2nd SEMESTER
(CORE-2)
BC220C: BIOCHEMISTRY: CELL BIOLOGY, MICROBIOLOGY & IMMUNOLOGY

CREDITS: THEORY-4, PRACTICAL: 2
MAXIMUM MARKS: 60, MINIMUM: 24

THEORY (4 CREDITS: 60 HOURS)

Objectives / Expected Learning Outcomes: *This course aims to introduce the students to basic concepts in cell biology, microbiology and immunology with an expectation to learn how these systems could be lethal once they are dysregulated.*

Unit I: Cell Structure (15 HOURS)

Structure of, prokaryotic and eukaryotic cells, Structure and function of subcellular organelles like endoplasmic reticulum, nucleus, mitochondria, lysosomes, peroxisosmes, golgi apparatus, ribosomes. Plasma membrane and Plasma membrane models. Diffusion, passive and active transport, Porters, cell junctions, Extracellular matrix.

Unit II: Cell growth and Signal Transduction (15 HOURS)

Cell division: Mitosis and Meiosis; Basic concepts of Signal Transduction,
Components and general mechanism of Signal Transduction., Protein derived hormones,
Structure, function and mechanism of action of Insulin and Glucagon.

Unit III: Microbiology (15 HOURS)

General organization of bacterial and yeast cells, Cell wall structure of gram (+ve) and gram (-ve) bacteria. Bacterial growth, culture of bacteria and types of culture media. Sterilization and disinfection. Yeast cell culture, Role of Bacteria and Yeast in genetic engineering. Plasmids and their role in genetic engineering.

Unit IV: Immunology (15 HOURs)

Types of Immunity, Cells of immune system, Antigen recognition and antibody formation, Immunoglobulin, structure, classes and subclasses. Hybridoma technology, Monoclonal vs Polyclonal antibodies, Hypersensitivity and allergies. Primary and secondary lymphoid organs. Basic concept of AIDS and Autoimmune disorders.

PRACTICAL (2 CREDITS: 60 HOURS) MAX.MARKS 30, MIN. MARKS 12)

1) Preparation of Bacterial culture media
2) Sterilization techniques
3) Staining of Gram +ve and Gram –ve bacteria
4) Blood grouping
5) Growth and identification of Yeast

BOOKS RECOMMENDED

1. Text book of Microbiology by Davis, Dulbecco et al.
2. General Microbiology by Roger Stanier and Prescot
3. Immunology by Kuby
4. Cell biology-Karp, NPTL notes