



Fergusson College (Autonomous)
Pune

Learning Outcomes-Based Curriculum

F. Y. B. Sc. Botany

With effect from June 2019

Program Outcomes (POs) for B. Sc. Programme	
PO1	Disciplinary Knowledge: Demonstrate comprehensive knowledge of the disciplines that form a part of an graduate programme. Execute strong theoretical and practical understanding generated from the specific graduate programme in the area of work.
PO2	Critical Thinking and Problem solving: Exhibit the skills of analysis, inference, interpretation and problem-solving by observing the situation closely and design the solutions.
PO3	Social competence: Display the understanding, behavioural skills needed for successful social adaptation , work in groups, exhibits thoughts and ideas effectively in writing and orally.
PO4	Research-related skills and Scientific temper: Develop the working knowledge and applications of instrumentation and laboratory techniques. Able to apply skills to design and conduct independent experiments, interpret, establish hypothesis and inquisitiveness towards research.
PO5	Trans-disciplinary knowledge: Integrate different disciplines to uplift the domains of cognitive abilities and transcend beyond discipline-specific approaches to address a common problem.
PO6	Personal and professional competence: Performing dependentlyand also collaboratively as a part of team to meet defined objectives and carry out work across interdisciplinary fields.Execute interpersonal relationships, self-motivation and adaptability skills and commit to professional ethics.
PO7	Effective Citizenship and Ethics: Demonstrate empathetic social concern and equity centred national development, and ability to act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO8	Environment and Sustainability: Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO9	Self-directed and Life-long learning: Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

PSO No.	Program Specific Outcomes(PSOs) Upon completion of this programme the student will be able to
PSO1	Academic competence: (i) Recall classical botany concepts, state principles and outline processes underlying the field of botany and its related interdisciplinary subjects. (ii) Demonstrate an understanding of plant morphology, anatomy, physiology and application of economic botany and biotechnology. (iii) Execute botanical excursions for studying plant diversity, taxonomic identification and preparation of digital herbarium.
PSO2	Personal and Professional Competence: (i) Carry out group and individual activities for personal development and leadership qualities. (ii) Analyse the importance of plants and their conservation (iii) Formulate ideas, effective presentation and communication skills. (iv) Implement self-learning, discipline and problem solving ability.
PSO3	Research Competence: (i) Apply appropriate techniques for solving and analyzing research problems. (ii) Integrate knowledge of vital and applied aspects of botany for designing experiments and interpretation of results. (iii) Assess fundamental problems and provide solutions for betterment of society.
PSO4	Entrepreneurial and Social competence: (i) Employ the industrial applications of botany for start-up venture. (ii) Associate the impact of human activity on nature, importance of plant diversity and its conservation for sustainable development. (iii) Execute effective communication ability, presentations skills and report writing.

Programme Structure

Year	Course Code	Course Title	Credits
F. Y. B. Sc.	Semester I		
	BOT1101	Plant Diversity	2
	BOT1102	Phytochemistry	2
	BOT1103	Botany Practical – I	2
	Semester II		
	BOT1201	Morphology and Anatomy of Angiosperms	2
	BOT1202	Industrial Botany	2
	BOT1203	Botany Practical – II	2
S. Y. B. Sc.	Semester III		
	BOT2301	Plant Ecology and Taxonomy	2
	BOT2302	Plant Physiology and Metabolism	2
	BOT2303	Botany Practical	2
	Semester IV		
	BOT2401	Plant Anatomy and Embryology	2
	BOT2402	Economic Botany and Biotechnology	2
	BOT2403	Botany Practical	2

Year	Paper No.	Course Code	Title	Paper No.	Credits	Exam (I / E)	Marks (50 / 50)
T.Y. B.Sc.	Semester V						
	DSE-1A	BOT3501	Cryptogamic Botany	I	2	I / E	50 / 50
	DSE-1B	BOT3502	Ethnobotany	II	2	I / E	50 / 50
	DSE-2A	BOT3503	Genetics and Evolution	III	2	I / E	50 / 50
	DSE-2B	BOT3504	Spermatophyta and Paleobotany	IV	2	I / E	50 / 50
	DSE-3A	BOT3505	Horticulture and Floriculture	V	2	I / E	50 / 50
	DSE-3B	BOT3506	Cell Biology and Molecular Biology	VI	2	I / E	50 / 50
	DSE-1	BOT3507	Practical - I	Practical 1 - I	2	I / E	50 / 50
	DSE-2	BOT3508	Practical - II	Practical 1 - II	2	I / E	50 / 50
	DSE-3	BOT3509	Practical –III	Practical 1 - III	2	I / E	50 / 50
	SEC-1*	BOT3511	Bio-fertilizers	VII	2	I / E	50 / 50
	SEC-2*	BOT3512	Techniques in Plant Sciences and Biostatistics	VIII	2	I / E	50 / 50

