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

F. Y. B. Sc. Botany Sem. I

BO-111: PLANT LIFE AND UTILIZATION I (2019 Pattern)

Annual planning (2022-23)

Sr No	Month	Topic	Lectures
1	Aug 2022	**INTRODUCTION:** General outline of plant kingdom (Lower Cryptogams: Thallophytes- Algae, Fungi & Lichens; Higher Cryptogams: Bryophytes and Pteridophytes; Phanerogams: Gymnosperms and Angiosperms- Dicotyledons and Monocotyledons). D. c. of groups and with common examples from each.	3
2	Sept.2022	**ALGAE**: Introduction : General Characters : Classification (Bold and Wynne 1978) up to classes with reasons : Life Cycle of *Spirogyra* w.r.t. Habit, Habitat, Structure of thallus, structureof typical cell, Reproduction- Vegetative, Asexual and Sexual, systematic position with reasons : Utilization of Algae in Biofuel Industry, Agriculture, Pharmaceuticals,Food and Fodder	09
3	Sept.2022	**LICHENS:** Introduction : General Characters : Nature of Association, Forms- Crustose, Foliose and Fruticose. : Utilization of lichens.	03
4	Oct.2022	**FUNGI:** Introduction : General Characters : Classification (Ainsworth, 1973) : Life Cycle of Mushroom- *Agaricus bisporus* w.r.t. Habit, Habitat, Structure of thallus, Structure of Sporocarp, Structure of Gill, Reproduction- Asexual and sexual, Systematic position. : Utilization of Fungi in Industry, Agriculture, Food and Pharmaceuticals.	09

5	Nov.2022	**BRYOPHYTES** : Introduction : General Characters : Classification (G.M. Smith 1955) : Life Cycle of *Riccia* w.r.t. Habit, habitat, external and internal structure of thallus, Reproduction- vegetative, asexual and sexual- Structure of sex organs, fertilization, structure of mature sporophyte, structure of spore, systematic position with reasons. : Utilization: Bryophytes as ecological indicators, agriculture, fuel, industry and medicine.	06

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

T. Y. B. Sc. Botany Sem. V (2019 pattern)

Paper- II BO 352: Archegoniate

Annual planning (2022-23)

Sr No	Month	Topic	Lectures
1	Sept.2022	Introduction to Archegoniate	01
2	Sept. 2022	Introduction, general characters, distribution of Bryophytes to land habit, classification of Bryophytes according to G.M. Smith (1955) up to classes with reasons	02
3	Sept.2022	Range of thallus organization, origin of Bryophytes - Pteridophytes and Algal hypothesis, evolution of sporophyte	02
4	Sept.-2022	Study of Life Cycle of Bryophytes with respect to Taxonomic position, Morphology, Anatomy, Reproduction, Gametophytes and sporophytes of *Marchantia, Anthoceros and Funaria*	09
5	Oct.2022	Ecological and economic importance of Bryophyte	01
6	Oct. 2022	Introduction, Vascular Cryptogams, General characteristics, Classification according to K.R. Sporne (1975) up to classes with reasons, Diversity andDistribution of Pteridophytes.	02
7	Oct. 2022	Resemblances of Pteridophytes with Bryophytes, Differences betweenPteridophytes and Bryophytes, Origin of Pteridophytes -Algal and Bryophytes, Evolution of Pteridophytes- Telome Theory and Enation Theory.	03
8	Nov. 2022	Study of Life Cycle of Pteridophytes with respect to Taxonomic position,Morphology, Anatomy, Reproduction, Sporophytes and Gametophytes of *Psilotum, Selaginella* and *Equisetum*	09
9	Nov. 2022	Ecological and Economical Importance of Pteridophytes	01

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

T. Y. B. Sc. Botany Sem. V (2019 pattern)

PAPER- III: BO 353: Spermatophyta and Paleobotany

Annual planning (2022-23)

