

## IV SEMESTER

### MBH-551: AGRICULTURAL MICROBIOLOGY

52 h

#### Unit-I

13 h

**Microbial diversity in Soil,** Qualitative and quantitative analysis of Soil microflora Rhizosphere and non-rhizosphere microorganisms and their importance. Soil- Types, Physical, chemical and Biological properties, Soil horizons and Microbial distribution. Microorganisms in nutrients recycling- Nitrogen, Sulphur, Phosphorus and Carbon cycles.

#### Unit-II

13 h

**Nitrogen fixation-** Symbiotic and Non-Symbiotic Nitrogen fixation, Biochemistry of nitrogen fixation. Phosphate solubilization, VAM- Endomycorrhizae and Ectomycorrhizae, PGPR and role in agriculture, Cyanobacteria. Biofertilizers- Microbial inoculants, *Rhizobium*, *Azospirillum*, *Azotobacter*.

#### Unit-III

13 h

**Diseases of important crop plants-** Bacterial, fungal and Viral diseases and its management, Biopesticides- *Bacillus thuringiensis*, *Bacillus papillae*, *Beauveria bassiana*, *Metarhizium anisopliae*. Bio control agent - *Trichoderma*. Genetic engineering technology for crop improvement, Harvesting, transportation and storage of Agricultural products. Global Environmental Problems Ozone depletion, UV-B, greenhouse effect, acid rain, their impact and biotechnological approaches for management. Global warming and climate change.

#### Unit-IV

13 h

**Bioremediation of Contaminated Soils,** ISI Standards and Quality tests, Nursery Inoculants, Impact of Heavy Metals on Soil Microbial communities. Biodeterioration: Definition and concept, biodeterioration of woods. Biomagnification: concept and consequences, Biomagnifications of chlorinated hydrocarbons and pesticides. Biotransformations: metals and metalloids, mercury transformations, biotransformation of pesticides such as hexachlorobenzene. Biodegradation of plastics. **Concept of phytoremediation** and applications.