Year	Paper No.	Course Code	Title	Paper No.	Credits	Exam (I / E)	Marks (50 / 50)
T.Y. B.Sc.	Semester VI						
	DSE-4A	BOT3601	Plant Physiology and Biochemistry	I	2	I / E	50 / 50
	DSE-4B	BOT3602	Nursery and Gardening	II	2	I / E	50 / 50
	DSE-5A	BOT3603	Plant Ecology and Biodiversity	III	2	I / E	50 / 50
	DSE-5B	BOT3604	Plant Breeding and Seed Technology	IV	2	I / E	50 / 50
	DSE-6A	BOT3605	Mycology and Plant Pathology	V	2	I / E	50 / 50
	DSE-6B	BOT3606	Plant Molecular Biology and Biotechnology	VI	2	I / E	50 / 50
	DSE-4	BOT3607	Practical – IV	Practical - IV	2	I / E	50 / 50
	DSE-5	BOT3608	Practical – V	Practical - V	2	I / E	50 / 50
	DSE-6	BOT3609	Practical - VI	Practical - VI	2	I / E	50 / 50
	SEC-3*	BOT-3611	Medico-Botany	VI	2	I / E	50 / 50
	SEC-4*	BOT-3612	Mushroom Culture Technology	VIII	2	I / E	50 / 50

F.Y. B.Sc. Semester I		
Title of the Course and Course Code	Plant Diversity BOT1101	Number of Credits : 02
Course Outcomes (COs) On completion of the course, the students will be able to:		
CO1	Outline different classification systems according to evolutionary features.	
CO2	Distinguish different plant forms to its respective group based on characteristic features and give examples.	
CO3	Classify the group and differentiate the taxonomic forms.	
CO4	Identify the life cycle pattern of various groups.	
CO5	Compare various groups within plant diversity and segregate the groups from each other using salient features.	
CO6	Compile economic and ecological significance of various groups.	

Unit No.	Title of Unit and Contents	No. of Lectures
I	Plant Diversity Role of plants in human welfare, Direct uses, indirect uses and Ecological services, Magnitude of diversity in plants, loss of diversity, need for conservation	2
II	Classification: System of classification Two Kingdom classification according to Carlous Linnaeus (1758), Three Kingdom classification according to Earnst Haeckel (1866), Five Kingdom classification according to Robert H. Whittaker (1969) General outline of plant kingdom.	3
III	Algae: General characters, Pigments in algae, Food reserves Algal flagella, Range of thallus diversity, Methods of reproduction, Outline of classification according to Lee (1980) up to classes with reasons, Role of algae in industry and agriculture, Life cycle of <i>Chara</i> .	6
IV	Fungi: General characters, Habit (Types of mycelium), Mode of nutrition, Methods of reproduction, Outline of classification according to Hibbet et.al (2011) up to classes with reasons, Role of fungi in industry, agriculture and health, Life cycle of <i>Mucor</i> .	5
V	Lichens: General characters of lichens, Types of Lichens on the basis of thallus morphology, Methods of reproduction, Economic and ecological significance	2
VI	Bryophytes: General characters, Methods of reproduction, Outline of classification according to recent up to classes with reasons, Economic and ecological significance, Life cycle of <i>Riccia</i> .	5
VII	Pteridophytes: General characters, Outline of classification according to recent up to classes with reasons, Economic importance	5

	Life cycle of <i>Nephrolepis</i> .	
VIII	Gymnosperms: General characters, Outline classification according to recent up to classes with reasons. Economic importance, Life cycle of <i>Cycas</i> .	4
IX	Angiosperms: General characters Outline classification according to Bentham and Hooker (1883) up to classes with reasons, Life cycle pattern in angiosperm.	4

References:

