

SEMESTER: 2nd

MAJOR COURSE

CBC222J: CLINICAL BIOCHEMISTRY (Human Physiology and Clinical Diagnostics)

Credits: Theory: 4; Practical: 2

Objectives and Expected Learning Outcomes:

To acquaint the students with structure, function and interrelationship of important organ systems of the human body. The students will learn structural-functional relation between human organ systems and the disorders associated with their malfunctioning. 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

Theory (4 Credits)

Unit I: Basics of clinical physiology - I

Liver function - Physiology and disorders (Jaundice, Hepatitis); Renal Function -Physiology of excretion and urine formation, Disorders (Glomerulonephritis, Renal calculi)

Unit II: Basics of clinical physiology - II

Blood system: Composition, cellular components and their functions. Hemoglobin, blood groups & coagulation, Disorders (anemia, leukemia & hemophilia); Endocrine function: Introduction to hormones. Physiological role of hormones (Pituitary, Adrenal & Thyroid hormones) and disorders (Diabetes Mellitus & Thyroid - hypo and hyper-secretion)

Unit III: Fundamentals of clinical biochemistry

Definition, history and scope of Clinical Biochemistry; Concept of Core laboratories, Quality Control in clinical labs (Pre-analytical, analytical and post-analytical control), Laboratory safety & safety equipments; Infectious hazards, Collection, preservation, handling and processing of body fluids – blood, urine, CSF for testing.

Unit IV: Clinical diagnostics

Liver Function Test, Kidney Function Test, Glucose estimation (FG, PP, GGT, GDM diagnosis, HbA1c), Thyroid Function Tests, Haematology- CBC, Erythrocyte indices (HCT, HB, MCV), ESR & PT, Blood Grouping, Molecular Diagnosis of diseases (SARS CoV-2, MTB)

Laboratory Course (Practicals: 2 Credits)

- 1) Blood Grouping
- 2) Haemoglobin estimation
- 3) Liver Function Tests
- 4) Kidney Function Tests
- 5) Thyroid Profiling.

Recommended Books:

1. Harold Varley, Practical Clinical Biochemistry, CBS. 10th edition, 2018
2. Principles of Biochemistry by Geoffrey Zubay. Publisher: McGraw Hill College.
Biochemistry by Lubert Stryer. WH Freeman and Co.
3. Biochemistry: The Molecular Basis of Life by Trudy McKee and James R McKee.
Publisher: McGraw-Hill Higher education.
4. Biochemistry and Molecular biology by William H. Elliott and Daphne C. Elliott. Oxford University Press.
5. Fundamentals of Biochemistry: Life at the Molecular Level 5th Ed. By Donald Voet, Judith G. Voet and Charlotte W. Pratt. Publisher: Wiley.
6. Devlin: Textbook of Biochemistry (with clinical correlation) (John Wiley and Sons Publishers).