

BACHELOR OF SCIENCE (GENERAL)
5th SEMESTER
DISCIPLINE SPECIFIC ELECTIVE (DSE)

OPTION – I

CLB520DA: CLINICAL BIOCHEMISTRY _ CLINICAL BIOCHEMISTRY AND ENZYMOLOGY
CREDITS: THEORY – 4, PRACTICAL – 2
MAXIMUM MARKS: 60, MINIMUM MARKS: 24

THEORY (4 CREDITS: 60 HOURS)

Objectives and Expected Learning Outcomes:

To encompass students with basic knowledge of enzymes and their diagnostic significance. The student will be able to describe the diagnostic significance of the main laboratory investigations, the principles of analytical measurement in clinical biochemistry and identify the meaning and use of laboratory investigations in connection with diseases of the major organ systems

UNIT-1 (15 Hours)

Enzyme: Classification and Nomenclature, Coenzymes and cofactors, Mechanism of enzyme action and properties of enzymes as catalysts, Concept of activation energy, Enzyme kinetics - equilibrium and steady state rate, rate equation and determination of K_m and V_{max}

UNIT -2 (15 Hours)

Enzyme regulation, Principles of catalysis, mechanism of enzyme catalysis, Factors affecting rate of enzyme catalysed reactions; Enzyme inhibition: Definition, Effect of inhibition on enzyme kinetics, Types of inhibition - reversible and irreversible inhibition.

UNIT -3 (15 Hours)

Diagnostic enzymology; Principles, definition of functional and non-functional plasma enzymes (Albumin and globulins), factors affecting enzyme levels in plasma or serum; enzymes and enzyme pattern in health and diseases with special mention of plasma lipase, amylase; alkaline, creatinine Kinase, SGOT and SGPT

UNIT -4 (15 Hours)

Carbohydrates- Estimation of glucose, glycosuria, GTT's, hyper- & hypo-glycemia, blood glucose regulation and role of hormones; Lipids- lipid profile estimation, hypercholesterolemia, hyper-lipo-proteinemia, atherosclerosis and its risk factors. Proteins and aminoacids-albumin, hypoalbuminemia, hypo-proteinemia, globulins, CRP, CSF proteins and their estimation.

PRACTICAL (2 CREDITS: 60 Hours)

MAXIMUM MARKS: 30, MINIMUM MARKS: 12

1. Estimation of alkaline phosphatase, serum acid phosphatase, ALT and AST
2. Estimation of Glucose in serum or plasma
3. Estimation of protein in blood and urine
4. Estimation of serum albumin
5. Estimation of cholesterol and lipoproteins (lipid profile) in serum or plasma

BACHELOR OF SCIENCE (GENERAL)
5th SEMESTER
DISCIPLINE SPECIFIC ELECTIVE (DSE)

OPTION – II

CLB520DB: CLINICAL BIOCHEMISTRY _ CLINICAL HAEMATOLOGY

CREDITS: THEORY – 4, PRACTICAL – 2

MAXIMUM MARKS: 60, MINIMUM MARKS: 24

THEORY (4 CREDITS: 60 HOURS)

Objectives and Expected Learning Outcomes:

This course encompasses the basic study of haematology and understanding of the various haematological disorders as well as their laboratory investigations. Students will learn the differential diagnosis and appropriate diagnostic evaluation of common hematologic abnormalities.

UNIT-1 (15 Hours)

Introduction to haematology- Definition, Importance and Important equipments used; Organization and safety measures in haematology laboratory; Formation of Cellular Components – Erythropoiesis, Leucopoiesis, Thrombopoiesis; Collection and preservation of blood sample for haematological investigations

UNIT -2 (15 Hours)

Overview of homeostasis and blood Coagulation- Definition, Mechanism, Coagulation factors, Bleeding time, whole blood coagulation time; Role of platelets, Anticoagulation- definition, function and types of anticoagulants

UNIT -3 (15 Hours)

Blood disorders - Anaemia and its classification, laboratory investigations and management, Iron deficiency anaemia; metabolism of iron, pathogenesis, laboratory investigations and management, Megaloblastic anaemia and pernicious anaemia - pathogenesis, laboratory investigations

UNIT -4 (15 Hours)

Hemoglobinopathies - qualitative and quantitative; Sickle cell anaemia - etiology, pathogenesis, clinical features, and laboratory investigations; Qualitative and quantitative disorders of platelets, Disorders of secondary hemostasis, hemophilia and its lab diagnosis

PRACTICAL (2 CREDITS: 60 Hours)

MAXIMUM MARKS: 30, MINIMUM MARKS: 12

1. Demonstration of equipments used in haematology – Sahli’s apparatus, blood cell counter
2. Screening of blood donor including physical examination with medical history of the donor
3. Methods for Collection and preservation of blood samples
4. Preparation of various fractions of blood
5. Haemoglobin estimation by SAHLI’s Method
6. Blood Grouping