

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Name of Programme	B. Sc.
Level	UG
No. of Semesters	06
Year of Implementation	2023-24
Programme Specific Outcomes (PSO)	<ol style="list-style-type: none"> 1. Students will be able to recall details and information about the evolution, anatomy, morphology, systematics, genetics, physiology, ecology, and conservation of plants and all other forms of life such as Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms. 2. Students will be able to recall details of the unique ecological and evolutionary features of the local and Indian flora. 3. Students will be able to communicate effectively using oral and written communication skills. 4. Students will be able to generate and test hypotheses, make observations, collect data, analyze and interpret results, derive conclusions, and evaluate their significance within a broad scientific context.
Relevance of PSOs to the local, regional, national, and global developmental needs (200 words)	<p>The students, after completion of the course will be able to understand the diversity of plants from local, regional and national level with respect to various groups like Algae, Fungi, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms. The knowledge of floral diversity gained by the students will be helpful for the sustainable livelihood which is useful from local to global level.</p> <p>The students will also gain knowledge regarding the ecological and economic importance of vegetation throughout the world. The knowledge acquired by the students, regarding cultivation and processing of different varieties of agricultural crops, fruits, vegetables and other plants of commercial importance will be helpful in setting up of small scale industries and seeking jobs which will lead to improve the local , regional and national economy.</p> <p>Study of phytochemical analysis, extraction of essential oils from plant resources and study of microbial technology will make the students able to use the techniques effectively in the industry.</p> <p>The students will be able to analyze the local and regional environmental issues like pollution, waste disposal by studying ecology.</p> <p>The students will be able to establish the relationship between the modern and traditional and indigenous knowledge system of plants of the nation.</p>

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

The performance of the learners shall be evaluated into two parts. The learner's performance shall be assessed by Internal Assessment with 40% marks in the first part and by conducting the Semester End Examinations with 60% marks in the second part. **The allocation of marks for the Internal Assessment and Semester End Examinations are as shown below-**

A) Internal Assessment: 40 % (40 Marks)

Sr. No.	Particulars	Marks
1.	One Periodical Class Test / Online Examination	20
2.	Assignments	20
	Question Paper Pattern for Periodical Class Test/ Online Examination: Maximum Marks: 20 Duration: 50 Minutes Long answer questions/ Multiple Choice Questions	

B) Semester End Examination: 60% (60 Marks)

Duration: The examination shall be of 2 hours' duration. **Question Paper Pattern**

- 1. There shall be four questions.**
- 2. All questions shall be compulsory with internal options.**
- 3. Question may be subdivided into sub-questions a, b, c... and the allocation of marks depends on the weightage of the unit.**

Standard of Passing

The learner to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Internal Assessment & Semester End Examination. The learner shall obtain minimum of 40% marks (i.e. 16 out of 40) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 24 out of 60) separately, to pass the course and minimum of Letter Grade "P" in the project component, wherever applicable to pass a particular semester. A learner will be said to have passed the course if the learner passes the Internal Assessment & Semester End Examination together.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Performance grading

Letter grades and grading points:

Semester GPA/ Program CGPA Semester/Program	% of Marks	Alpha-Sign / Letter Grade Result
9.00-10.00	90.0 -100	O (Outstanding)
$8.00 \leq 9.00$	$80.0 \leq 90.0$	A+ (Excellent)
$7.00 \leq 8.00$	$70.0 \leq 80.0$	A (Very Good)
$6.00 \leq 7.00$	$60.0 \leq 70.0$	B+ (Good)
$5.50 \leq 6.00$	$55.0 \leq 60.0$	B (Above Average)
$5.00 \leq 5.50$	$50.0 \leq 55.0$	C (Average)
$4.00 \leq 5.00$	$40.0 \leq 50.0$	P (Pass)
Below 4.00	Below 40	F (Fail)
Ab (Absent)	-	Absent

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Name of the Course	Botany I- Plant Diversity I
Course Code	USBOT101
Class	F. Y. B. Sc.
Semester	01
No of Credits	02
Nature	Theory
Type	Core(Major)

Nomenclature: Plant Diversity I

Course Outcomes:

Students will be able to

CO1: Learn and differentiate between general characteristics of Chlorophyta, Phycomycetae and Hepaticae.

CO2: Identify and describe prescribed examples of algae, fungi and bryophytes.

