

**BIM -E503**  
**DSE-1 ENVIRONMENTAL MICROBIOLOGY**

MM : 100  
Time : 3 hrs  
L Credit  
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Sessional : 30  
ESE : 70  
Pass Marks : 40

Total Hours: 60

**Learning objectives:**

- To understand how microorganism adapt to different environment and their interaction with different habitat and also the spread of microorganism from the environment.
- To know different techniques of detection of air, soil and aquatic
- To acquire knowledge of treating sewage and industrial water through different means.

**Learning outcomes:**

At the end of course student will be able to

- Isolate and identify pathogenic microorganism from air, soil and water habitat
- Characterize the waste water and also explain the method that can be utilized in waste water treatment.

**UNIT - I**

Microorganisms in different habitats: brief account of heterogeneous group of microorganisms, different habitats such as soil, water, air; factors affecting microbial population in nature.

(10 Lectures)

**UNIT - II**

Water microbiology: type of water (atmospheric, surface and stored), parameters of aquatic environment (temperature, light, pressure, pH, turbidity and organic constituents); Microflora of aquatic environmental (fresh water and marine microbiology; deep sea-vent, volcano and soda lake.

(15 Lectures)

**UNIT - III**

Microbiology of domestic and waste water: sewage/waste water (physical, chemical and microbiological analysis), BOD and COD; Waste water treatment (primary, secondary and tertiary treatment),

(10 Lectures)

**UNIT - IV**

Solid waste management: solid waste processing (landfills, composting and anaerobic sludge digestion), Effect of solid waste on public health; Microbial pathogens in municipal solid waste; Regulation for disposal of biohazardous materials.

(12 Lectures)

**UNIT - V**

Bioremediation and Biodegradation: concept of bioremediation, types of bioremediation, Microbial degradation of Xenobiotics; Bioindicators of pollution.

(13 Lectures)

**Suggested Reading**

1. N.S. SubbhaRao, Soil Microbiology, Science Publisher, ISBN: 9781578080700
2. Dubey, R.C. *Advanced Biotechnology*. S. Chand & Co. P Ltd, New Delhi, p. 1161; ISBN: 81:219-4290-X.
3. P.D. Sharma, Microbiology, Rastogi Publication ISBN: 978-8171339358.
4. Dubey R.C. and Maheshwari, D.K. *A Textbook of Microbiology*. 3rd ed., S. Chand & Co, Ram Nagar, New Delhi, p. 1034. ISBN 81-219-2620-3

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