B.Sc. II Year **Semester – III**

BIM -S302
SEC-1 TOOLS AND TECHNIQUES

MM : 100
Time : 3 hrs
L Credit
4 4

Sessional : 30
ESE : 70
Pass Marks : 40

Total Hours: 60

Learning objectives:

- To get the knowledge of sophisticated and common instruments used in the microbiology laboratory
- To know aseptic techniques to keep the instrument and media sterile.

Learning outcomes:

At the end of course students will be able to

- Maintain the sterility of glassware, utensils and medium by different physical and chemical procedure.
- Operate the different sophisticated instruments available in the laboratory.

UNIT–I

Industrial microbiology- Definition and scope, history of industrial microbiology, industrial microbiology in present scenario, development of industrial microbiology in India.

(06 Lectures)

UNIT-II

Basic knowledge of different instruments and their applications in microbiology such as microscope (Compound, SEM & TEM), micrometry, hot air oven, autoclave, laminar air flow and BOD incubator.

(10 Lectures)

UNIT–III

Isolation of industrially important microorganisms, Primary screening (crowded plate technique, auxanography technique, enrichment culture technique, differential culture technique), Importance of screening.

(14 Lectures)

UNIT–IV

Aseptic technique: contamination, sterilization (heating, steam sterilization, tyndallization, dry heat, chemicals, radiation sterilization, filter sterilization), sterilization of air.

(14 Lectures)

UNIT–V

Chromatography techniques: paper chromatography, thin layer chromatography, adsorption column chromatography, gas liquid chromatography, gel permeation, ion exchange and affinity chromatography, gel electrophoresis.

(16 Lectures)

Suggested Reading

1. 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
2. Prescott's Microbiology, 10th Edition, McGraw Hill Publication
3. Dubey, R.C. and Maheshwari, D.K. *Practical Microbiology*. 2nd ed., S. Chand & Co. P Ltd, New Delhi, p. 413. ISBN: 81:219-2559-2
4. Dubey, R.C. *Advanced Biotechnology*. S. Chand & Co. P Ltd, New Delhi, p. 1161; ISBN: 81:219-4290-X.

17.4.21

DSC 3 SEC 1 SEMESTER III BIM-C351 (LAB COURSE)

1. Determination of growth curve of bacteria.
2. Bacterial population count by turbidimetry method
3. Amylase production test.
4. Cellulase production test.
5. Demonstration of carbohydrate metabolism.
6. Demonstration of enzyme activity in given mocroorganism.
7. Detection of number of bacteria in milk by standard plate count technique.
8. Determination of quality of milk sample by MBRT (methylene blue reductase test).
9. Laboratory preparation of sauerkraut.
10. Different tools in microbiology lab (Autoclave, Laminar Air Flow, Incubator, Hot Air Oven, and Light Microrscope).
11. Effect of ultraviolet radiation on bacterial growth.
12. Effect of dyes on bacterial growth.
13. Separation of leaf pigments through paper chromatography on bacterial growth.

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