Sr No	Month	Topic	Lectures
1	Sept. 2022	**ANGIOSPERMS** **Origin of angiosperms:** with reference to time, place and ancestry- 1) Pseudanthial theory 2) Transitional-Combinational Theory	02
2	Sept. 2022	Speciation & Endemism Species concept (Biological, Taxonomic & Phylogenetic Species Concept), Speciation (Allopatric, Sympatric & Parapatric), Endemism and its types (Palaeoendemism, Holoendemism and Neoendemism)	04
3	Oct.2022	**Classification:** Outline, Merit and Demerits of Cronquist's System and APG IV system of classification. Study of following families with referenceto systematic position (As per Bentham & Hooker), Diagnostic characters, floral formula, floral diagram and any five examples with their economic importance – Nymphaeaceae, Oleaceae, Amaranthaceae, Cannaceae	06
4	Oct. 2022	**Herbaria and Botanical Gardens** Functions of Herbarium, Important herbaria (World: Kew herbarium; India:Central National Herbarium, Kolkata). Botanic gardens of the world (Royal Botanic Garden, Kew) and India	03
5	Nov.2022	**GYMNOSPERMS and PALEOBOTANY** Introduction, general characters, economic importance and classification according to Chamberlain (1934).	02
6	Nov.2022	Study of life cycle of Pinus and Gnetum with reference to distribution,morphology, anatomy, reproduction, gametophyte, sporophyte, seed structure and alternation of generations.	10
7	Dec.2022	Fossil- Definition, process of fossil formation, types of fossils -Impression, Compression, Petrifaction, Pith cast and Coal ball.	03

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

S. Y. B. Sc. Botany Sem. IV

BO 241: Plant Anatomy and Embryology- (2019 pattern)

Annual planning (2022-23)

Sr No	Month	Topic	Lectures
1	Jan. 2023	**Introduction** 1.1 Definition 1.2 Scope of plant anatomy.	02
2	Jan. 2023	**Epidermal tissue system** 2.1 Structure, types and functions of epidermis 2.2 Structure, types and functions of Stomata 2.3 Epidermal outgrowths- non-glandular and glandular 2.4 Motor cells	03
3	Jan. 2023	**Mechanical tissue system** 1 Principles involved in distribution of mechanical tissues with one example each a) Inflexibility, b) Incompressibility, c) Inextensibility and d) Shearing stress 3.2 Vascular tissue system: Structure and function of xylem, phloem and cambium	03
4	Feb. 2023	**Normal secondary growth** 4 Introduction 4.2 Normal secondary growth in dicotyledonous stem 4.3 Development of annual rings, periderm, bark, tyloses and lenticel	03
5	Feb. 2023	Anomalous secondary growth 5.1 Introduction 5.2 Causes of anomalous secondary growth 5.3 Anomalous secondary growth in: a) Dicotyledonous stem (*Bignonia*), b) Dicotyledonous root (*Raphanus*), c) Monocotyledonous stem (*Dracaena*	04
6	Feb. 2023	**Anomalous secondary growth: -** Introduction, causes, anomalous secondary growth in dicot stem (*Bignonia*) dicot root (*Raphanus*) and monocot stem (*Dracaena*).	05
7	March 2023	**Plant Embryology Introduction** Definition and scope of plant embryology	01
8	March 2023	**Microsporangium and male gametophyte** 8.1 Structure of tetrasporangiate anther 8.2 Types of tapetum 8.3 Sporogenous tissue 8.4 Microsporogenesis: process and its types 8.5 Types of microspore tetrad 8.6 Male gametophyte: structure and development of male gametophyte	04

