



Karmaveer Bhaurao Patil University, Satara

Syllabus for

B. Sc. I (Botany)

Under

Faculty of Science and Technology

(As per NEP 2020)

With effect from Academic Year 2024-2025

Syllabus for Bachelor of Science (B. Sc.) Part – I Botany

PREAMBLE:

The B.Sc. Botany course under the autonomy framework will be introduced in the academic year 2024-2025. It has been designed to meet the specific needs of B.Sc. Botany students in accordance with the NEP 2020 guidelines. The curriculum has been developed to reflect the expanding scope of biological sciences. The focus is on equipping students with up-to-date knowledge while maintaining a strong foundation in classical botany. This approach will enable students to understand and appreciate contemporary interdisciplinary methods in plant science and their contributions to societal development. The course also includes new practical exercises, providing students with hands-on experience with the latest techniques currently in use. Additionally, the course is intended to inspire students to pursue higher studies in botany, become entrepreneurs, and seek employment in plant-based industries.

GENERAL OBJECTIVES OF THE COURSE:

1. To provide students with a solid foundation in plant science.
2. To foster a scientific mindset, encouraging students to be open-minded, critical, and curious.
3. To develop practical skills in conducting experiments and working with laboratory materials.
4. To help students understand scientific terms, concepts, facts, phenomena, and their interrelationships.
5. To raise students' awareness of natural resources and environmental issues.
6. To equip students with knowledge of plants and related subjects, enabling them to better understand nature and the environment for the benefit of humanity.
7. To empower students to apply their knowledge to enhance agriculture and related fields, promoting self-reliance.

PROGRAMME OUTCOMES

After completing the B.Sc. program, graduates will:

1. Possess a strong foundation of knowledge in their chosen field of study.
2. Develop a scientific mindset, becoming open-minded, critical, and curious, which will support their entry into research and innovation.

3. Be skilled in practical work, experiments, and the use of laboratory materials.
4. Be eligible to pursue higher studies in their field, both in India and abroad.
5. Qualify to appear for examinations for jobs in government organizations.
6. Meet the minimum eligibility requirements for various science-related job opportunities.
7. Be prepared to establish their own entrepreneurial ventures.
8. Enhance critical thinking, develop a scientific attitude, solve problems, improve practical skills, boost communication abilities, and strengthen social interactions.

PROGRAMME SPECIFIC OUTCOMES

After completing the B.Sc. (Botany) program, students will:

1. Be able to explain, describe, discuss, and ask questions about various aspects of plant sciences.
2. Design and conduct experiments related to plant sciences.
3. Critically analyze the interactions between living and non-living entities in their surroundings.
4. Apply knowledge of plant sciences to develop sustainable solutions for both society and industry.
5. Utilize their understanding of plant sciences to become self-reliant, either by securing a job, establishing an agricultural setup, or launching a plant-based entrepreneurial venture.
6. Design and manage projects related to plant sciences.
7. Gain valuable skills in plant-based industries through internships.
8. Enhance research skills through research internships and in-house projects.
9. Present research findings at conferences and in research journals for publication.
10. Critically assess their role in contributing to environmental sustainability goals as responsible citizens.

1. TITLE: **Botany**

2. YEAR OF IMPLEMENTATION: **2024-2025**

3. DURATION: **01 year**

4. PATTERN: **Semester examination**

5. MEDIUM OF INSTRUCTION: **English**

6. Eligibility of the Students:

Higher Secondary Certificate (HSC/10+2) examination or an equivalent examination from a recognized Board with the Science stream, including Biology as one of the subjects