1. Brodie J. and Lewis J- Unravelling the algae: the past, present and future of algal systematics.
2. Bellinger E.G. and Sigeo D.C- Freshwater algae: Identification and uses as bioindicators,
3. Cole K.M. and Sheath R.G - Biology of the red algae.
4. Desikachary T.V. - Cyanophyta.
5. Graham L.E. and Wilcox L.W- Algae.
6. Krishnamurthy V- Algae of India and neighboring countries I. Chlorophycota.
7. Lee R.E- Phycology.
8. Misra J.N - Phaeophyceae in India.
9. Prescott G.W- The algae.
10. Smith G.M -The fresh water algae of the United States.
11. Srinivasan K.S -Phycologia India. Vol. I & II.
12. Das Dutta and Gangulee -College Botany Vol I.
13. Vashista B.R, Sinha A.K and Singh V.P. Botany for degree students –Algae.
14. Ainsworth, Sussman and Sparrow -The fungi. Vol IV A & IV B.
15. Alexopolous C.J., Minns C.W. and Blackwell M - Introductory Mycology.
16. Deacon J.W - Fungal Biology.
17. Kendrick B- The fifth kingdom
18. Kirk et al.- Dictionary of fungi.
19. Mehrotra R.S. and Aneja K.R - An introduction to mycology.
20. Miguel U., Richard H., and Samuel A -Illustrated dictionary of the Mycology.
21. Webster J. and Rpland W- Introduction to fungi.
22. Dube H.C - An Introduction to fungi.
23. Sharma O.P - A text book of fungi.
24. Vashista B.R and Sinha A.K- Botany for degree students – Fungi, S. Chand's Publication.
25. Cavers F- The interrelationships of the Bryophytes.
26. Chopra R.N. and Kumar P.K - Biology of Bryophytes.
27. Kashyap S.R. - Liverworts of the Western Himalayas and the Punjab Plain. Part 1
28. Kashyap S.R.- Liverworts of the Western Himalayas and the Punjab
29. Plain (illustrated): Part 2.
30. Parihar N.-. Bryophytes: An Introduction to Embryophyta. Vol I.
31. Prem Puri - Bryophytes: Morphology, Growth and Differentiation.
32. Udar R. Bryology in India.
33. Udar R.- Introduction to Bryophytes.Watson E.V - Structure and Life of Bryophytes.
34. Vashista B.R., Sinha A.K., Kumar A -Botany for degree students –Bryophyta.
35. Agashe S.N - Paleobotany.
36. Arnold A.C - An Introduction to Paleobotany.

37. Eames E.J - Morphology of Vascular Plants.
38. Rashid A - An Introduction to Pteridophyta.
39. Sharma O.P - Textbook of Pteridophyta.
40. Smith G.M -Cryptogamic Botany Vol II.
41. Sporne K.R.- The morphology of Pteridophytes.
42. Stewart W.N. and Rothwell G.W - Paleobotany and the Evolution of Plants.
43. Vashista B.R., Sinha A.K., Kumar A- Botany for degree students –Pteridophyta.
44. Gangulee and Kar - College Botany.
45. Sundar Rajan S - Introduction to Pteridophyta.
46. Surange K.R. - Indian Fossil Pteridophytes.
47. Parihar N.S.- Biology and Morphology of Pteridophytes.
48. Pandey. B. P - Plant Anatomy.

Title of the Course and Course Code	PHYTOCHEMISTRY BOT1102	Number of Credits : 02
Course Outcomes (COs) On completion of the course, the students will be able to:		
CO1	Define Phytochemistry and describe metabolites.	
CO2	Explain metabolites and differentiate primary and secondary metabolites.	
CO3	Illustrate the basic chemical composition of carbohydrates, proteins, oils, alkaloids, fats, tannins, vitamins and organic acids.	
CO4	Categorize plant resources and relate them to metabolites.	
CO5	Review metabolites from plant resources and compare phytochemicals.	
CO6	Specify commercial importance of metabolites.	

