B.Sc. I Year **Semester – II**

BIM -C201
DSC-2 MICROBIAL TECHNOLOGY

MM : 100
Time : 3 hrs
L Credit
4 4

Sessional : 30
ESE : 70
Pass Marks : 40

Total Hours: 60

Learning objectives:

- To learn and understand the cultivation technique of aerobic and anaerobic bacteria
- To know the isolation and preservation techniques of bacteria.
- To get the knowledge of agriculture techniques for improving crop production.
- To understand how biopesticides will be prepared from bacteria and fungi

Learning outcomes:

At the end of course student will be able

- To cultivate aerobic and anaerobic bacteria in the laboratory.
- To preserve industrially important bacteria in the laboratory.
- To develop biopesticide from bacteria and fungi.

UNIT – I

Cultivation of bacteria: aerobic and anaerobic; Culture media: types and preparation; various techniques used for isolation of microorganisms from soil, water and air; pure cultures techniques; cultural characteristics; Preservation techniques.

(10 Lectures)

UNIT – II

History of evolutionary trend of fermentor from ancient to modern period/era; shake flask, bioreactor, construction material:Design of fermentors; aeration and agitation, control of pH, temperature, foaming agents, biosensor.

(12 Lectures)

UNIT -III

Fermentation media and its preparation: sterilization of apparatus and production media;Inoculum preparation; downstream processing;Types of fermentation: batch, fed batch, continuous, dual or multiple, surface and submerged fermentation.

(15 Lectures)

UNIT -IV

Agricultural microbiology: Plant growth promoting rhizobacteria (PGPR); N_2- fixers and phosphate solubilizers; production of bioinoculants; cyanobacteria, bacteria and fungi.

(11 Lectures)

UNIT -V

Biopesticides: concept of biopesticides;advantages of biopesticides; microorganisms used for preparation of biopesticides; Mass production of microbial pesticides in general: bacterial and fungal pesticides.

(12 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. 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
3. Casida, L.E.J.R. Industrial Microbiology, New Age International Publisher.
4. A.H.Patel, Industrial Microbiology, Laxmi Publication, **ISBN-10:** 9385750267
5. Prescott and Dunns.Industrial Microbiology, CBS Publishers and Distributers, ISBN-10: 8123910010
6. Dubey, R.C. *Advanced Biotechnology*. S. Chand & Co. P Ltd, New Delhi, p. 1161; ISBN: 81:219-4290-X.

DSC 2 SEMESTER II / BIM-C151 (LAB COURSE CC-02)

1. Isolation of bacteria from soil by serial dilution method.
2. Isolation of Phosphate solubilising bacteria.
3. Isolation of aquatic fungi by bait technique.
4. Effect of pH on growth of microorganisms.
5. Effect of temperature on growth of microorganisms.
6. Determination of oxygen requirement of given bacteria.
7. Demonstration of fermentation by yeast.
8. Isolation of cyanobacteria from paddy fields.
9. Isolation of root nodulating bacteria from leguminous plants.
10. Isolation of bacteria inhibiting phytopathogenic fungi
11. Cultivation of anaerobic bacteria

B.Sc. I Year **Semester – II**

BIM –V201

VAC-2

Credits: 2
