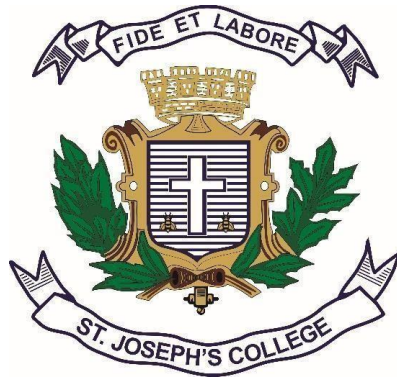


**ST JOSEPH'S UNIVERSITY  
BENGALURU-27**



**Re-accredited with 'A++' GRADE with 3.79/4 CGPA by NAAC Recognized by  
UGC as College of Excellence**

**BOTANY SYLLABUS**

**FOR UNDERGRADUATE PROGRAMME - CBZ  
(AS PER SEP 2024-25)**

## SUMMARY OF CREDITS IN BOTANY

### DEPARTMENT OF MICROBIOLOGY (UG)

(2024-2027)

<b>Semester 1</b>	<b>Code Number</b>	<b>Title</b>	<b>No. of Hours of Instructions</b>	<b>Number of Hours of teaching per week</b>	<b>Number of credits</b>	<b>Continuous Internal Assessment (CIA) Marks</b>	<b>End Semester Marks</b>	<b>Total marks</b>
Theory	BO1124	Microbiology, Mycology and Plant Pathology	45	03	03	40	60	100
Practical	BO 1P1	Microbiology, Mycology and Plant Pathology	33	03	02	25	25	50
<b>Total Number of credits:</b>			<b>05</b>					
<b>Semester 2</b>	<b>Code Number</b>	<b>Title</b>	<b>No. of Hours of Instructions</b>	<b>Number of teaching Hrs /week</b>	<b>Number of credits</b>	<b>Continuous Internal Assessment (CIA) Marks</b>	<b>End Semester Marks</b>	<b>Total marks</b>
Theory	BO 2124	Phycology and Bryology	45	03	03	40	60	100
Practical	BO 2P1	Phycology and Bryology	33	03	02	25	25	50
<b>Total Number of credits:</b>			<b>05</b>					

**BO1124: Microbiology, Mycology and Plant Pathology**

<b>Units</b>	<b>Title of Contents</b>	<b>Hrs (45)</b>
<b>UNIT 1</b>	<b>History and developments of microbiology</b> - Microbiologists and their contributions (Leeuwenhoek, Louis Pasteur, Robert Koch, Edward Jenner and Alexander Fleming).	<b>2</b>
<b>UNIT 2</b>	<b>Microscopy</b> – <i>History of microscopy (self study)</i> . Components, working principle and applications of light ( <i>simple and compound</i> ) ( <i>self study</i> ) and electron microscopes(SEM and TEM).	<b>3+2</b>
<b>UNIT 3</b>	<b>Culture media for Microbes</b> - <i>Natural and synthetic media, Routine media -basal media, enriched media, selective media, indicator media, transport media, and storage media (Self study)</i>	<b>2</b>
<b>UNIT 4</b>	<b>Sterilization methods</b> - Principle of disinfection, antiseptic and Pasteurization, Sterilization - Sterilization by dry heat, moist heat, UV light, ionization radiation,filtration. Chemical methods of sterilization - phenolic compounds, anionic and cationic detergents.	<b>4</b>
<b>UNIT 5</b>	<b>Viruses</b> - General structure and classification based on Nucleic acids (ssDNA, dsDNA, ssRNA, and dsRNA). Structure and multiplication of TMV.	<b>3</b>
<b>UNIT 6</b>	<b>Bacteria</b> – General account on Archaeobacteria and Eubacteria. General characteristics and classification of bacteria based on shape and flagellation. Ultrastructure of Bacteria - Structure of capsule, flagella, pili and endospore. (Ultrastructure of flagella and endospore only), Physical and chemical structure of Gram positive and Gram-negative bacterial cell walls. Reproduction by binary fission. Genetic recombination by conjugation (F+ and F-, Hfr types), Transduction (generalized and specialized types) and Transformation. <i>Economic importance of Bacteria (Industry, agriculture and Medicine) – (Self study)</i>	<b>13+1</b>
<b>UNIT 7</b>	<b>Fungi</b> - General characteristics and thallus organization and nutrition in fungi. Reproduction in fungi (asexual and sexual). Type study of; <i>Pythium, Rhizopus, Puccinia</i> and <i>Penicillium</i> . <i>Economic importance of fungi (Industry, agriculture and medicine) – Self study</i> <b>Lichens</b> – Structure, types and reproduction.	<b>9+1</b>
<b>UNIT 8</b>	<b>Plant Pathology</b> – Brief account of the following diseases: Tomato Leaf Curl, Citrus Canker, Sandal Spike, Club Root of Crucifer, Smut of Jowar, Blast of Rice, Red Rot of Sugarcane.	<b>5</b>

