

MANGALORE UNIVERSITY
DEPARTMENT OF MICROBIOLOGY

MSc Microbiology

MBH- 451: Microbial Physiology

56h

OBJECTIVES

1. Study of the structures, classification and function of various molecules such as carbohydrates, proteins, lipids and vitamins.
2. Metabolisms of bio-molecules through various pathways.
3. Study of bio-energetic and interaction of biomolecules.
4. Study on laws of thermodynamics.

COURSE OUTCOME

CO1: Understanding structure, classification and role of enzymes in microbial metabolism

CO2: Establishment of fermentation industry and biochemical labs.

CO3: To understand the enzyme kinetics.

CO4: Understanding of bio-molecule interaction.

CO5: Amino acids, vitamins, Lipids in cells

Unit I

Bioenergetics: Entropy, enthalpy, Electron donors, electron carriers, Inhibitors, Uncouplers, Energy bonds, Phosphorylation, Concepts of acids and bases, pH and Buffers. High Energy yielding phosphate bonds. ATP, Creatine Phosphate. Laws of Thermodynamics, Interactions of Biological macromolecules- Vander waal's interaction, Hydrophobic, Hydrogen-Bonding interactions, Ionic bonding.

Unit II

Amino Acid and Peptides, Protein structure: Primary, Secondary, Tertiary and Quaternary. Carbohydrate: Structure, Classification, Cell wall Polysaccharides. Vitamins: Role of Vitamins: Role of Vitamins and Coenzymes, Lipids: simple and compound lipids and their properties.

Unit III

Aerobic and Anaerobic respiration, EMP pathway, Kreb's Cycle, Phosphorylation, ED pathway, Pentose- Phosphate pathway, Homo and Hetero Lactic Fermentation. Gluconeogenesis, Glyoxalate pathway, bio synthesis of peptidoglycan (fermentation)

Unit IV

Enzymes: Definition, Classification, Kinetics, E-S complex, interactions. Inhibitions – reversible and irreversible. Michaelis – Menton equation, Specificity, Active Site, Regulatory Site, allosteric regulators, ribozymes and abzymes.

Note: Each unit is for 14h