Unit No.	Title and Contents	No. of Lectures
I	Plants as organic laboratories Introduction, Definition, Primary and secondary metabolites, Source and sink relationship, Plants - The best chemist of the world.	4
II	Carbohydrates Introduction, Plant resources, Basic chemical composition-sugar, starch, gums and mucilage, Examples w. r. t. - Botanical source, family, part used, type, uses - Sugarcane, Rice, Gum acacia, Ispaghula.	6
III	Proteins Introduction, Plant resources, Basic chemical composition, Examples w. r. t. - Botanical source, family, part used, type, uses - Soyabean Grain <i>Amaranthus</i> (Rajgira), <i>Spirulina</i> , Mushroom.	4
IV	Oils and fats Introduction (Properties-Physical and Chemical), Plant resources, Basic chemical composition, Examples w. r. t. - Botanical source, family, part used, type, uses - Coconut, Safflower, <i>Garcinia</i> , Eucalyptus, lemon grass.	6
V	Glycosides and Alkaloids Introduction, Plant resources, Basic chemical composition, Examples w. r. t. - Botanical source, family, part used, type, uses - <i>Aloe</i> , <i>Asparagus</i> , <i>Catharanthus</i> , Adathoda.	4
VI	Tannins Introduction , Plant resources, Basic chemical composition, Examples w. r. t. - Botanical source, family, part used, type, uses - Tea, Kattha	4
VII	Latex Introduction, Plant resources, Basic chemical composition, Examples w. r. t. - Botanical source, family, part used, type, uses - <i>Hevea</i> rubber, <i>Achras sapota</i> (Chewing gum).	4

VIII	Vitamins and Organic acids Introduction, Plant resources, Basic chemical composition, Examples w. r. t. - Botanical source, family, part used, type, uses - Amla (Vit. C), Carrot (Vit. A), Tamarind (Tartaric acid), Citrus fruits (Citric acid).	4
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References:

1. Shah and Quadry's (2005). Pharmacognosy. B. S. Shah Prakashan
2. Daniel – Phytochemical analysis.
3. Kokate C.K. –Pharmacognosy.
4. Sheth A (2005). The herbs of Ayurveda. Vol. I, II, II, IV

Title of the Course and Course Code	BOTANY PRACTICAL – I BOT1103	Number of Credits : 02
Course Outcomes (COs) On completion of the course, the students will be able to:		
CO1	List and describe the plant resources containing primary and secondary metabolites.	
CO2	Classify the different plant forms to its respective groups based on their thallus structure and reproduction.	
CO3	Demonstrate the extraction of essential oil and its applications.	
CO4	Identify Life cycle patterns of various groups and categorize different phytochemical test for primary and secondary metabolites.	
CO5	Justify the life cycles pattern of different groups with respect to their scientific classification.	
CO6	Write a tour report and submit photos representing plant diversity.	

Practical No.	Title of Practical
1	Study of <i>Chara</i>
2	Study of <i>Mucor</i> Types of lichens
3	Study of <i>Riccia</i>
4	Study of <i>Nephrolepis</i>
5	Study of <i>Cycas</i>
6	Study of any one plant resources from Carbohydrates, Proteins, Glycosides and Alkaloids.
7	Study of any one plant resources from Tannins, Latex, Vitamins and Organic acid.
8	Demonstration of extraction of lemon grass oil.
9	Tests for Starch and Protein.
10	Test for Tannin and Alkaloid.

F.Y. B.Sc. Semester II		
Title of the Course and Course Code	MORPHOLOGY AND ANATOMY OF ANGIOSPERMS BOT1201	Number of Credits : 02
Course Outcomes (COs) On completion of the course, the students will be able to:		
CO1	Retrieve the facts pertaining to the primary structure of angiosperms.	
CO2	Discuss the basic concepts of inflorescence, parts of a typical flower, fruit and tissue systems.	
CO3	Examine the modifications in the primary structure and correlate with the variations of plant structure in nature.	
CO4	Identify the patterns in the anatomical structures of angiosperms.	
CO5	Compare the variations in the reproductive parts and tissue systems within the basic taxonomic plant divisions.	
CO6	Compile the significance of the basic morphological and anatomical differences within Angiospermic plants and construct a scheme for identification of plants in nature.	

Unit No.	Title and Contents	No. of Lectures
I	General Organization of Plant Body Seed: a capsule of life, fundamental parts of primary and secondary plant body. Organization of Plant Body I Root system – Characteristics, parts, functions of root, modification of root with examples for storage and adaptations. II Shoot system- Characteristics, parts, functions of shoot, modification of root with examples for storage and adaptations. Leaf: Characteristics, parts, functions of leaf and types of leaves: Simple and Compound. Phyllotaxy, Leaf venation, Modifications of leaf, Functions of leaf	4
II	Inflorescence Definition and characters, Types, Racemose – Characters and subtypes with examples: raceme, spike, spadix, umbel, and capitulum, Cymose - Characters and subtypes with examples: solitary, monochasial, dichasial and polychasial, Special type of inflorescence- Characters with examples: cyathium, hypanthodium Significance.	4
III	Flower Definition and parts of typical flower: symmetry, Thalamus forms- anthophore, androphore, gynophore, Insertion of floral whorls on the thalamus- Hypogynous, perigynous and epigynous. Calyx modifications - Petaloid, pappus and spurred, Aestivation. Corolla forms - Polypetalous-cruciform, papilionaceous: Gamopetalous- infundibuliform and bilabiate Perianth -types: Polyphyllous and gamophyllous condition. Androecium : parts of a typical stamen, arrangement of stamen-tetradynamous, didynamous, heterostemonous;	12

