

BACHELOR OF SCIENCE (GENERAL)

3rd SEMESTER

SKILL ENHANCEMENT COURSE (SEC)

BT320S: BIOTECHNOLOGY: CLINICAL DIAGNOSTICS

CREDITS: THEORY – 2, PRACTICAL – 2 (2+2)

THEORY (2 CREDITS: 30 HOURS)

MAXIMUM MARKS: 30, MINIMUM MARKS: 12

Objective: This course introduces students to different diagnostic tools, procedures and their application.

Unit-1 (15 HOURS)

Specimen handling, transport, preservation and disposal; Chemical composition of Biological Fluids - Blood, Urine and Cerebrospinal fluid; Reference range, Quality Control and Quality Assurance; Accuracy and Precision; Factors affecting accuracy of results.

Unit- 2 (15 HOURS)

Metabolite based Diagnostics - Routine blood & urine analysis; Liver function test; Renal function Test; Thyroid Function Test; Lipid Profile; Haematological Analysis; **DNA based Diagnostics**- PCR; RAPD; RFLP; DNA finger printing; **Immunodiagnosics** - Immunohistochemistry – principle and techniques; ELISA; RIA

PRACTICAL (2 CREDITS: 60 HOURS)

MAXIMUM MARKS: 30, MINIMUM MARKS: 12

1. Preparation of solutions (Buffer, Molar, Normal, percent solution)
2. Demonstration of Lab instruments –pH meter, centrifuge, spectrophotometer, etc.
3. Sample preparation - specimen collection, handling, preparation, processing, containment, barcoding, and tracking.
4. Visit to various Laboratories.

BOOKS RECOMMENDED

1. Molecular Cloning. A Laboratory Manual Sambrook, J. Fritsch, E.F. and Maniatis, T. - Cold Spring Harbor Laboratory Press.
2. Gene cloning & DNA analysis: An introduction, T.A. Brown, - Wiley-Blackwell.
3. Textbook: Molecular Diagnostics: Fundamentals, Methods and Clinical Applications, Lela Buckingham and Maribeth Flaws.

Expected Learning Outcomes:

1. Understanding and interpretation of diagnostic tools and investigations.
2. Concept of working principle, methodology and application of different diagnostic lab instruments