

LESSON PLAN SUBJECT: BOTANY (Theory) SEMESTER- IV , PAPER: BOTN4011 - Botany (Theo): Phycology		
Unit	TOPIC	Teacher
Unit 1: Algae	Definition and position of algae in plant kingdom, Basic criteria of classification of algae, Range of thallus organization; Cell structure and components; cell wall, pigment system, reserve food (of only groups represented in the syllabus), flagella; Life cycle patterns, methods of reproduction; general concept of endosymbiosis, classification of Lee (2018); contributions of F.E. Fritsch & M.O.P. Iyengar; Role of algae in the environment, agriculture, biotechnology, food and industry.	Mr. Subir Kumar Samanta
Unit 2: Cyanophyta and Xanthophyta	Ecology and occurrence, Cell structure, Heterocyst structure and function. Ecology and occurrence, Cell structure, Heterocyst structure and function. Morphology and life cycle of <i>Oscillatoria</i> , <i>Anabaena</i> , <i>Scytonema</i> , <i>Vaucheria</i> .	Dr. Sayani Biswas
Unit 3: Chlorophyta and Charophyta	General characteristics, occurrence, Cell Structure, life cycle of <i>Volvox</i> , <i>Oedogonium</i> , <i>Coleochaete</i> , <i>Chara</i> . Bacillariophyceae—Cell structure, Reproduction with special emphasis on auxospore formation, Ecology and economic significance	Mr. Subir Kumar Samanta
Unit 4: Phaeophyta	General characteristics, occurrence, Thallus structure and tissue organization, Cell structure, Reproduction, life cycle of <i>Ectocarpus</i> , <i>Fucus</i> , Ecology and economic significance.	Dr. Sayani Biswas
Unit 5: Rhodophyta	Characteristic; Cell structure, reproduction including post-fertilization changes, ecology and economic significance: Lifecycle pattern of <i>Batrachospermum</i>	Mr. Subir Kumar Samanta

LESSON PLAN SUBJECT: BOTANY (Practical) SEMESTER- IV , PAPER: BOTN4011 - Botany: Phycology		
Sl. No.	TOPIC	Teacher
1.	Workout and identification of vegetative and reproductive structures of <i>Oscillatoria</i> , <i>Scytonema</i> , <i>Rivularia</i> , <i>Gloeotrichia</i> , <i>Zygnema</i> , <i>Oedogonium</i> , <i>Cladophora</i> , <i>Chara</i> , <i>Vaucheria</i> , <i>Ectocarpus</i> and, <i>Batrachospermum</i> .	Mr. Subir Kumar Samanta
2.	Identification of all the genera included in the theoretical syllabus from Permanent slides (vegetative and reproductive structures).	Dr. Sayani Biswas

LESSON PLAN SUBJECT: BOTANY (Theory) SEMESTER- IV , PAPER: BOTN4012 - Botany (Theo): Mycology		
Unit	TOPIC	Teacher
Unit 1: Introduction	General characteristics; Affinities with plants and animals; Thallus organization; Cell wall composition; Nutrition; Classification of Alexopoulos & Mims, 1979 (up to order), symbiotic association, Lichen, Mycorrhizae-basic concept and their significance.	Dr. Manjusha Sarkar
Unit 2: Chytridiomycota and Zygomycota	Characteristic features; Thallus organization; Life cycle of <i>Synchytrium</i> .	Dr. Manjusha Sarkar