7. Eligibility of the Core Faculty:

As per the rule and regulation of the UGC and Government of Maharashtra

8. STRUCTURE OF COURSE:

3.STRUCTURE OF COURSE:							
Level	Semester	Course	DSC	OE	AEC/VEC/IKS	Total	Degree/Cum. Cr. MEME
4.5	I	I	DSC-I (2) DSC-II (2) DSC P-I (2)	2	IKS I (2) (Generic)	22	UG Certificate 44
		II	DSC-I (2) DSC-II (2) DSC P-I (2)				
		III	DSC-I (2) DSC-II (2) DSCP-I (2)				
4.5	II	I	DSC-I (2) DSC-II (2) DSC P-I (2)	2	VEC I (2) DEGG and IIC	22	
		II	DSC-I (2) DSC-II (2) DSC P-I (2)				
		III	DSC-I (2) DSC-II (2) DSC P-I (2)				

9. COURSE TITLE:

1) FIRST SEMESTER

Sr. No.	Subject Title	Theory				Practical		
		Course No. & Course Code	Title of Paper	No. of lectures per week	Credits		No. of Practical Per week	Credits
1	Botany	Course – I BBT 111	Diversity of Cryptogams	4	4	Practical Course– I BBP 113	2	2
		Course –II BBT 112	Economic Botany					

2	OE	BBTOE 1	-	2	2			
3	IKS	BBTIKS 1	-	2	2			

2)SECOND SEMESTER

Sr. No.	Subject Title	Theory				Practical		
		Course No. & Course Code	Title of Paper	No. of lectures per week	Credits		No. of Practical Per week	Credits
1	Botany	Course – III BBT 121	Diversity of Archegoniate	4	4	Practical Course– II BBP 123	2	2
		Course – IV BBT 122	Fundamentals of Plant Taxonomy					
2	OE	BBTOE-II	-	2	2			
3	VEC	BBTVEC I	DEGG and IIC	2	2			

10. EVALUATION STRUCTURE:

Theory

Assessment Category	Internal Evaluation (Best of two CCE Marks will be considered)				ESE	Total Marks	Credits
	CCE-I	CCE-II	CCE-III	Total			
Theory of 2 Credits	10	10	10	20	30	50	02

Practical

Assessment Category	Internal Evaluation	ESE	Total Marks	Credits
	Journal / Viva/Activity			
Practical of 2 Credits	20	30	50	02

11.OTHER FEATURES:

LIBRARY:

Reference books, Textbooks, journals, and Periodicals are available in Institute and Departmental Library. (Separate reference lists are attached along with the respective course syllabus)

EQUIPMENT:

a. Computer, LCD projector, visualizer, smart board

b. Laboratory Equipment:

1. Microscope with a digital camera
2. Hot Air Oven
3. Digital weighing balance
4. Incubator
5. pH meter
6. Refrigerator
7. Microtome
8. Autoclave etc.

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	Yashavantrao Chavan Institute of Science, Satara	
	Board of Studies in Botany	
	Programme: B. Sc.	Semester – I
	Type: DSC I	Marks: 50
	Credits: 2	From: A. Y. 2024-25
	Name of the Course: BBT 111: Diversity of Cryptogams	
Course Objectives: By the end of the course, students will be able to: 1. Understand knowledge of different plant groups. 2. Gain the knowledge of the biodiversity of lower plant groups. 3. Know importance of lower plant groups. 4. Impart knowledge of opportunities for a career in the uses of lower plant groups.		
Course Outcomes: By the end of the course, students should be able to: 1. Explain the features and uses of lower cryptogams. 2. Discuss concepts regarding lower cryptogams. 3. Write answers and brief notes about the plant diversity of lower cryptogams. 4. Seek career opportunities in academics, research, and entrepreneurship with respect to lower cryptogams.		
Module	Title and Contents	Hrs.
Module 1	Module 1: Introduction to the Plant Kingdom 1.1 Evolutionary history of Plants, Evolutionary time scale 1.2 Systems of classification (Two, Three, and Five kingdom systems), General outline of the plant kingdom	07
Module 2	Module 2: Algae 2.1 General Characters of Algae 2.2 Classification System of Algae (by G. M. Smith) 2.3 Economic Importance of Algae 2.4 Morphology and life cycles (excluding developmental stages) of <i>Nostoc</i> and <i>Spirogyra</i>	08
Module 3	Module 3: Fungi 3.1 General Characters of Fungi 3.2 Classification System of Fungi (by G. C. Ainsworth) 3.3 Economic Importance of Fungi 3.4 Morphology and life cycle (excluding developmental stages) of <i>Mucor</i> and <i>Penicillium</i>	07

