B.Sc. IV Year

Semester – VIII

BIM –E803
DSE-12 MICROBIOLOGICAL ANALYSIS OF AIR AND WATER

MM : 100
Time : 3 hrs
L Credit
4 4

Sessional : 30
ESE : 70
Pass Marks : 40

Total Hours: 60

Learning objectives:

- To understand how microorganisms adapt to different environments and their interaction with different habitats and also the spread of microorganisms from the environment.
- To know different techniques of detection of microorganisms from air,soil, and aquatic environment.
- To acquire knowledge of treating polluted water.

Learning outcomes:

At the end of course student will be able to

- Perform and demonstrate different methods used to determine the quality of water and air.
- Purify the household water through physical, chemical and biological methods.

UNIT - I

Aeromicrobiology: Bioaerosols, Air borne microorganisms (bacteria, viruses, fungi) and their impact on human health and environment, significance in food and pharma industries and operation theatres, allergens. **(16 Lectures)**

UNIT - II

Air Sample Collection and Analysis: Bioaerosol sampling, air samplers, methods of analysis, CFU, culture media for bacteria and fungi, Identification characteristics. **(14 Lectures)**

UNIT - III

Control Measures: Fate of bioaerosols, inactivation mechanisms – UV light, HEPA filters, desiccation, Incineration. **(08 Lectures)**

UNIT - IV

Microbiological Analysis of Water: Sample Collection, Treatment and safety of drinking (potable) water, methods to detect potability of water samples: (a) standard qualitative procedure: presumptive/MPN tests, confirmed and completed tests for faecal coliforms (b) Membrane filter technique and (c) Presence/absence tests. **(16 Lectures)**

UNIT - V

Control Measures: Precipitation, chemical disinfection, filtration, high temperature, UV light. **(06 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

DSE 12 SEMESTER VIII / BIM-E853 (LAB COURSE CC-12)

The practicals based on BIM E803 will be performed.

1. To perform isolation of air borne microorganisms (bacteria & fungi) by settle plate method.
2. To perform sampling of air (bioaerosol sampling) using air sampler and enumeration of air microflora.
3. Bioburden testing of different water samples.
4. Demonstration of potability of water using presumptive/MPN test.
5. Demonstration of potability of water using confirmed and completed test
6. Demonstration of potability of water using membrane filter technique