**BO 1P1: Microbiology, Mycology and Plant Pathology****11 Sessions – 3 Hours/ Week**

Sl. No.	Experiments	Units/ Sessions
1	Safety measures in microbiology laboratory and study of equipment/appliances used for microbiological studies (Microscopes, Hot air oven, Autoclave/Pressure Cooker, Inoculation needles/loop, Petri plates, Incubator, Laminar flow hood, Colony counter).	1
2	Preparation of culture media (NA/PDA) sterilization, inoculation. Enumeration of soil/water microorganisms by serial dilution technique.	1
3	Gram's staining of bacteria	1
4	Determination of cell count by using Haemocytometer.	1
5	Determination of microbial cell dimension by using Micrometer.	1
6	Study of vegetative structures and reproductive structures – <i>Stemonitis, Pythium, Rhizopus</i>	1
7	Study of vegetative structures and reproductive structures- <i>Puccinia, Penicillium</i>	1
8	Study of vegetative structures and reproductive structures- <i>Trichoderma</i> and <i>Agaricus</i>	1
9	Study of Tomato Leaf Curl, Citrus Canker, Sandal Spike, Club Root of Crucifer.	1
10	Study of Smut of Jowar, Blast of Rice, Red Rot of Sugarcane and Tikka disease of Groundnut. Revision.	2

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**BO 2124 – Phycology and Bryology**  
**(I B.Sc., II Semester, CBZ)**

Units	Title of Contents	Hours (45)
<b>UNIT 1</b>	<p><b>Algae – General concepts</b> Diversity of Algae with respect to habitat, thallus organization and reproduction. <u>Classification of algae (upto classes) by Fritsch (self study).</u> Life cycle types in algae: Haplontic, diplontic, haplodiplontic, haplobiontic and diplobiontic types.</p>	10 + 2
<b>UNIT 2</b>	<p><b>Algae – Type study</b> Systematic position, structure and reproduction of the following forms: <i>Anabaena</i>, <i>Volvox</i>, <i>Spirogyra</i>, <i>Chara</i>, <i>Vaucheria</i>, <i>Sargassum</i>, <i>Batrachospermum</i>.</p>	9
<b>UNIT 3</b>	<p><u>Economic importance of algae including harmful and useful effects in ecosystems.</u> <u>(self study).</u></p>	2
<b>UNIT 4</b>	<p><b>Bryophytes – General concepts</b> Bryophytes: Distribution, general characters, alternation of generation and classification of Bryophytes by Proskauer (1957).</p>	4
<b>UNIT 5</b>	<p><b>Bryophytes – Type study</b> Morphology, anatomy and reproduction of <i>Marchantia</i>, <i>Anthoceros</i> and <i>Sphagnum</i> (developmental details not required).</p>	7
<b>UNIT 6</b>	<p>Origin and phylogenetic relationships between algae and bryophytes.</p>	2
<b>UNIT 7</b>	<p>Ecology of Bryophytes. Bryophytes in a changing world – impact of pollution on bryophytes, application to bioindication, adaptation to a changing environment. Conservation biology for algae and bryophytes – threats, need for conservation and conservation strategies. Role of peat in soil less plant growth.</p>	7
<b>UNIT 8</b>	<p><u>Economic importance of Bryophytes (self-study).</u></p>	2

## BO 2P1: Phycology and Bryology

11 Sessions – 3 Hours/ Week

Sl. No.	Experiments	Units/ Sessions
1	Type study of <i>Anabaena</i> , <i>Scytonema</i> , <i>Spirulina</i>	1
2	Type study of <i>Volvox</i> , <i>Hydrodictyon</i>	1
3	Type study of <i>Spirogyra</i> , <i>Chara</i> , <i>Vaucheria</i>	1
4	Type study of <i>Sargassum</i> , <i>Batrachospermum</i>	1
5	Type study of <i>Marchantia</i>	2
6	Type study of <i>Anthoceros</i>	1
7	Type study of <i>Funaria</i>	1
8	Type study of <i>Sphagnum</i>	1
9	Type study of Isolation of algae from water samples by serial dilution method	1
10	Institutional visit to study culturing of microalgae	1

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