Module 4	Module 4: Lichens 4.1 General characters of Lichens 4.2 Types of Lichens based on thallus morphology 4.3 Methods of Reproduction in Lichens 4.4 Economic Importance of Lichens	08
Reference Books: 1. Vashishtha, B.R., Sinha, A.K., and Kumar, A. 2016. Botany for Degree Students – Fungi. S. Chand and Company, New Delhi. 2. Alexopoulos, C.J., Mims, C.W., and Blackwell, M. 2007. Introductory Mycology. 4th Edition. Wiley India Pvt. Ltd., India. 3. Awasthi, D.D. 2000. A Handbook of Lichens. Bishen Singh Mahendra Pal Singh, Dehradun. 4. Gangulee, H.S., and Kar, A.K. 1992. College Botany, Vol. I and II. New Central Book Agency (P) Ltd., Kolkata. 5. Sharma, O.P. 1992. Textbook of Thallophytes. Tata McGraw Hill, New Delhi. 6. Sharma, P.D. 1991. The Fungi. Rastogi and Company, Meerut. 7. Kumar, H.D. 1990. Introductory Phycology. East-West Press, New Delhi. 8. Dube, H.C. 1990. An Introduction to Fungi. Vikas Publishing House Pvt. Ltd., New Delhi. Sharma, O.P. 1989. Textbook of Fungi. Tata McGraw Hill, New Delhi.		
Evaluation Pattern:		
Total Marks: 50		
Internal Continuous Evaluation (20 Marks): • CCE - I: 10 Marks: Home Assignment • CCE - II: 10 Marks: Short and long answer questions Test/Seminar/Open Book Test/Quiz/Case study/Book review/Field work/ Industry visit • CCE- III: 10 marks: Compulsory MCQ test (Note: Best of two CCE marks will be considered)	End Semester Examination (30Marks): • Question-1: Solve the following questions (five questions of 2 marks) 10 M • Question-2: Attempt any two questions (three questions of 10marks) 20 M • Question-3: Attempt any four questions (five questions of 5 marks) 20 M • Note: Conversion of 50 marks of ESE to 30 marks	

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	Board of Studies in Botany	
	Programme: B. Sc.	Semester – I
	Type: DSC II	Marks: 50
	Credits: 2	From: A. Y. 2024-25
	Name of the Course: BBT 112: Economic Botany	

Course Objectives: By the end of the course, students will be able to:

1. Impart knowledge of plant biology and how humans use different plant structures.
2. Understand the botanical aspects and origins of important food, medicinal, and economically important plants.
3. Make the students knowledgeable about the importance of plants and their different roles.
4. Empower the students with the ability to analyze the plant structures and interactions with hands-on field experiments.

Course Outcomes: By the end of the course, students should be able to:

1. Get knowledge and understanding of the range of plant diversity in terms of function and environmental relationships.
2. Carry out practical work, in the field and in the laboratory, with minimal risk.
3. Get knowledge and understanding of current trends in economic botany.
4. Think logically and organize tasks to transfer appropriate knowledge and methods in economic botany.