	Attachment of anther- basifixed,dorsifixed and versatile. Cohesion- adelphy, syngeny and synandry. Adhesion; epipetalous, epiphylous and gynandrous. Gynoecium: parts of a carpel, types- simple (apocarpous) and compound (syncarpous); Placentation - definition and types.	
IV	Fruit: Definition, parts of a fruit, Types Simple- achene, cypsela, caryopsis, legume, follicle, capsule, drupe, berry and hesperidium. Aggregate-: Etaerio of berries, achenes and follicles. Multiple fruits: Syconus and Sorosis.	5
V	Types of tissue systems: Definition. Meristematic tissue system: - Meristem, characters and types based on position, Simple and complex tissue, Epidermal tissue system: - Epidermis, structure of typical stomata, trichomes, motor cells; functions Mechanical tissue system: - Collenchyma, sclerenchyma and xylem elements, functions. Vascular tissues: - Components of xylem and phloem, types of vascular bundles, functions.	6
VI	Internal Organization of Primary Plant Body: Comparative account of primary structure of root, stem and leaf of Dicot Vs Monocot plants.	5

References:

1. Gangulee and Kar - College Botany.
2. V N. Naik - Taxonomy of Angiosperms.
3. S. C. Dutta - Systematic Botany
4. Gangulee, Das and Datta - College Botany, Vol. I
5. V. Singh and D. K. Jain - Taxonomy of Angiosperms
6. B. P. Pandey - Plant Anatomy
7. B. P. Pandey - A Text Book of Botany- Angiosperms
8. B. P. Pandey -College Botany, Volume II
9. J. Eames, L.H & Mc. Daniels - An introduction to plant anatomy
10. Fahn , A - Plant anatomy
11. Esau K., John Wiley & Sons- Anatomy of seed plants
12. Lawrence GHM - Taxonomy of vascular plant
13. Eames A. J - Morphology of the angiosperms
14. Ashok Bendre & Ashok Kumar - A Text Book of Practical Botany II.
15. Pijush Roy - Plant Anatomy.
16. Chandurkar, P. J - Plant Anatomy
17. A.C. Dutta - Botany for Degree Students
18. V. Singh, P. C. Pande & D. K.Jain - A text book of Botany: Angiosperms

Title of the Course and Course Code	INDUSTRIAL BOTANY BOT1202	Number of Credits : 02
Course Outcomes (COs) On completion of the course, the students will be able to:		
CO1	Describe the techniques of plant tissue culture.	
CO2	Discuss the advantages and limitations of greenhouse technology and classify the types.	
CO3	Outline the cultivation practices, harvesting and marketing of Rose and Gerbera.	
CO4	Explain the cultivation practices of Oyster mushrooms.	
CO5	Evaluate the advantages of biofuel technology, biocontrol and compare the important commercial products.	
CO6	Compile the applications of industrially important fungi and collect information on their products.	

Unit No.	Title of Unit and Contents	No. of Lectures
I	Plant Tissue Culture Concept of tissue culture, Culture techniques: Types of explants, preparation of media, methods of sterilization, inoculation techniques, incubation and hardening, Commercial significance	5
II	Greenhouse technology Introduction, advantages and limitations, Types of greenhouses, Greenhouse structure, principle- i) Site selection and orientation; Structure materials; Covering materials; Temperature and humidity control.	6
III	Floriculture Industry Introduction to floriculture, Cultivation practices, harvesting and marketing of Rose and <i>Gerbera</i> .	5
IV	Mushroom Cultivation Mushroom cultivation: Introduction, nutritional and medicinal value of edible mushrooms, Cultivation practices of Oyster mushroom, uses of mushrooms.	5
V	Bio-fuel Technology Introduction and advantages, Concept of bio-fuel and its need, Plants used for bio-fuel production, Biodiesel production from Castor.	5
VI	Bio-control Introduction, sources and advantages, Important commercial products – Source, preparation and uses of Pyrethins, Azadiractin, Trichoderma, Trichogramma	5
VII	Industrial Mycology Introduction, Important genera of fungi used in various Industries and their products, Products and applications of Ganoderma, <i>Penicillium</i> , <i>Aspergillus</i> and Yeast.	5

