

## **OPEN ELECTIVE**

### **MBE- 459: General Microbiology**

**40h**

#### **UNIT I**

**12 h**

Isolation and Identification of Microbes, Culturing of Microbes- Culture media, Types of culture media. Media for bacteria, fungi, algae and viruses. Pure culture techniques: Different types of inoculation methods - Spread plate, Pour plate and Streak plate methods. Economic importance of Microorganism: Agriculture, Industry, Medicine, Environment.

#### **Unit II**

**14 h**

Classification and general properties of microbes: Virus, Bacteria, Fungi, Algae and protozoans. Distribution of microorganisms in soil, Role of microorganisms in soil fertility. Microbial Interactions- mutualism, commensalism, competition, amensalism, parasitism, predation. Interactions between microbes and plants, Microbes and animals, Microbes and Humans.

#### **Unit III**

**14 h**

Bacterial diseases: Cholera, Typhoid, Tuberculosis, Salmonellosis, Anthrax, Shigellosis. Fungal Disease: Candidiasis, Dermatitis, Aspergillosis, Mycotoxicosis. Viral Diseases: AIDS, HIV, Rabies, Hepatitis, Poliomyelitis, Small pox, Chicken pox. Control of microbes- Sterilisation, disinfection, antiseptic, pasteurization, radiation, Chemicals-phenol and phenolic compounds.

## **MBE: 460 BIOINOCULANTS**

**40 h**

### **UNIT I**

**12 h**

Bio inoculants-definition, history and scope. Types of bio inoculants. Microbial Inoculants- types in microbial inoculants-seed, soil, nursery. Methods of inoculant preparation in seed/seedling and soil inoculants. ISI standards and quality tests followed in bioinoculants

### **UNIT II**

**14 h**

Biofertilizers- Definition & types, Biological Nitrogen fixers- symbiotic and non- symbiotic- *Gluconoacetobacter*, *Rhizobium*, *Frankia*, *Azotobacter*, *Azospirillum*, *Azolla*, Blue green alga. Phosphate solubilizers- mechanisms, examples. Phosphate Mobilizers- Mycorrhizae- Ecto and Endomycorrhizae and VAM

### **UNIT III**

**14 h**

Biopesticides- Definitions, Importance in management of crop pests-, *Verticillium*, *Metarrhizium*, *Beaveria*. Biofungicides: *Trichoderma* and its importance in Biocontrol of plant diseases. Bacterial biopesticides- *Bacillus thuringensis*, *Pseudomonas*. Production and formulation of *Rhizobium* biofertiliser

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