4th Semester	**REV4C002**	**Environmental Microbiology and Toxicology**	**L-T-P 3-0-0**	**3 CREDITS**

Module-I (10 Hrs)

General properties of microorganism: Environmental importance of microorganism, classification, distribution, enumeration of microbes, prokaryotic & Eukaryotic cells.
Bacteria: Cell structure, Spore, Morphology and reproductions, Bacterianutration, Culture media and culture characteristics, growth of bacteria, batchculture, specific growth rate and doubling time, continuous culture, synchronous growth, effects of environmental factors on growth.

Module-II (10 Hrs)

Control of microbes: physical and chemical methods, destruction and suppression. Microbialmetabolisms: Anabolism and catabolism, Glycolysis, TCA cycle and ETC, Fermentation and anaerobic respiration, Energy balance (ΔG) -Growth, Substrate Partitioning and theoretical yield, Electronacceptors, Enzyme, Monod and Halden kinetics.

Module-III (10 Hrs)

Drinking water microbiology: Streampollution, Water borne diseases and pathogens,MPN test, Faecal coliform and faecalstreptoccoci, MFtechniques,IMVICtest.Air microbiology: air borne diseases and pathogens.Soilmicrobiology:Bio-fertilizer,VAMfungi,N-fixations,Bio-pesticides,degradation of natural substances. Composting,Bio-energy from waste.

Module-IV (08 Hrs)

Toxicology:- Toxic substances and toxicity, environmental toxicants and its classification, Exposure to toxicants. Dose response relationship. Biotransformation of toxicants. Factors affecting toxicity.

Module-V (07 Hrs)

Toxicity of metals like mercury, cadmium, arsenic lead, fluorides, toxicity of pesticides, Bio magnification, Antidotes and neutralization of toxicity.

Books:

- Microbiology – P.D.Sharma – Rastogi publication
- Concept of Toxicology – Omkar – Shoban Lal Nagin Chand & Co.
- Microbiology— Chan etel-McGraw Hill-New Delhi Lehninger Principles of Bio-Chemistry- Nelson & cox