B.Tech(EnvironmenTAlEngineering)SyllabusforAdmissionBatch2017–18 7th /8th semester

PEN7J001 ENVIRONMENTALBIOTECHNOLOGY 3-0-0

Module I

Introduction to environmental biotechnology, Cell genetic material, Nucleic acidbased methods of analysis- Polymerase chain reaction, Recombinant DNA techniques- Cloning, metagenomics, Sequence analysis, Comparative genomics.

Module II

Bacterial genetic recombination, Recombinant DNA technology, Applications in Environmental Engineering. Bioremediation for Soil Environment- Biotechnologies for Ex-Situ Remediation of Soil, Biotechnologies for in-Situ Remediation of Soil, Phytoremediation Technology for Soil Decontamination.

Module III

Bioremediation for Water Environment- Ex-situ Decontamination of Groundwater, Insitu Bioremediation of Groundwater, Landfill Leachate, Industrial Wastewater Biotreatment Technologies, Biotreatment of Surface Waters. Bioremediation for Air Environment- Atmospheric Environment for Microorganisms, Microbial Degradation of Contaminants in Gas Phase, Biological Filtration Processes for Decontamination of Air Stream, Bioscrubbers.

Module IV

Biotreatment of Metals- Microbial Transformation of Metals, Biological Treatment Technologies for Metals Remediation, Bioaccumulation, Oxidation/Reduction Processes, Biological Methylation, Recovery of metals. Biological energy sources, Microbially mediated oil recovery.

Books & References:

- 1. B. E. Rittmann and P. L. McCarty, Environmental Biotechnology: Principles and Applications, 1st Edn., McGraw-Hill Publishing Co., 2001.
- 2. B. Bhattacharya and R. Banerjee, Environmental Biotechnology, 1st Edn., Oxford University Press, 2008.
- 3. Prescott, L. M., Harley, 3. P., and Klein, D. A., Microbiology, Second Edition, Wm. C. Brown Publishers, Dubuque, Iowa, 1993.
- 4. R. W. Pickup and J. R. Saunders, Molecular Approaches to Environmental Microbiology, 1st Ed., PrenticeHall, 1996.