Protein Test, Immunologic Pregnancy Test, detection of Hepatitis B 17 Surface Antigen, Detection of Dengue Fever IgM & IgG.

Demonstration of the Histopathological Examination of Tissues

Demonstration of Various Types of Tissue Fixatives and Fixation of Cytological Smears

Demonstration of Various Methods of Preparation of Tissue sections.

Demonstration of General Histological Staining Procedure.

Demonstration of how to Differentiate between Normal and Abnormal Cells

Demonstration of how to perform Sampling Techniques in Cytology

GENERAL MACHINERY REQUIREMENT FOR THE IMPLEMENTATION OF THE COURSE:

1. Centrifuge table top
2. Auto pipette 10-1000 μl (variable volume)
3. Microscope 1 per 5 trainee
4. Autoclave
5. Incubator
6. Laminar Hood
7. Calorie meter
8. Fridge

SUGGESTED READINGS

- Park, K. (2007), Preventive and Social Medicine, B.B. Publishers
- Godkar P.B. and Godkar D.P. Textbook of Medical Laboratory Technology, II Edition, Bhalani Publishing House
- Cheesbrough M., A Laboratory Manual for Rural Tropical Hospitals, A Basis for Training Courses
- Guyton A.C. and Hall J.E. Textbook of Medical Physiology, Saunders
- Robbins and Cortan, Pathologic Basis of Disease, VIII Edition, Saunders
- Prakash, G. (2012), Lab Manual on Blood Analysis and Medical Diagnostics, S. Chand and Co. Ltd.