Module	Title and Contents	Hrs.
Module 1	Module 1: Origin of Cultivated Plants 1.1 Introduction, Concept of Centers of Origin, and their Importance with Reference to Vavilov's Work 1.2 Examples of major plant introductions; Crop domestication and loss of genetic diversity; evolution of new crops/varieties, the importance of germplasm diversity	08
Module 2	Module 2: Cereals, Legumes and Millets 2.1 Cereals: Origin, Botanical Name, Morphology, Sources, and Economic Importance of Rice and Wheat. 2.2 Legumes: Origin, Botanical Name, Morphology, Sources, and Economic Importance of Gram and Pigeon Pea.	07

	2.3 Millets: Origin, Botanical Name, Morphology, Sources, and Economic Importance of Finger Millet and Foxtail Millet	
Module 3	Module 3: Oil yielding plants and Spices 3.1 Oils and Fats: Origin, Botanical Name, Morphology, Sources, and Economic Importance of Groundnut and Soybean. 3.2 Spices and Condiments: Origin, Botanical Name, Morphology, Sources, and Economic Importance of Ginger and Chilly	08
Module 4	Module 4: Beverages and Fibers 4.1 Beverages: Origin, Botanical Name, Morphology, Sources, and Economic Importance of Tea and coffee. 4.2 Fibre-yielding Plants: Origin, Botanical Name, Morphology, Sources, and Economic Importance of Cotton and Agave	07
Reference Books: - De Candolle, A. "Origin of Cultivated Plants". Legare Street Press, 2022. - Cho, S., and Almeida, N. "Dietary Fiber and Health". 1st Edition. CRC Press, 2017. - Levetin, E., and McMahon, K. "Plants & Society". 7th Edition. New York: McGraw-Hill, 2016. - Kochhar, S.L. "Economic Botany in Tropics". 4th Edition. New Delhi: Macmillan India Ltd., 2011. - Sharma, O.P. "Economic Botany". New Delhi: Tata McGraw Hill Publishing Company Ltd., 1996. - Sambamurthy, A.V., and Subramanyam, N.S. "A Textbook of Economic Botany". New Delhi: Wiley Eastern Ltd., 1989. - Simpson, B.B. "Economic Botany: Plants in Our World". New York: McGraw-Hill, 1986		
Evaluation Pattern:		
Total Marks: 50		
Internal Continuous Evaluation (10Marks): - CCE - I: 10 Marks: Home Assignment - CCE - II: 10 Marks: Short and long answer questions Test/Seminar/Open Book Test/Quiz/Case study/Book review/Field work/ Industry visit - CCE- III: 10 marks: Compulsory MCQ test (Note: Best of two CCE marks will be considered)		End Semester Examination (30Marks): - Question-1: Solve the following questions (five questions of 2 marks) 10 M - Question-2: Attempt any two questions (three questions of 10marks) 20 M - Question-3: Attempt any four questions (five questions of 5 marks) 20 M Note: Conversion of 50 marks of ESE to 30 marks

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	Board of Studies in Botany	
	Programme: B. Sc.	Semester – I
	Type: DSC P	Marks: 50
	Credits: 2	From: A. Y. 2024-25
	Name of the Course: Practical Course- BBP 113	

Course Objectives: By the end of the course, students will be able to:

1. Learn and identify lower plant groups.
2. Give practical knowledge to students about economic uses of plants.
3. Participate students in experiential learning with these practicals.
4. Enable students to think about novel uses of plants.

Course Outcomes: By the end of the course, students should be able to:

1. Observe and describe general characters of lower plant groups through representative members.
2. Recognize the members of lower plant groups and identify the plant parts.
3. Identify the plants and relate their economic uses.
4. Compare and predict novel economic uses of the plants.

Practical No.	Title and Contents	No. of hours per practical
1.	Study of Microscope	04
2.	Study of algae - <i>Nostoc</i> .	04
3.	Study of algae - <i>Spirogyra</i> .	04
4.	Study of fungi - <i>Mucor</i> .	04
5.	Study of fungi - <i>Penicillium</i>	04
6.	Study of types of lichens (based on morphology).	04
7.	Study of the botanical name, morphology, parts used, and economic importance of Wheat.	04
8.	Study of the botanical name, morphology, parts used, and economic importance of Rice	04
9.	Study of the botanical name, morphology, parts used, and economic importance of Gram and Pigeon pea	04
10.	Study of the botanical name, morphology, parts used, and economic importance of Finger millet and Foxtail millet	04
11.	Study of the botanical name, morphology, parts used, and economic importance of Ginger, and Chilly.	04
12.	Study of the botanical name, morphology, parts used, and economic importance of Tea, and Coffee.	04
13.	Study of the botanical name, morphology, parts used, and economic importance of Groundnut and Soybean.	04

