DETAILED SYLLABUS B.Sc. 3rd Semester (Minor-II)

Title of the Course: Plant Pathology and Microbiology
Course code: BOT-MINOR-DSE-3
Nature of the Course: Minor-3.2
Total Credits: 04
Distribution of Marks : 100 (Theory-45, Practical-25, Internal assessment-30)

Course objectives: The objective of this course is to provide knowledge to the students on various aspects plant Pathology and Microbiology

UNITS	Contents	L	T	P	Total Hours
UNIT-I Marks-20	**Plant Pathology :-** Terms and concepts; Genera symptoms of plant diseases; principles of prevention and control of plant diseases, role of quarantine. classification of diseases; Host-Pathogen relationships; Koch's postulates, aflatoxin and phytoalexin . **Plant Diseases:** Study the symptom, causal organism, disease cycle and control measure of the following diseases caused by fungus, bacteria and viruses- **Bacterial diseases:**- Citrus canker and angular leaf spot of cotton. **Viral diseases:**- Tobacco Mosaic Viruses (TMV), Bhendi Yellow Vein Mosaic virus . **Fungal diseases:**- Late blight of potato, Black stem rust of wheat, White rust of crucifers.	**13**	**2**		**15**
UNIT-II Marks-20	**Introduction to Microbial World:-** Introduction and scope of microbiology **Microorganism and diversity of life:** brief account on-*Archaebacteria, Eubacteria, Rickttsia, Chlamydiae, Actinomycetes, Mycoplasma and Speharoplasts.* **Nutritional requirement and growth of microorganism**: Nutrients, Factors affecting and influencing microbial growth, Culture media, Types of culture media. **Microbial metabolism**: Metabolism [Only an overview of microbial metabolism- the concept of anabolism (Biosynthesis) and catabolism (ATP- generating Pathways- Respiration and Fermentation- Glycolysis, Krebs cycle and Electron transport chain)].	**13**	**2**		**15**

UNIT-III Marks-12	**Viruses:-** General characteristics; classification (Baltimore), structure, replication (lytic and lysogenic cycle), Structure of viroids, prions, DNA virus (T-phage), RNA virus (TMV). Economic importance of viruses with reference to vaccine production, role in research, medicine and diagnostics, as causal organism of plant diseases. Dissemination of plant virus.	**8**	**1**		**9**
UNIT-IV Marks-8	**Bacteria:-** General Characteristics; various forms of virus, Cell structure; Nutrition; Reproduction- Vegetative and asexual reproduction, Economic importance of bacteria with reference to their role in agriculture and industry (Alcohol and Antibiotic production).	**6**			**6**
Practical Marks-25	1. Study of at least one fungal, bacterial and viral plant diseases with their symptoms and causal organism. 2. Electron micrographs/ Models of viruses- T-Phage and TMV/ Line drawings/ Photographs of Lytic and Lysogenic Cycle. 3. Types of bacteria to be observed from temporary/ permanent slides/ Photographs. Electron micrographs of bacteria, binary fission, endospore, conjugation, root nodule. 4. Gram staining. 5. Isolation of soil microflora. 6. Phytopathology: Submission of Bottle specimens, Herbarium specimens should be made of bacterial diseases, Viral diseases, Fungal diseases (Locally available). 7. Preparation of local diseases album			**15**	**15**

Total = 60 classes

Mode of Internal Assessment: -1. Sessional examination-15 marks

2. Field trip, Excursion Tour, Seminar, quiz, Home assignment- 15 marks

DETAILED SYLLABUS B.Sc. 4th Semester (Minor-II)

Title of the Course: Plant Diseases and Microbial World
Course code: BOT-MINOR-DSE-4
Nature of the Course: Minor-4.2
Total Credits: 04
Distribution of Marks : 100 (Theory-45, Practical-25, Internal assessment-30)

Course objectives: The objective of this course is to provide knowledge to the students on various aspects plant Plant diseases, bacteria and virues.

UNITS	Contents	L	T	P	Total Hours
UNIT-I Marks-20	**Plant Pathology :-** Terms and concepts; Genera symptoms of plant diseases; principles of prevention and control of plant diseases, role of quarantine. classification of diseases; Host-Pathogen relationships; Koch's postulates, aflatoxin and phytoalexin **Plant Diseases:** **Bacterial diseases:**- Study of the following bacterial diseases with their symptoms, causal organism, diseases cycle and control measure -Citrus canker and wilt disease of Tomato. **Viral diseases:**- Study of the following viral diseases with their symptoms, causal organism, diseases cycle and control measure -Tobacco Mosaic Viruses (TMV) and Cucumber Mosaic Virus (CMV) **Fungal diseases:**- Study of the following fungal diseases with their symptoms, causal organism, diseases cycle and control measure –blast disease of rice, Late blight of potato, Black stem rust of wheat, White rust of crucifers and powdery Mildew	**13**	**2**		**15**
UNIT-II Marks-20	**Introduction to Microbial World:-** Introduction and scope of microbiology **Microorganism and diversity of life:** Brief account on-*Archaebacteria, Eubacteria, Rickttsia, Chlamydiae, Actinomycetes, Mycoplasma and Speharoplasts.* **Nutritional requirement and growth of microorganism**: Nutrients, Factors affecting and influencing microbial growth, Culture media, Types of culture media. **Microbial metabolism**: Metabolism [Only an overview of microbial metabolism- the concept of anabolism (Biosynthesis) and catabolism (ATP- generating Pathways- Respiration and Fermentation- Glycolysis, Krebs cycle and Electron transport chain)].	**13**	**2**		**15**

UNIT-III Marks-12	**Viruses:-** General characteristics; classification (Baltimore), structure, replication (lytic and lysogenic cycle), Structure of viroids, prions, DNA virus (T-phage), RNA virus (TMV). Economic importance of viruses with reference to vaccine production, role in research, medicine and diagnostics, dissemination of plant virus.	**8**	**1**		**9**
UNIT-IV Marks-8	**Bacteria:-** General Characteristics; various forms of bacteria, Cell structure; Nutrition; Reproduction- Vegetative and asexual reproduction, Economic importance of bacteria with reference to their role in agriculture and industry (Alcohol and Antibiotic production).	**6**			**6**
Practical Marks-25	1. Study of at least one fungal, bacterial and viral plant diseases with their symptoms and causal organism. 2. Gram staining of bacterial 3. Preparation of culture media- Potato Dextrose Agar Media (PDA) 4. Electron micrographs/ Models of viruses- T-Phage and TMV, Photographs of Lytic and Lysogenic Cycle. 5. Types of bacteria to be observed from temporary/ permanent slides or Electron micrographs of bacteria, binary fission. 6. Phytopathology: Submission of Bottle specimens, Herbarium specimens should be made of bacterial diseases, Viral diseases, Fungal diseases (Locally available). 7. Preparation of local diseases album			**15**	**15**

Total = 60 classes

Mode of Internal Assessment: -1. Sessional examination-15 marks
2. Field trip, Excursion Tour, Seminar, quiz, Home assignment- 15 marks