Second Year Third Semester

Course 3001 MICROBIOLOGY 45 Lectures, 3 credits

Objectives:

- To study the basic macromolecules in a cell.
- To understand the structure and function of DNA.
- To study growth cycle of microorganisms and methods of measurement.

UNIT 1 : Study of Macromolecules (15 Lectures)

Definition, Classification, Structures and Biological Role of:

- Proteins - General structure and properties of amino acids. Brief outline of structure of protein and function.
- Carbohydrates - Monosaccharides, oligosaccharides (Lactose, Sucrose, maltose, cellobiose) Polysaccharides (Starch, glycogen, peptidoglycan, cellulose)
- Lipids storage and structural lipids.

UNIT II : Study of Nucleic acids and gene (15 Lectures)

- Gene and its function, Central Dogma of molecular biology.
- Discovery of DNA as genetic material Grifth experiment, Harshey and Chase experiment.
- Nucleic acid - basic structure, components of DNA and RNA, nucleosides, nucleotides.
- DNA structure - Double helix (Watson and Crick model), different forms of DNA and important features of DNA structure, DNA replication is semi-conservative, a gene codes for a single polypeptide, recombination occurs by physical exchange of DNA, genetic code is triplet.
- Stem and loop structure of DNA and its importance.
- Genetic elements the chromosome, non-chromosomal genetic elements, viruses, plasmids, transposable elements.

UNIT III : Study of Growth of Microorganisms (15 Lectures)

- Growth curve.
- Measurement of growth.

a) Direct Microscopic count Breed's count, Petroff Hausser counting chamber, Haemocytometer.

b) Viable count, spread and pour plate technique.

- Turbidity measurements - Nephelometer, spectrophotometer.
- Effect of environmental factors on growth.

References:

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