14.	Study of the botanical name, morphology, parts used, and economic Importance of Cotton and Agave.	04
15.	Field visit to any suitable place	04
Reference Books: 1. Bendre, A. "Practical Botany". Meerut: Rastogi Publications, 2010. 2. Pande, B.P. "Modern Practical Botany". Vol. II. New Delhi: S. Chand Publishers, 1979. 3. Pande, B.P. "Modern Practical Botany". Vol. I. New Delhi: S. Chand Publishers, 1979. 4. Wallis, C.J. "Practical Botany for Advanced Level and Intermediate Students". 5th Edition. London: William Heinemann Medical Books Ltd., 1966.		
Evaluation Pattern:		
Total Marks: 50		
Internal Evaluation (20 marks): • Journal: 10 Marks • Students Performance: 10 Marks		End Semester Examination (30 Marks): • 4 questions

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	Programme: B. Sc.	Semester – I
	Type: DSC III	Marks: 50
	Credits: 2	From: A. Y. 2024-25
	Name of the Course: BBT 121: Diversity of Archegoniate	

Course Objectives: By the end of the course, students will be able to:

1. Explain the characteristics, classification, and importance of Bryophytes.
2. Describe the morphology, life cycle, and significance of Pteridophytes.
3. Explain the classification and life cycle of Gymnosperms.
4. Describe the basics of Palaeobotany and fossil formation.

Course Outcomes: By the end of the course, students should be able to:

1. Explain the classification and life cycle of Bryophytes.
2. Describe the morphology and reproduction of Pteridophytes.
3. Analyze the characteristics and life cycle of Gymnosperms.
4. Explain the geological time scale and types of fossils.

Module	Title and Contents	Hrs.
Module 1	Module 1: Bryophytes 1.1 General characters of Bryophytes 1.2 Classification System in Bryophytes (by G. M. Smith) 1.3 Alteration of Generation 1.4 Economic importance of Bryophytes 1.5 Morphology, anatomy, and life cycle (excluding developmental stages) of <i>Riccia</i> and <i>Funaria</i>	08
Module 2	Module 2: Pteridophytes 2.1 General characters of Pteridophytes 2.2 Classification system in Pteridophytes (by G. M. Smith) 2.3 Economic importance of Pteridophytes 2.4 Morphology, anatomy, and life cycles (excluding developmental stages) of Lycopsida - <i>Selaginella</i> , Pteropsida – <i>Pteris</i> 2.5 Heterospory and seed habit.	07

