

DSE-10 Applied Microbiology and Plant Pathology

MM : 100
 Time : 3 hrs
 L Credit
 4 4

Sessional : 30
 ESE : 70
 Pass Marks : 40

Total Hours: 60

Learning objectives:

- To understand the Vedic culture in which there is description of different information related to microorganisms and also they will know how earth evolved and also know the landmarks discoveries of microbiology
- To acquire knowledge of different technique to stain microorganism and how they can visualize the microorganisms in different types of microscope.
- To acquire an overall knowledge on the morphology and functions of the structures with the prokaryotes and eukaryotes.
- To become familiar with general characteristic of prokaryotic and eukaryotic microbes and also acquire knowledge of cellular organization, life cycle and economic importance of prokaryotic

Learning outcomes:

At the end of course student will be able to

- Know the different milestones in the history of microbiology, importance of Vedic microbiology
- Understand and know the application of techniques used in the field of Microbiology.
- Identify key constituent prokaryotes cell and their function.
- Classify the prokaryotic cell by conventional as well as modern methods.
- Stain the bacteria with simple, differential and-special stain.

UNIT-I: General Microbiology

(8 Lectures)

General features of various groups of microorganisms: bacteria, cyanobacteria, archaea, mycoplasma, viruses (Morphology and Multiplication of T4 Bacteriophage), protozoa and fungi, Bacterial cells (size and arrangement), ultra structure of bacterial cells.

UNIT-II: Golden age of Microbiology

(8 Lectures)

Historical account of microbiology, spontaneous generation vs biogenesis, golden age of microbiology, contributions made by Anton von Leeuwenhoek, Louis Pasteur, Robert Koch and Edward Jenner, Joseph Lister, Alexander Fleming; Germ theory of disease.

UNIT III Applied Microbiology

(14 lecture)

Food fermentation and food produced by microbes, amino acids, Production of antibiotics, vitamins, alcoholic beverages, organic acid & genetic recombinant vaccines. Mass production of bacterial biofertilizers, blue green algae, Azolla and mycorrhiza. Plant growth promoting rhizobacteria & biopesticides—*Trichoderma* sp. and *Pseudomonas*, Single cell proteins, Organic farming inputs, Microbiology of air and water.

UNIT IV: Plant Pathology

(14 lecture)

Disease concept, symptoms, etiology and causal complex, Primary and secondary inoculums, Infection, pathogenicity and pathogenesis, Koch's Postulates. mechanism of infection (Brief idea about Pre-penetration, Penetration and Post-penetration). Defence mechanism with special reference to Phytoalexin, Resistance- Systemic acquired and induced systemic. Fungicides- Bordeaux mixture, Lime sulphur, Tobacco decoction, Neem cake and oil.

UNIT- V: Diseases and Control

(16 lecture)

Symptoms , causal organism, **disease cycle and control measures of** – Early and late blight of Potato, Brown spot of rice, Black stem rust of wheat, **White rust of crucifers**, Red rot of sugarcane, Wilting of Arhar, Mosaic disease of papaya; citrus canker; damping off of seedlings, Disease management: - quarantine, chemical, biological, integrated pest disease management.

Handwritten signatures and dates at the bottom of the page, including "27/5/22", "34", "27/5/2022", and "talbana".

DSE 10 SEMESTER VIII / BBO-E851 (LAB COURSE CC-10)

PRACTICAL

The Practicals based on BBO E801 shall be performed.

1. Electron micrographs/Models of viruses – T-Phage and TMV, Line drawings/ Photographs of Lytic and Lysogenic Cycle.
2. Types of Bacteria to be observed from temporary/permanent slides/photographs.
3. Examination of bacteria from natural habitat (curd) by simple staining.
4. Electron micrographs of bacteria, binary fission, endospore, conjugation, root Nodule (live materials and photographs).
5. Gram staining

Plant Pathology

1. Introduction to the world of fungi (Unicellular, coenocytic/septate mycelium, asocarps & basidiocarps).
2. *Rhizopus*: study of asexual stage from temporary mounts and sexual structures through permanent slides/ photographs.
3. *Agaricus*: Specimens of button stage and full grown mushroom; sectioning of gills of *Agaricus*, and fairy rings are to be shown.
4. Phytopathology: Herbarium specimens/photographs of bacterial diseases; Citrus Canker; Viral diseases: Mosaic disease of papaya, Fungal diseases: Early and late blight of Potato, Brown spot of rice, Tikka disease of ground nut, Powdery mildew of locally available plants and White rust of crucifers, Black stem rust of wheat.

Handwritten signatures and dates:
A. S. 27/5/22
Abund
K
A. S. 27/5/2022
M. S. 27/5/22
Chink
Falpas
Perind