Savitribai Phule Pune University

Satyaniketan's

Adv. M.N.Deshmukh Arts, Science & Commerce College Rajur

M. Sc. I and M. Sc. II

BOTANY

SEMISTER I and III

TEACHING PLAN

(2023-24)

Submitted By

Mr. Shinde Somnath Salu

Department of Botany

Satyaniketan's

Adv.M.N.Deshmukh Arts, Science and Commerce College Rajur

Tal. Akole, Dist. Ahmednagar. Pin. 422604.

M.Sc. - I (Botany), Semester I

(For Colleges Affiliated to Savitribai Phule Pune University)

Unit Planning (2023-24)

BOT 501 MJ: Botany Theory Paper I
Plant Taxonomy - I (Algae and Fungi)

Mr. Shinde Somnath Salu

Sr.No	Month	Topics	Lecture
Credit-I: ALGAE			
1.	September	Introduction and general characters of algae, Contribution of Indian Phycologist	02
2.	September	Classification of Algae	02
3.	September	Salient features of major groups of algae, Prokaryotic algae (Cyanophyta / cyanobacteria)	02
4.	September	Eukaryotic algae Chlorophyta, Charophyta, Euglenophyta, Bacillariophyta, Phaeophyta, Rhodophyta	04
5.	October	Status of Indian seaweed resources, algal based industries in India; Seaweeds - marine algal farming and its applications.	02
6.	October	Role of Algae in biofuel, agriculture, nutraceuticals, pharmaceuticals and biomedical industries and its applications, Algae as water quality indicator; concept and control measures of algal blooms, Red tide and algal toxins.	03

Sr.No	Month	Topics	Lecture
Credit-II FUNGI			
7.	October	Basics of Mycology, The status of Kingdom-Fungi. Principles of important systems of classification of Fungi up to the rank of classes of Lichenized and Non-Lichenized fungi.	02
8.	October	Classification Systems, Fungal Groups, Classification up to the rank of orders	03
9.	October	Range of structure and organization of vegetative and reproductive bodies, Methods of reproduction, Life-cycle.	02
10.	November	Standard keys for identification of major groups and method of preparation of artificial keys for fungal identification.	01
11.	November	Nutritional in fungi, Overview of Economically and Industrially important fungi (Food and Feed, Biocontrol, Medicine, Alcohol, Bioremediation etc.).	02
12.	November	Lichenized fungi, General account of lichens with special, Habitat, Structure and organization of lichens, Method of reproduction	01
13.	November	Physiological relationship of mycobiont and phycobiont. Helotism, Key for identification of lichenized fungi, Economic importance of lichens, Mycorrhizae: Types and importance	02
14.	November	Fungal bioprospecting, Biocontrol, Fungal databases and its use. Steps in preparation of Fungi (Fungal Flora). New trends in fungal classification as per International Code of Nomenclature (ICN) for Algae, Fungi, and Plants and Paleo-mycology.	03

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BOT 502 MJ: Botany Theory Paper II
Plant Taxonomy - I (Bryophytes and Pteridophytes)

Mr. Shinde Somnath Salu

Sr.No	Month	Topics	Lecture
Credit-I: BRYOPHYTES			
1.	September	Introduction, Origin, and General Characteristics, Affinities with Thallophytes and Pteridophytes. Distribution, Habitat, and Life cycle.	02
2.	September	Reproduction and Classification	02
3.	September	Salient features of major groups of Bryophytes, Distribution, Morphology, Anatomy and Reproduction	02
4.	September	a) Marchantiales b) Sphaerocarpales c) Calobryales,	03
5.	September & October	d) Anthcerotales, e) Sphagnales, f) Funariales, g) Takakiales	03
6.	October	Adaptations to Land Habit, Amphibians of Plant Kingdom, Apogamy, Apospory and Heterospory, Rhizoids and Scales, Evolution of Sporophyte, Theory of sterilization and reduction. 6. Economic and Ecological importance	03

Sr.No	Month	Topics	Lecture
Credit-II PTERIDOPHYTES			
7.	October	Introduction and General characteristics of Pteridophytes, Asporous, Heterosporous, Stele and sori evolution, Seed habit, Fossil Pteridophytes and Ethnobotanical importance.	02
8.	October	Classification Systems, Psilopsida	02
9.	October	Distribution, General characteristics, Morphology, anatomy, and reproduction of Psilopsida, Life cycle study of Psilotum	02
10.	November	Lycopsida: Distribution, General characteristics, Morphology, anatomy, and reproduction of Lycopsida; Life cycle study of Selaginella	03
11.	November	Sphenopsida Distribution, General characteristics, Morphology, anatomy, and reproduction of Sphenopsida; Life cycle study of Equisetum.	03
12.	November	Pteropsida: Distribution, General characteristics, Morphology, anatomy, and reproduction of Pteropsida; Life cycle study of Pteris.	03.

