Part A: Introduction				
Program: **Certificate course in Microbial Techniques and Archaegoniate identification**		Class: **B.Sc.I Year**	Year: **2022**	Session:**2022-2023**
1.	Course Code	**BOT-1T**		
2.	Course Title	**Microbial Diversity and Plant Pathology**		
3.	Course Type	**Theory**		
4.	Pre-requisite (if any)	NO		
5.	Course Learning. Outcomes (CLO)	At the end of this course, the students will be able to • Understand the Viruses, Bacteria, Phycology, Mycology and Plant pathology • Learn microbial techniques which will be beneficial for agriculture and industry. • Learn life cycles of selected genera of different groups • Understand etiology of plant diseases • Apply their knowledge in the crop fields to eradicate or avoid the diseases • Apply different biofertilizers to enhance productivity		
6.	**Credit Value**	**Theory: 4**		
7.	**Total Marks**	**Max. Marks: 50**	**Min Passing Marks: 17**	

Part B: Content of the Course		
Total Periods: 60		
Unit	**Topics**	**No. ofPeriod**
I	**Microbial Techniques & instrumentation:** Microscopy – Light, phase contrast, scanning and transmission electron microscopy, staining techniques for light microscopy. Common equipment of microbiology lab and principle of their working – autoclave, oven, laminar air flow, centrifuge, colorimetry, spectrophotometry, electrophoresis, immobilization methods, fermentation and fermenters.	12
II	**Microbial world:** Cell structure of Eukaryotic and prokaryotic cells, Gram positive and Gram-negative bacteria, Structure of bacteria; Bacterial Growth curve, factors affecting growth of microbes; Sporulation, reproduction, recombination in bacteria. Viruses, general characteristics, Structure of viruses, Bacteriophages and TMV; Lytic and Lysogenic cycles, viroid, Prions & mycoplasma, phytoplasma, actinomycetes and their economic uses. **Applied Microbiology:** Food fermentations and food produced by microbes, Production of antibiotics, enzymes, alcoholic beverages, Lactic acid and Acetic acid production. Antigen, antibody and production of monoclonal antibodies (Hybridoma techniques).	12
III	**Phycology:** General characteristic features, classification and range of thallus organization. Classification and life cycle of –*Volvox, Oedogonium, Chara, Vaucheria,Ectocarpus* and *Polysiphonia*. Economic importance of algae - Role of algae in soil fertility, algae as biofertilizer , blue green algae and nitrogen economy of soil; algae as biofuel	12

for 13.6.22

Course outcome B.sc 2nd year 2023-24

1. Learn about the taxonomy of plants & various classification systems.
2. Knowledge about the ethanobotnical products & various economic plants in human economy & wealth.
3. Information about the cytology & embryological features of an angiosperm plants.
4. Provide the information about ecology, different factors & various physiological features inside the plant cells.
5. Plant hormones nature regulations in the plant cells & also various activities regarding plant life cycle & movements regarding various fluctuations of environment.

B.Sc. Final year 2023-24

Course outcome :-

1. Information about various biological instruments and concepts about their practical applications.
2. Informs about the various fields of plant tissue culture & microscopy.
3. General information about plant pathology & control measures of different plant diseases.
4. Awareness about the environmental conservation & effect of pollutions on earth & importance of biostatistics in botany.
5. Information about the cytology , general genetics and biotechnology applications regarding plant cells.
6. Concept of enzymes ,enzyme action, biomolecules stereochemistry & metabolism