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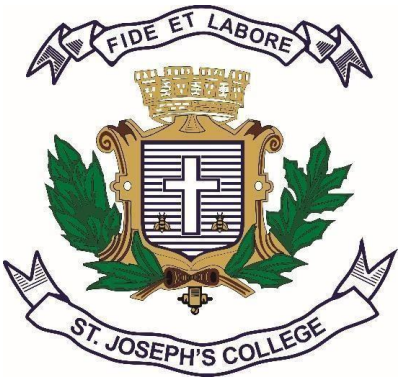

Re-accredited with 'A++' GRADE with 3.79/4 CGPA by NAAC Recognized by UGC as College of Excellence

BOTANY SYLLABUS

FOR UNDERGRADUATE PROGRAMME - CBBt
(AS PER SEP 2024-25)

SUMMARY OF CREDITS IN BOTANY

DEPARTMENT OF MICROBIOLOGY (UG) (2024-2027)								
Semester 1	**Code Number**	**Title**	**No. of Hours of Instructions**	**Number of Hours of teaching per week**	**Numb er of credits**	**Continuous Internal Assessment (CIA) Marks**	**End Semester Marks**	**Total marks**
Theory	BO1224	Virology, Bacteriology, Mycology and Phytopathology	45	03	03	40	60	100
Practical	BO 1P1	Virology, Bacteriology, Mycology and Phytopathology	33	03	02	25	25	50
Total Number of credits:			**05**					
Semester 2	**Code Number**	**Title**	**No. of Hours of Instructions**	**Number of teaching Hrs /week**	**Number of credits**	**Continuous Internal Assessment (CIA) Marks**	**End Semester Marks**	**Total marks**
Theory	BO 2224	Applied Phycology and Bryophytes	45	03	03	40	60	100
Practical	BO 2P1	Applied Phycology and Bryophytes	33	03	02	25	25	50
Total Number of credits:			**05**					

BO1224: Virology, Bacteriology, Mycology and Phytopathology

Units	Title of Contents	Hrs (45)
UNIT 1	**Virology:** General structure and Baltimore classification. Replication in Viruses: Lytic cycle (T2 phage) and Lysogenic cycle (lambda phage). Structure and multiplication of TMV and CaMV. *Brief account of Viroids and Prions (Self study).*	7+*1*
UNIT 2	**Bacteriology:** General account on Archaebacteria 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. *Economic importance of Bacteria (Industry, agriculture and Medicine) - (Self study).*	11+*1*
UNIT 3	**Mycology:** General characteristics and thallus organization and nutrition in fungi. Reproduction in fungi (asexual and sexual). Type study of; *Pythium*, *Rhizopus*, *Puccinia*, *Peziza* and *Penicillium*. *Economic importance of fungi (Industry, agriculture and medicine) - (Self study).* **Lichens** – Structure, Classification and reproduction. *Economic importance of lichens - (Self study).*	13+*2*
UNIT 4	**Phytopathology:** *Introduction, brief history and classification based on symptoms - (Self study).* 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.	8+*2*

BO 1P1: Virology, Bacteriology, Mycology and Phytopathology

11 Sessions – 3 Hours/ Week

Sl. No.	Experiment	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 – *Stemonitis*, *Pythium*, *Rhizopus*	1
7	Study of vegetative structures and reproductive structures- *Puccinia*, *Penicillium*	1
8	Study of vegetative structures and reproductive structures- *Trichoderma* and Peziza	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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20. Schlegel HG. 1986. General Microbiology. Cambridge. University Press. London, 587pp.
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BO 2224 – Applied Phycology and Bryophytes
(I B.Sc., II Semester, CBBT)

Units	Title of Contents	Hours (45)
UNIT 1	**Algae – General concepts** Diversity of Algae with respect to habitat, thallus organization and reproduction. *Classification of algae (upto classes) by Fritsch (self study).*	**5 + *2***
UNIT 2	**Algae – Type study** Systematic position, structure and reproduction of the following forms: *Anabaena, Volvox, Spirogyra, Vaucheria, Sargassum, Batrachospermum*.	**7**
UNIT 3	**Bryophytes – General concepts** Bryophytes: Distribution, general characters, alternation of generation and classification of Bryophytes by Proskauer (1957).	**4**
UNIT 4	**Bryophytes – Type study** Morphology, anatomy and reproduction of *Marchantia, Anthoceros and Sphagnum* (developmental details not required).	**6**
UNIT 5	Origin and phylogenetic relationships between algae and bryophytes.	**3**
UNIT 6	Algal immobilization and its applications, Blue-green algal bio-fertilizer: Method of preparation (Trough/ Tank method, Pit method). Applications and advantages of biofertilizers over inorganic fertilizers	**3**
UNIT 7	Fuels- Renewable and Non – renewable. Algal biodiesel; Cultivation and extraction methods. *Advantages over other sources of biodiesel (Self study)*	**2 + *1***
UNIT 8	*Algae as water quality indicators; Algal blooms-causes and effects (Self study)*	***2***
UNIT 9	Bioactive compounds from bryophytes: phytochemicals from bryophytes and their bioactivity. Pharmacological activity of bryophytes - antimicrobial activity, antifungal activity, cytotoxic activity, antioxidant activity *Bioactive ingredients from Bryophytes for the cosmetic industry (self study).*	**3 + *1***
UNIT 10	Bryophytes in a changing world – impact of pollution on bryophytes, application to bioindication, adaptation to a changing environment. Stress tolerance in bryophytes. Conservation biology for algae and bryophytes – threats, need for conservation and conservation strategies. Role of peat in soil less plant growth.	**6**

BO 2P1: Applied Phycology and Bryophytes

11 Sessions – 3 Hours/ Week

Sl. No.	Experiment	Units/ Sessions
1	Type study of *Anabaena, Scytonema, Volvox*	1
2	Type study of *Spirogyra, Chara, Vaucheria*	1
3	Type study of *Sargassum, Batrachospermum*	1
4	Type study of *Marchantia*	2
5	Type study of *Anthoceros*	1
6	Type study of *Funaria*	1
7	Isolation of algae from water samples by serial dilution method	1
8	Demonstration of algal culture using Chu10 medium	1
9	Extraction and separation of photosynthetic pigments from an algal sample	1
10	Institutional visit to study culturing of microalgae	1

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