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Unit Planning (2023-24)

BOUT 232 Botany Theory Paper 2
(Developmental Botany)

Mr. Shinde Somnath Salu

Sr.No	Month	Topics	Lecture
Credit I: Basic concepts of Plant development (15L)			
1.	July	1. Potency, commitment, specification, induction, competence, determination and differentiation; morphogenetic gradients; cell fate and cell lineages; stem cells; genomic equivalence and the cytoplasmic determinants; imprinting; mutants and transgenics in analysis of development,	07
2.	July	2. Polarity & Symmetry	02
3.	August	3. Difference between Plant and Animal development	02
4.	August	4. Factors for development- intrinsic and extrinsic	02
5.	August	5. Juvenility -Characteristics,Transition to Adult phase.	02
Credit II: Embryology (15L)			
6.	August	1. Reproductive structure in plant 2. Gametophyte development- Stamen and Microsporogenesis, Male gametophyte or male germ unit development, Carpel and Megasporogenesis, Female gametophyte or female germ unit development	05

Sr.No	Month	Topics	Lecture
7.	August	3. Fertilization-Pollen tube growth and its path,it sentry into embryo sac, gametic fusion, significance of double fertilization, abnormalities in fertilization.	02
8.	August	4. Development of embryo in dicots and monocot	02
9.	September	5. Development of Endosperm	02
10.	September	6. Polyembryony- concept and classification of polyembryony, special cases and causes of polyembryony.	02
11.	September	7. Apomixis - concept, categories- agamospermy and vegetative reproduction apospory, parthenogenesis	02
Credit III: Physiological & Molecular Basis of Plant Development (15L)			
12.	September	1. Physiology of plant development - Photo-morphogenesis, Light mediated development, Photoreceptors, Hormonal Signaling in development	04
13.	September	2. Molecular and Cellular Events in – a. Embryogenesis b. Leaf development	03
14.	September	c. Stomatal development d. Root development	04
15.	October	e. Root Hair Development f. Shoot development	04
Credit IV: Molecular and Cellular Events in – 15L			
16.	November	g. Inflorescence development	02
17.	November	h. Flower development	05
	November	3. Mutants in Developments	
18.	November	4. Genetic and Epigenetic Mechanisms Underlying Vernalization	04
19.	November	5. Radial and Axial Pattern of development 2L 6. Process of Senescence	04

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Unit Planning (2023-24)
BOUT 234: f) Seed science

Mr. Shinde Somnath Salu

Sr.No	Month	Topics	Lecture
Credit-I			
1.	August	Introduction, Scope, Importance and Definition of Seed Technology	02
2.	August	Seed, Definition, Difference between seed and grain, Orthodox and Recalcitrant seed, Classes of seed, Seed quality characteristics	04
3.	August	Seed Morphology, Seed structure (embryo, endosperm and seed coat), Chemical composition of seed (carbohydrates, proteins, oils, fats and other)	03
4.	September	Seed Dormancy and Seed Germination, Definition of dormancy ,Types of dormancy,Causes of seed dormancy.	03
5.	September	Methods of breaking dormancy, Definition of seed germination ,Types of germination, Factors affecting seed germination, Seed vigour, Seed ageing and Seed viability,	03
6.	September	Genetic Purity, GOT (grow out test). Germination testing, its methods (paper, sand and soil), evaluation and reporting of results	02

Sr.No	Month	Topics	Lecture
Credit-II			
7.	September	Genetic Purity, GOT (grow out test). Germination testing, its methods (paper, sand and soil), evaluation and reporting of results	02
8.	October	Quality testing, Moisture testing: Moisture Meter and Air oven method, Physical purity analysis, Biochermical tests (Quick viability test (Tz), Peroxidase and Phenol colour test), Aids for varietal identification: PCR, RAPD, RFLP, DNA finger printing, ELISA test.	03
9.	October	Seed Production, General Principles of seed production, Artificial pollination (Hand pollination, Dusting and Honey bee), Seed production techniques in hybrids (use of Male Sterility, Self Incompatability and gametocides)	04
10.	October	Procedure of seed production in tomato, okra, soybean, cotton and maize (Land requirements, isolation requirements, brief cultural practices, plant protectionphysical, chemical and biological.	02
11.	October	Types of chemical pesticides-systemic and contact, roguing, harvesting and threshing), True potato seed (TPS), Artificial Seed Production.	02
12.	Novmber	. Seed Testing, Objectives and Definition, ISTA, CSTL and SSTL, Seed Sampling: Definition, Sampling, Dividing and Mixing equipments, Procedure of sampling, (Kinds-Primary, composite, submitted and working), Types of seed samples (Service, official and certification sample)	04