Module 3	Module 3: Gymnosperms 3.1 General characters of Gymnosperms 3.2 Classification system in Gymnosperms (by Sporne) 3.3 Economic importance of Gymnosperms 3.4 Morphology, anatomy, and life cycle (excluding developmental stages) of Cycadopsida- <i>Cycas</i> (primitive) and Gnetopsida - <i>Gnetum</i> (advanced)	08
Module 4	Module 4: Palaeobotany 4.1 Introduction to Palaeobotany 4.2 Geological time scale 4.3 Fossil formation process 4.4 Types of fossils - Compression, Impression, Petrification, Pith Cast, Coal balls	07
Reference Books: 1. Smith, G.M. "Cryptogamic Botany, Volume II: Bryophytes and Pteridophytes". New York: McGraw-Hill Book Company, 1955. 2. Parihar, N.S. "An Introduction to Embryophyta: Bryophyta". Allahabad: Central Book Depot, 1991. 3. Bhatnagar, S.P., and Moitra, A. "Gymnosperms". New Delhi: New Age International Publishers, 1996. 4. Sporne, K.R. "The Morphology of Gymnosperms". London: Hutchinson University Library, 1965. 5. Stewart, W.N., and Rothwell, G.W. "Paleobotany and the Evolution of Plants". Cambridge: Cambridge University Press, 1993.		
Evaluation Pattern:		
Total Marks: 50		
Internal Continuous Evaluation (20 Marks): • CCE - I: 10 Marks: Home Assignment • CCE - II: 10 Marks: Short and long answer questions Test/Seminar/Open Book Test/Quiz/Case study/Book review/Field work/ Industry visit • CCE- III: 10 marks: Compulsory MCQ test • (Note: Best of two CCE marks will be considered)		End Semester Examination (30Marks): • Question-1: Solve the following questions (five questions of 2 marks) 10 M • Question-2: Attempt any two questions (three questions of 10marks) 20 M • Question-3: Attempt any four questions (five questions of 5 marks) 20 M • Note: Conversion of 50 marks of ESE to 30 marks

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	Programme: B. Sc.	Semester – I
	Type: DSC IV	Marks: 50
	Credits: 2	From: A. Y. 2024-25
	Name of the Course: BBT 122: Fundamentals of Plant Taxonomy	

Course Objectives: By the end of the course, students will be able to:

1. Explain the basic concepts, importance, and functions of plant taxonomy.
2. Describe the principles and rules of botanical nomenclature.
3. Explain the tools and resources used in taxonomic studies.
4. Describe the systems of classification of angiosperms.

Course Outcomes: By the end of the course, students should be able to:

1. Explain the principles and functions of plant taxonomy.
2. Apply the rules of botanical nomenclature for plant identification.
3. Demonstrate the use of herbaria, botanical gardens, and taxonomic literature.
4. Compare the major systems of angiosperm classification.

Module	Title and Contents	Hrs.
Module 1	Module 1: Introductory Taxonomy 1.1 Introduction, Importance of Taxonomy 1.2 Functions of Taxonomy: Identification, Nomenclature, Classification 1.3 Ranks, Categories, and Taxonomic Groups	08
Module 2	Module 2: Botanical Nomenclature 2.1 Principles and rules (ICN); Salient features of International Code of Botanical Nomenclature (ICBN) 2.2 Binominal system, Typification, Author citation, Valid publication, Rejection of names, the principle of priority, and its limitations.	07
Module 3	Module 3: Tools for Taxonomic Studies 3.1 Herbarium: Introduction, Role, and Significance. 3.2 Botanical Gardens: Introduction, Role, and Significance. 3.3 Study of A. J. C. Bose Botanical Garden, Howrah; Lead Botanical Garden, Shivaji University, Kolhapur.	08

	3.4 Taxonomic literature – Flora, Monograph	
Module 4	Module 4: Systems of Classification of Angiosperms 4.1 General characters; Life cycle pattern in angiosperms 4.2 Systems of Classifications: Natural, Artificial, and Phylogenetic 4.3 Bentham and Hooker’s System of Classification (up to Series); Engler and Prantl System of Classification (up to Series)	07
Reference Books: 1. Singh, G. “Plant Systematics: Theory and Practice”. New Delhi: Oxford & IBH Publishing Co. Pvt. Ltd., 2019. 2. Sharma, O.P. “Plant Taxonomy”. New Delhi: McGraw Hill Education, 2017. 3. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F., and Donoghue, M.J. “Plant Systematics: A Phylogenetic Approach”. Sunderland: Sinauer Associates, 2016. 4. Pandey, B.P. “Taxonomy of Angiosperms”. New Delhi: S. Chand & Company Ltd., 2010. 5. Lawrence, G.H.M. “Taxonomy of Vascular Plants”. New York: Macmillan Publishing Company, 1951.		
Evaluation Pattern:		
Total Marks: 50		
Internal Continuous Evaluation (20 Marks): • CCE - I: 10 Marks: Home Assignment • CCE - II: 10 Marks: Short and long answer questions Test/Seminar/Open Book Test/Quiz/Case study/Book review/Field work/ Industry visit • CCE- III: 10 marks: Compulsory MCQ test • (Note: Best of two CCE marks will be considered)		End Semester Examination (30Marks): • Question-1: Solve the following questions (five questions of 2 marks) 10 M • Question-2: Attempt any two questions (three questions of 10marks) 20 M • Question-3: Attempt any four questions (five questions of 5 marks) 20 M • Note: Conversion of 50 marks of ESE to 30 marks

