**Microbial Physiology -Metabolism BVOMLT-201**

**UNIT I**

Microbial Nutrition, Cultivation, Isolation and Preservation

Microbial Nutrition: Requirements for Growth. Physical requirement (Temperature, pH, osmotic pressure), chemical requirements (C, N, S, P, O). Culture Media : Chemically defined media, complex media, anaerobic growth media, selective & differential media, and enrichment culture. Cultivation of Aerobes and Anaerobes. Microbial Growth : Growth in population, bacterial growth curve, mathematical nature and expression, measurement of growth in bacteria, Factors affecting growth in microorganisms, continuous cultures and synchronous cultures.

**UNIT II**

Enzymes and their Regulation: Chemical and physical properties of enzymes. Nomenclature of Enzymes. Mechanism of enzymes action. Inhibition of enzyme action. Regulation of enzymes.

**UNIT III**

Microbial Metabolism-I Respiration and fermentation. Glycolysis, Pentose Phosphate pathway, The Entner Doudoroff pathway, Fermentation. Tricarboxylic acid cycle. Catabolism of lipid, proteins. Glyoxylate cycle. Beta oxidation.

**UNIT IV**

Microbial Metabolism –II Microbial Utilization of Energy & Biosynthesis : Transport of nutrient by bacteria. Biochemical mechanisms of generation of ATP. Synthesis of Amino Acids : Glutamate, lysine, glutamine, serine, arginine family. Structures and biosynthesis of cell wall peptidoglycan.

Biosynthesis of Carbohydrates (gluconeogenesis) & Phospholipids. Replication of DNA molecules, Transcription & Translation (process of protein synthesis) Bacterial Genetics : Conjugation, Transformation, Transduction (generalized transduction, specialized transduction), The Regulation of Gene Expression : Lac operon, tryptophan operon.