

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

Miss. Kondar Prachi Sharad

Department of Botany

Satyaniketan's
Adv.M.N.Deshmukh Arts, Science and Commerce College Rajur
 Tal. Akole, Dist. Ahmednagar. Pin. 422604.

M.Sc. (Botany) Part-I, Semester I
 (For Colleges Affiliated to Savitribai Phule Pune University)

Unit Planning (2023-24)

BOT 503 MJ : Botany Theory Paper- plant physiology

Miss. Kondar Prachi Sharad

Sr.No	Month	Topics	Lecture
Credit-I: Unit 1: photosynthesis			15
1.	July	Light harvesting complexes (Reaction center, antenna pigments), , RUBISCO activity, C4 and CAM cycle, Photorespiration	04
2.	July & August	mechanism of electron transport, Kok curve, Kautsky curve, C3 cycle, RUBISCO activity, C4 and CAM cycle, Photorespiration	04
Unit 2: Respiration			7L
3.	August	Glycolysis, Citric acid cycle (Krebs cycle), ,	03
4.	August	Respiratory Electron Transport System (ETS) and ATP synthesis,	02
5.	August	, alternate oxidase, Gluconeogenesis, Pentose Phosphate Pathway, Hexose Monophosphate Shunt, Cyanide Resistant Pathway.	02
Credit –II Unit I: Translocation of organic solutes			15 L
6.	September	Source and Sink relationship, Loading and unloading of phloem and mechanism of transport of solutes (Munch hypothesis).	03
Unit II: Stress physiology			
7.	October	Definition, Types, Response of plants to biotic (pathogen and insect) and abiotic (drought, Salinity	04

Sr.No	Month	Topics	Lecture
Unit III: Plant hormones			
8.	Oct	Biosynthesis, storage, breakdown and transport, physiological effects and mechanism of action of Brassinosteroids, Polyamines, Jasmonic Acids, Salicylic Acids.	04
Unit IV: Sensory photobiology			
9.	November	Structure, function and mechanism of action of phytochrome, Cryptochrome and Phototropins	04

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M.Sc. (Botany) Paper- IV, Semester I
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Unit Planning (2023-24)

BOT 514 MJ : SEED SCIENCE

Miss – Kondar Prachi Sharad

Sr.No	Month	Topics	Lecture
Credit-I			15 L
Unit I: Introduction, Seed and its morphology			05L
1.	August	Definition of Seed Science, Scope and Importance. Seed: definition; Difference between seed and grain	02
2.	August	Orthodox and Recalcitrant seed; Classes of seed; Seed structure (embryo, endosperm and seed coat);	02
3	September	Chemical composition of seed (carbohydrates, proteins, oils, fats and other).	01
Unit II : Seed Legislation and Seed Law Enforcement			05L

Sr.No	Month	Topics	Lecture
4	September	Definition; Types of Seed Legislation; Seed Legislation in India; Statutory Bodies and Agencies in India under Seed Act 1966;	03
5	October	Statutory requirements for Sale of Seed; Penalties for Offenders.	02
		Unit III: Seed Dormancy and Seed Germination	05L
6	October	Definition of dormancy and its types: Causes of seed dormancy and Methods of breaking dormancy;	02
7	October	Definition of seed germination; Types of germination and Factors affecting seed germination;	02
8	October	Seed vigor, Seed ageing and Seed viability.	01

		Credit - II ;	15 L
9		Unit I: Seed Quality Testing	6L
10		Definition; Seed quality characteristics; Parameters for testing seed quality – a) GOT (grow out test); b) Germination testing, its methods (paper, sand and soil);	2L
11		c) Moisture testing: Moisture Meter and Air oven method; d) Physical purity analysis;	2L
12		Biochemical tests (Quick viability test (Tz), Peroxidase and Phenol Colour test); Seed Health Testing.	2L
13		Unit II: Seed Pathology Integrated management of seed borne diseases.	4L
14		Definition; Mechanism of seed transmission and entry point of seed infection (soil, air, insect and nematodes); Quarantine for seed	3L
15		Integrated management of seed borne diseases.	1L

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Unit Planning (2023-24)

BOUT 233 Theory Paper 3-Plant Physiology

Miss. Kondar Prachi Sharad

Sr. No	Month	Topics	Lecture
Credit I: Plant Nutrition: 15L			
1.	July	Soil- Formation, structure, composition, classification and role	02
2.	July & Aug	Essential elements- Mineral and nonmineral, criteria of essentiality, role-structural, catalytic osmotic and others; influence of pH, mineral elements interaction and microbes on availability of essential elements	03
3.	August	Mechanism of absorption of mineral elements; mechanism of assimilation of sulfur, phosphorus and nitrogen	02
4.	August	Active and passive transport, Transporters, role of ATPase and PPase	02
5.	August	Merits and demerits of use of natural and chemical fertilizers, conventional and modern methods of application of fertilizers	02
6.	August	Properties of water, water potential and factor influencing transport of water	02
7.	August	Mechanism of opening and closing of stomata, transpiration ratio and water conservation strategies in plants	02
Credit II: Photosynthesis: 15L			
8.	September	Photosystem I and II (composition, light harvesting mechanism and functioning).	02

Sr. No	Month	Topics	Lecture
9.	September	Organization of Photosynthetic electron transport system(evidence from Membrane chemical composition, electro-potential gradient and use of ETS Component inhibitors)	03
10.	September	Photo-oxidation of water	02
11.	September	Mechanism of establishment of proton gradient across the thylakoid membrane. Production of assimilatory powers of photosynthesis (ATP and NADPH)	03
12.	October	Fixation of CO ₂ : Calvin (C ₃), steps and regulation, Photorespiration-mechanism and significance	03
13.	October	Fixation of CO ₂ : C ₄ cycle, Kranz anatomy, biochemical sub-types, Single cell C ₄ Photosynthesis.	03
14.	October	CAM pathway	02
Credit III: Respiration and lipid metabolism: 15L			
15.	October	Schematic presentation of Glycolysis, TCA cycle and PPP (Home assignment). Release of energy in Glycolysis, TCA cycle and PPP and their significance	07
16.	October	Organization of respiratory electron transport system(evidence from membrane chemical composition, electro-potential gradient and use of ETS component inhibitors)	02
17.	October	Mechanism of NADPH and NADH oxidation, establishment of proton gradient across the membrane and ATP formation	01
18.	October	Cyanide resistance pathway Fatty acid biosynthesis	02
19.	October	Synthesis of membrane lipids Catabolism of storage lipids	03

Sr. No	Month	Topics	Lecture
		Significance of lipids(energy storage, defense, structure and others)	
Credit IV: Solute transport, Growth and development: 15L			
20.	October	Seed dormancy, types of dormancy, causes, and methods of break dormancy.	01
21.	November	Growth- Relative growth rate and net assimilation rate, IRGA	01
22.	November	Physiology of flowering- photoperiodism, mechanism of vernalization.	04
23.	November	Physiological organization phloem element for transport (Home assignment), Loading and unloading of phloem and mechanism of transport of solutes (Munch hypothesis); Source and sink relationship	03
24.	November	Plant growth regulators-types and the physiological roles of auxin and cytokinin.	02
25.	November	Stress physiology: Definition, Types: biotic and abiotic stress, effect of stress on Plants and elaborate any one abiotic and biotic tolerance mechanism.	02
26.	November	Schematic presentation of secondary metabolite synthesis pathways (home assignment), Classification, biosynthesis and significance of alkaloids in plants.	02