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	Board of Studies in Botany	
	Programme: B. Sc.	Semester – I
	Type: DSC P	Marks: 50
	Credits: 2	From: A. Y. 2024-25
	Name of the Course: Practical Course-BBP 123: Practical's based on Course Paper III and IV	

Course Objectives: By the end of the course, students will be able to:

1. Develop skills in identifying Bryophytes, Pteridophytes, Gymnosperms, and plant fossils.
2. Study vegetative and reproductive morphology of flowering plants.
3. Prepare botanical keys, herbarium specimens, and identify plants using flora.
4. Apply practical knowledge through botanical garden and field visits.

Course Outcomes: By the end of the course, students should be able to:

1. Identify representative cryptogams, gymnosperms, and fossil types.
2. Differentiate vegetative and reproductive characters of flowering plants.
3. Prepare herbarium specimens and botanical keys for plant identification.
4. Demonstrate plant identification skills using flora and field observations.

Practical No.	Title and Contents	No. of hours per practical
1.	Study of Bryophytes through representative members <i>Riccia</i> .	04
2.	Study of Bryophytes through representative members <i>Funaria</i> .	04
3.	Study of Pteridophytes through representative members <i>Selaginella</i> .	04
4.	Study of Pteridophytes through representative members <i>Pteris</i> .	04
5.	Study of Gymnosperms through representative members <i>Gnetum</i> .	04
6.	Study of Gymnosperms through representative members <i>Cycas</i> .	04
7.	Study of types of fossils (Compression, Impression, Petrification, Cast, and Coal Balls).	04
8.	Study of flowering twig morphology - Vegetative characters.	04

9.	Study of flowering twig morphology - Floral/reproductive characters.	04
10.	Preparation of botanical key using vegetative characters.	04
11.	Preparation of botanical key using reproductive characters.	04
12.	Study of preparation of herbarium.	04
13.	Study of use of flora for identification of plants.	04
14.	Visit to botanical garden.	04
15.	Field visit.	04

Reference Books:

1. Smith, G.M. "Cryptogamic Botany, Volume II: Bryophytes and Pteridophytes". New York: McGraw-Hill Book Company, 1955.
2. Bendre, A. 2010. Practical Botany. Rastogi Publications, Meerut.
3. Pande, B.P. 1979. Modern Practical Botany, Vol. I. S. Chand Publishers, New Delhi.
4. Pande, B.P. 1979. Modern Practical Botany, Vol. II. S. Chand Publishers, New Delhi.
5. Wallis, C.J. 1966. Practical Botany for Advanced Level and Intermediate Students. 5th Edition. William Heinemann Medical Books Ltd., London.

Evaluation Pattern:

Total Marks: 50

Internal Evaluation (20 marks):

- Journal: 10 Marks
- Students Performance: 10 Marks

End Semester Examination (30 Marks):

- 4 questions

Study Tour/ Excursion:

One teacher along with a batch not more than 20 students is taken for excursions to places of study interest, one in each term. If there are female students in a batch of sixteen, one additional lady teacher is permissible for excursion. Each excursion will not be more than 3 days during college working days. T.A. and D.A. for teachers and non-teaching staff participating in the excursions should be paid as per the rules. The tour report duly certified by the concerned teacher and the head of the department should be submitted at the time of practical examination