1st SEMESTER
CLINICAL BIOCHEMISTRY: CLINICAL DIAGNOSTICS
SKILL ENHANCEMENT COURSE (SEC)

CBC125S: CLINICAL DIAGNOSTICS-I: FUNDAMENTALS OF CLINICAL DIAGNOSTICS AND LABORATORY SKILLS

CREDITS: THEORY - 2, PRACTICAL - 2

Objectives and Learning Outcome:

At the end of the course, the students shall be able to understand and apply core biochemical principles in clinical laboratory analysis, including safe sample handling and equipment use. Gain foundational knowledge of key biochemical parameters and hematological concepts relevant to diagnostic practice.

Unit I - Basic principles of Clinical Diagnostics (15 hrs)

Introduction to Clinical Biochemistry: Scope and Importance, Types of Samples, Sample Collection, Processing and its phases, Laboratory Safety and Ethics in Clinical Biochemistry, Principles of Biochemical Analysis: Colorimetry, Spectrophotometry, Electrophoresis; Introduction to Automation and Biochemistry Analyzers, Types of Analysers: Semiautomatic and fully Automatic; Point of Care Testing - Basic concept and application; Basics of Quality Control - Introduction to Internal and External QC

Unit II - Hematology (15 hrs)

Introduction to Hematology & Composition of Blood. Blood Collection: Venipuncture, Skin Puncture, Use of Tourniquet; Tube Additives and Labelling-use of Barcode; Erythrocyte Sedimentation Rate (ESR) and its Significance, Complete Blood Count (CBC) including Haematocrit (Packed Cell Volume), Red Cell Indices (MCV, MCH, MCHC)- Reference ranges and diagnostic implications. Overview of Hemostasis and Blood Coagulation. Blood Grouping and Rh System

Practicals (30 hrs)

1. Biochemical Calculations – Percent Solutions, Molarity, Molality, Normality and Preparation of Solutions of different concentrations
2. Blood Specimen Collection Techniques - venipuncture and Skin Puncture
3. Demonstration of Blood Grouping (ABO and Rh Typing)
4. Separation of Serum and Plasma from Blood
5. Coagulation Tests - PT, APTT, TT, INR

Recommended Books:

1. Tietz, N.W. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 5th Edition. St. Louis, MO: Elsevier/Saunders.
2. Mukherjee, K.L. Medical Laboratory Technology: A Procedure Manual for Routine Diagnostic Tests, Volume 1. 2nd Edition. New Delhi: Tata McGraw-Hill Education.
3. Kawthalkar, S.M. Essentials of Clinical Pathology. 2nd Ed. New Delhi: The Health Sciences Publisher.
4. Varley, H., Gowenlock, A.H., & Bell, M. Practical Clinical Biochemistry. 10th Edition. New Delhi: CBS Publishers & Distributors Pvt. Ltd.
5. Praful B. Godkar, Darshan P. Godkar Textbook of Medical Laboratory Technology, Clinical Laboratory Science and Molecular Diagnosis. Bhalani Publications.