Unit 3: Ascomycota	General characteristics, sexual reproduction and development of ascus and ascospores, types of ascocarps; Phenomenon of heterokaryosis and parasexuality in asexual members; Life cycle of <i>Talaromyces</i> , <i>Ascobolus</i> , <i>Aspergillus</i> .	Dr. Manjusha Sarkar
Unit 4: Basidiomycota	General characteristics; Phenomenon of dikaryotization, development of basidia and basidiospores and basidiocarps, Life cycles of <i>Polyporus</i> sp., <i>Puccinia</i> sp., and <i>Ustilago</i> sp.; Bioluminescent fungi, Fairy Rings and Mushroom Cultivation (brief idea).	Mr. Sujit Pal
Unit 5: Deuteromycota	General characteristics, asexual reproduction, fruiting structures, studies on the genera <i>Fusarium</i> and <i>Alternaria</i> .	Mr. Sujit Pal
Unit 6: Allied Fungi	General characteristics; Status of Slime molds, Occurrence; Types of plasmodia.	Mr. Sujit Pal
Unit 6: Oomycota	General characteristics; Life cycle of <i>Phytophthora</i> and <i>Albugo</i> .	Mr. Sujit Pal
Unit 8: Applied Mycology	Role of fungi in biotechnology; Application of fungi in food, flavor, and leather industry, Fermentation, Organic acids, Enzymes, Mycoproteins; Secondary metabolites, pharmaceutical preparations with reference to penicillin; Agriculture (Biofertilizers); Biological control and overview of biocontrol agents.	Dr. Manjusha Sarkar

LESSON PLAN SUBJECT: BOTANY (Practical) SEMESTER- IV , PAPER: BOTN4012 - Botany (Theo): Mycology		
Sl. No.	TOPIC	Teacher
1.	Study of the following genera and their identification: <i>Rhizopus</i> , <i>Penicillium</i> , <i>Alternaria</i> , <i>Ascobolus</i> , <i>Agaricus</i> and <i>Polyporus</i> .	Dr. Manjusha Sarkar
2.	Identification of all the macroscopic and microscopic genera included in the theoretical syllabus.	Mr. Sujit Pal

LESSON PLAN SUBJECT: BOTANY (Theory) SEMESTER- IV , PAPER: BOTN4013 - Botany (Theo): Plant Pathology		
Unit	TOPIC	Teacher
Unit 1: Plant pathology:	A brief history of plant pathology in India and losses caused by pathogens and pests; Types of pathogens, signs and symptoms, symptoms of different plant diseases. Inoculum potential, survival and longevity of inoculum, inoculum production, plant quarantine, Koch's postulates.	Dr. SK Aftabul Alam
Unit 2: Plant microbe interaction:	Molecular basis of host recognition, entry, pre-penetration, penetration and post penetration events, pathogenesis; Dissemination of pathogens: Means of dissemination (active and passive dissemination)	Dr. Jiban Kumar Pal
Unit 3: Host parasite interaction	Unit 3: Host parasite interaction: Concept of compatibility and specificity, gene for gene hypothesis, genetics of resistance- vertical and horizontal resistance, source of resistance. Enzymes and toxins- a brief idea on their role in pathogenesis	Dr. Jiban Kumar Pal
Unit 4: Disease resistance	(i) Plant defense (structural and biochemical defense), with special reference to polyphenols and phytoalexins. Genetic resistance: biotechnological approaches for transfer of R- genes into susceptible plants. General idea on seed borne pathogens, market disease of fruits and vegetables. Disease control: Cultural practices, physical control, chemical control and biological control.	Dr. Jiban Kumar Pal
Unit 5:	Brief account, structure, importance, disease cycle and control of the following: black rust of wheat, loose smut of wheat, white rust of Amaranthus, early blight and late blight of potato, brown spot of rice, powdery mildew of cucurbits.	Dr. SK Aftabul Alam

LESSON PLAN
SUBJECT: BOTANY (Practical)
SEMESTER- IV , PAPER: BOTN4013 - Botany (Theo): Plant Pathology

Sl. No.	TOPIC	Teacher
1	Identification of diseases prescribed in the theoretical syllabus.	Dr.SK Aftabul Alam
2	.Workout of the following diseases: Late blight of potato, White rust of Amaranthus, Rust of wheat/Justicia, loose smut of wheat, powdery mildew of cucurbits, shot hole of Basella.	Dr.Jiban Kumar Pal
3	. Study of herbarium and museum specimens of bacterial, fungal, and viral diseases-(Citrus Canker,bacterial blight of rice, Fusarial wilt of tomato, tikka disease of ground nut, loose and cover smut of wheat, TMV, Vein clearing of legumes.	Dr.SK Aftabul Alam
4.	. Mycorrhizae-Ecto and Endo mycorrhizae (photographs only)	Dr.SK Aftabul Alam