9	March 2023	**Megasporangium and female gametophyte** 9.1 Structure 9.2 Types of ovules 9.3 Types of megaspore tetrads 9.4 Female gametophyte: structure of typical embryo sac 9.5 Types of embryo sacs – monosporic, bisporic and tetrasporic	04
10	April. 2023	**Pollination and Fertilization:** 10.1 Introduction and definition 10.2 Types of pollination 10.3 Germination of pollen grain 10.4 Entry of pollen tube- porogamy, mesogamy and chalazogamy 10.5 Double fertilization and its significance.	03
11	April2023	**Endosperm and embryo** 11.1 Endosperm: Types – nuclear, helobial and cellular. 11.2 Structure of Dicotyledonous and Monocotyledonous embryo.	03

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

T. Y. B. Sc. Botany Sem. VI (2019 pattern)

Paper I BO 361: Plant Physiology and Metabolism

Annual planning (2022-23)

Sr No	Month	Topic	Lectures
1	Feb. 2023	**Mineral nutrition**: Classification of mineral elements, macro and micronutrients; Role of essential elements; Transport of ions across cell membrane, Ionophores, Carriers and Channels	03
2	Feb. 2023	**Photosynthesis**: Mechanism of photosynthesis- Electromagnetic spectrum Ultra-Structure of Chloroplast, Organization of Light-Absorbing Antenna Systems, Light Reaction: (Cyclic and Non-cyclic photophosphorylation), Dark Reaction: Calvin–Benson Cycle, Photorespiration, C4 cycle and CAM pathway of carbon fixation).	07
3	March 2023	**Respiration:** Types of respiration (Aerobic and anaerobic), Mechanism of aerobic respiration (Glycolysis, TCA cycle, Terminal oxidation and phosphorylation in respiratory chain); Pentose Phosphate Pathway.	05
4	March 2023	**Stomatal Biology:** Light-dependent Stomatal Opening, Mediation of Blue-light Photoreception in Guard Cells by Zeaxanthin, Reversal of Blue Light–Stimulated Opening by Green Light, The Resolving Power of Photophysiology (Overview).	04
5	March 2023	**Translocation in phloem**: Composition of phloem sap, girdlingexperiment; Pressure flow model.	03
6	April 2023	**Plant growth regulators**: Discovery and physiological roles of auxins,gibberellins, cytokinins, ABA, ethylene.	05
7	April 2023	**Photomorphogenesis**: Red and far-red light responses on photomorphogenesis; Phytochrome (discovery and mode of action).	03

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

T. Y. B. Sc. Botany Sem. VI

BO 3611: Biofertilizers (Pattern 2019)

Annual planning (2022-23)

Sr No	Month	Topic	Lectures
1	Feb. 2023	**Introduction**: Introduction, Scope and importance of Biofertilizers General account of the microbes used as Biofertilizers	02
2	Feb. 2023	**Bacterial Biofertilizers** 1. Isolation of Rhizobium, Identification, Mass multiplication, Carrierbased inoculants. 2.Azospirillum isolation and mass multiplication, carrier basedinoculants and associative effect of different organisms 3.Azotobacter, classification and characteristics 4.Crop response to Azotobacter inoculums, Mass multiplication of Azotobacter 5.Applications of Azospirillum 6.Phosphate solubilizing Bacteria	09
3	March 2023	**Algal Biofertilizers** 1. Cyanobacteria (B. G. A.): Isolation of Anabaena from Azolla, Mass Multiplication of Anabaena 2.Azolla - Anabaena relationship 3.Biological Nitrogen fixation 4.Blue Green algae in a rice cultivation. 5.Applications of BGA	04
4	March 2023	Fungal Biofertilizers 4.1. Introduction, Occurrence and Distribution of Mycorrhizal association. 4:2. Types of Mycorrhizal association, growth and yield – colonization of VAM - Vesicular Arbuscular Mycorrhiza 4.3. Mycorrhizal applications in agriculture	09
5	April 2023	**Compost and Manure** Organic Farming, green manuring, organic manures and their uses Recycling by composting method of biodegradable, municipal,agricultural and industrial wastes Biocompost making methods, Types and methods of vermicomposting Benefits of vermicompost, field applications	06