References:

1. Textbook of Economic Botany, Verma V., Ane Books Pvt. Ltd.
2. Economic Botany in the Tropics, Kochhar, Macmillan Publisher.
3. Economic Botany: Principles and Practices, Gerald E. Wickens, Springer Publication.
4. Floriculture in India, Gurcharan Singh Randhawa and Amitabha Mukhopadhyay, Allied Publishers.
5. Floriculture Marketing in India, Debashish Sengupta and Raj Kamal, Excel Books.
6. Floriculture Hand Book, Eiri, Engineers India Research in Publication.
7. Nursery Management, John Mason, Landlinks Press Publisher.
8. Plant Nursery Management: How to Start and Operate a Plant Nursery, Ray, P.K., Scientific Publishers.
9. Nursery Management, John Mason, Landlinks Press Publisher.
10. Plant Nursery Management: How to Start and Operate a Plant Nursery, Ray, P.K., Scientific Publishers.
11. Introduction to Plant Tissue Culture (2/e), M. K. Razdan, Science Publishers.
12. Plant Cell and Tissue Culture, Indra K. Vasil, (Eds. - Indra K. Vasil, Trevor A. Thorpe), Springer Publication.
13. The Complete Book on Organic Farming and Production of Organic Compost, NPCS Board of Consultants & Engineers, Asia Pacific Business Press Inc.
14. The Organic Farming Manual: A Comprehensive Guide to Starting and Running a Certified Organic Farm, Ann Larkin Hansen, Storey Publications.
15. Hand Book of Mushroom Cultivation, Processing and Packaging, Engineers India Research in Publishers
16. Growing Gourmet and Medicinal Mushrooms, Paul Stamets, Ten Speed Press Publishers
17. Handbook of Seed Science and Technology: Seed biology, Production, and Technology, Amarjit S. Basra, Food Products Press publishers.
18. Zhiqiang A.N. (2004) Handbook of Industrial Mycology. CRC Press
19. Gary Leatham (1993) Frontiers in Industrial Mycology. Springer

Title of the Course and Course Code	BOTANY PRACTICAL – II BOT1203	Number of Credits : 02
Course Outcomes (COs) On completion of the course, the students will be able to:		
CO1	Describe and identify the different types of inflorescence, flowers and fruits.	
CO2	Explain and differentiate various steps required for cultivation of oyster mushrooms.	
CO3	Demonstrate different steps of plant tissue culture technique.	
CO4	Categorize the type of inflorescences, flowers and fruits.	
CO5	Determine anatomical features of dicot and monocot.	
CO6	Write a tour report on the type of poly houses and its application in horticulture and floriculture industry.	

Practical No.	Title of Practical
1	Study of Inflorescence: Racemose: Raceme, Spike, Spadix, Umbel and Capitulum. Cymose: Solitary cyme, Uniparous cyme: Helicoid and Scorpioid, Biparous cyme and Multiparous cyme.
2	Study of flower with respect to Calyx, Corolla and Perianth.
3	Study of flower with respect to Androecium and Gynoecium.
4	Study of fruits with suitable examples Simple fruit: Fleshy- Berry and Drupe Dry: Achene, Cypsella and Legume Aggregate fruit: Etaerio of follicles and Etaerio of Berries Multiple fruit: Syconus and Sorosis.
5	Study of internal primary structure of dicotyledonous root, stem and leaf.
6	Study of internal primary structure of monocotyledonous root, stem and leaf.
7	Study of plant resources used in biopesticides: (Azadiractin & Trichoderma)
8	Study of industrially important fungi and their products. <i>Ganoderma</i> : Ganoderma tablets, <i>Aspergillus</i> : citric acid; Yeast: Bakery products and <i>Penicillium</i> : Penicillin tablets.
9	Study of plant tissue culture technique: Demonstration of various stages.
10	Cultivation of <i>Oyster</i> mushroom: Demonstration of various stages