

# MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

## B. Sc. BIOTECHNOLOGY III YEAR TDC (2016-17)

### **Paper III : *Natural Resources and Environmental Biotechnology***

#### **Unit-I**

Natural resources- Energy resources (renewable and non-renewable), conventional and non-conventional sources of energy, forest resources, fish resources, water resources. Conservation of natural resources- *ex situ* and *in situ* conservation strategies, wildlife management, afforestation, world conservation strategies (WCS) and National Conservation Strategies (NCS)

**15 Credit hours**

#### **Unit – II**

Waste water and its treatment, small scale and large scale sewage treatment, BOD and COD. Ground water remediation, water softening, water demineralization, desalination, ion-exchange and reverse osmosis, disinfection of water; ozonation and chemo-sterilization of water.

**15 Credit hours**

#### **Unit – III**

Solid waste and their treatment, organic compost and process of composting, vermiculture technology. Microbial degradation of xenobiotics, microorganism in abatement of heavy metal pollution, aeromicrobiology: aeroallergens and aeroallergy.

**15 Credit hours**

#### **Unit – IV**

Environmental biotechnology- scope and applications, concepts of cleaner technology application of immunofiltration and immunoprecipitation, DNA probing methods for detection of microbial pathogens in aquatic environment. Biogas, biogas production- Solubilization, acetogenesis and methanogenesis , mechanism of methane formation.

**15 Credit hours**

#### **Unit – V**

Microbes and their genetic engineering for degradation of pollutants, application of microbes as biofertilizer, biopesticides, microbial leaching, biomining, biohydrometallurgy and biomineralization. Principles and applications of biosensors for detection of pollutants, Oil spills- Causes and recovery, use of super bugs for removal of oil spills.

**15 Credit hours**

### **Suggested Readings**

1. Mooray Moo-Young. (Eds). Comprehensive Biotechnology (Vol. I, II, III) Pergamon Press, England.
2. Metcalf and Eddy. Waste water engineering treatment and uses. McGraw Hill.
3. Jogdand, S.N. Environmental Biotechnology. Himalaya Publication House.
4. De, A.K. Environmental Chemistry. Wiley Eastern Ltd.
5. Abbasi and Abbasi. Renewable Energy Sources and their environmental impact. Prentice Hall of India, Pvt. Ltd.
6. Chatterji, A.K. Introduction to Environmental Biotechnology. Prentice Hall of India.