

B.Tech. Biotechnology: Semester-V BBT 501: ENVIRONMENTAL BIOTECHNOLOGY	
Teaching Scheme	Examination Scheme
Lectures: 3 hrs/Week	Class Test -12 Marks
Tutorials: 1 hr/Week	Teachers Assessment – 6 Marks
Credits: 4	Attendance – 12 Marks
	End Semester Exam – 70 marks

Course Objective

The objective is to learn about the environment and its surroundings; why to keep the environment clean; how to manage alternative energy sources etc. To give a broad overview of environment, the pollutants and restoration techniques of polluted land and to explain the importance and application of biotechnology in agriculture and genetics for welfare of human beings

Course Learning Outcomes

After completing the course, the student shall be able to:

CO1: Scope & Importance, Need For Public Awareness.

CO2: Environment definition, Ecosystem – Types & Factors of Ecosystem,

CO3: Environmental Pollution and their effects. Understand various types of pollutions along with its sources and effects. Analyze different laws and policies enforced to regulate pollution. Identify various techniques for reforestation as a source of bioremediation. Understand the concept of biofertilizers, biopesticides and bioinsecticides.

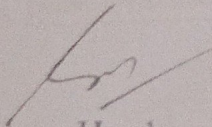
CO4: Environmental Protection- Role of Government, Legal aspects, Initiatives by Non-governmental Organizations (NGO),

Unit 1: Introduction to Environment

Concept of ecology and ecosystem, environmental pollution (Water, soil and air) noise and thermal pollution, their sources and effects. Environmental laws and policies.

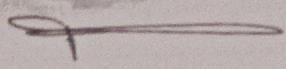
Bioremediation and Biorestoration: Reforestation through micropropagation, development of stress tolerant plants, use of mycorrhizae in reforestation, use of microbes for improving soil fertility, reforestation of soils contaminated with heavy metals.

Unit 2: Sewage and waste water treatments:

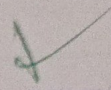


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Anaerobic and aerobic treatment, conventional and advanced treatment technology, methanogenesis, methanogenic, acetogenic, and fermentative bacteria technical process and conditions, emerging biotechnological processes in waste – water treatment.

Solid waste management: Landfills, composting, earthworm treatment, recycling and processing of organic residues. Biodegradation of xenobiotic compounds, organisms involved in degradation of chlorinated hydrocarbons, substituted simple aromatic compounds, polyaromatic hydrocarbons, pesticides, surfactants and microbial treatment of oil pollution.

Unit 3: Environmental Biotechnology in Agriculture:

: Biofertilizers and microbial inoculants, biopesticide, bioinsecticides, bioherbicides Biofuel: Plant derived fuels, Energy crops, Biogas, Bioethanol, biohydrogen Environmental genetics: degradative plasmids, release of genetically engineered microbes in environment.

Suggested Readings

- Environmental Studies , Benny Joseph; Tata McgrawHill,2005
- Environmental Studies, Dr. D.L. Manjunath; Pearson Education-2006
- Environmental studies, R. Rajagopalan; Oxford Publication – 2005
- Text book of Environmental Science & Technology, M. Anji Reddy, BS Publication, Revised edition.
- Environmental Biotechnology by Alan Scragg (1999); Longman.
- 2. An Introduction to Environmental Biotechnology by Milton Wainwright (1999): Kluwer Press


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