CO3: Understand the economic importance of algae and fungi.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Curriculum:

**Semester I Paper I
Plant Diversity I**

Unit	Title	Learning Points	No of Lectures
1	Algae	Division Chlorophyta: Distribution, salient features, cell structure, pigments, reserve food, range of thallus, reproduction, economic importance. Structure, life cycle and systematic position of <i>Spirogyra</i>	10
2	Fungi	Division Phycomycetae: Classification, salient features Structure, life cycle and systematic position of <i>Rhizopus</i> . Economic importance of Fungi Modes of nutrition in Fungi: Saprophytism and Parasitism	10
3	Bryophyta	General characters of Hepaticae. Structure, life cycle and systematic position of <i>Riccia</i>	10

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Learning resources recommended:

1. College Botany Volume I and II Gangulee, Das and Dutta, Central Education Enterprises. 1989
2. Cryptogamic Botany Volume I and II , G M Smith , Mc-Graw Hill Publications., 1955
3. A text book on Fungi , O.P. Sharma, Tata Mc-Graw Hill Publications, 1989.
4. Botany for Degree Students: Algae, Vashishta B.RS.Chand Publications ., 2010.
5. Botany for Degree Students: Fungi, Vashishta B.R.,S.Chand Publications , 2010.
6. Botany for Degree Students: Bryophyta, Vashishta B.R.,S.Chand Publications, 2010 .

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Evaluation Pattern

Internal Evaluation: Theory course - 40 Marks

Method	Marks
Internal Evaluation Test	20
Assignment	20

Semester End Evaluation (Paper Pattern) - 60 Marks

Question No	Unit	Marks
1 A	All Units 6 MCQ	6
B	Answer in one or two sentences (Based on all units) any three	6
2	Long answer questions from Unit 1	16
3	Long answer questions from Unit 2	16
4	Long answer questions from Unit 3	16

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Name of the Course	Botany II- Form and function I
Course Code	USBOT102
Class	F. Y. B. Sc.
Semester	01
No of Credits	02
Nature	Theory
Type	Core

Nomenclature: Form and Function I

Course Outcomes:

Students will be able to

CO1: Draw and describe the general structure of plant cell, and cell organelles such as endoplasmic reticulum and nucleus.

CO2: Identify and describe the prescribed ecosystems.

CO3: Draw different types of energy flow models and types of ecosystems.

CO4: Understand the Mendelian and Post-Mendelian genetics.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Curriculum:

**Semester I Paper II
Form and Function I**

Unit	Title	Learning Points	No of Lectures
1	Cell Biology	General characters of plant cell: Cell wall, Plasma Membrane (bilayer lipid structure, fluid mosaic model) Ultra structure and function of cell organelles: Endoplasmic Reticulum and Nucleus.	10
2	Ecology	Energy Pyramids, Energy flow in an ecosystem Types of ecosystems : Aquatic and Terrestrial	10
3	Genetics	Phenotype and Genotype, Mendelian genetics - Monohybrid, Dihybrid; Test cross; Back cross ratios. Epistatic and Non-epistatic interactions; Multiple alleles	10

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Learning resources recommended

1. Genetics , P. Russel, Wesley Longman Inc. publishers. 1997.
2. Plant Physiology, Taiz and Zeiger, Sinauer Associates Inc. publishers 2014
3. Fundamentals of Ecology, E. P. Odum & G. W. Barrett:, Thompson Asia Pvt. Ltd. Singapore1953.
4. Cell and molecular Biology ,D. Robertis, Saunders Publication 1965.
5. Cell-biology, Genetics, Evolution and Ecology, P.K. Gupta. Rastogi Publications, 2011.
6. Cell biology, S. C. Rastogi, New Age International Publication,2005.
7. iGenetics- A Molecular Approach , P. J. Russell, Benjamin Cummings, U.S.A., 2010.
8. Ecology and environment, P. D. Sharma , Rastogi Publications, 2017.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Evaluation Pattern

Internal Evaluation: Theory course - 40 Marks

Method	Marks
Internal Evaluation Test	20
Assignment	20

Semester End Evaluation (Paper Pattern) - 60 Marks

Question No	Unit	Marks
1 A	All Units 6 MCQ	6
B	Answer in one or two sentences (Based on all units) any three	6
2	Long answer questions from Unit 1	16
3	Long answer questions from Unit 2	16
4	Long answer questions from Unit 3	16

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Name of the Course	Botany Practical
Course Code	USBOTP1
Class	F. Y. B. Sc.
Semester	01
No of Credits	02
Nature	Practical
Type	Core

Course outcomes:

Students will be able to

- CO1:** Identify and differentiate between members of Chlorophyta, Phycomycetae and Hepaticae.
- CO2:** Identify and describe the prescribed algae, fungi and bryophyte.
- CO3:** Understand the economic importance of algae and fungi.
- CO4:** Draw and describe the structure of different types of cell inclusions like starch grains, raphides, sphaeraphides, cystolith.
- CO5:** Differentiate between cell organelles such as endoplasmic reticulum and nucleus.
- CO6:** Distinguish the ecological adaptations in plants.
- CO7:** Analyze biological data by using biometric methods.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

	Semester I USBOTP1	L.	Cr
Sr. No.	Practicals Paper I- Plant Diversity I	30	1
1.	Study of stages in the life cycle of <i>Spirogyra</i> from fresh/ preserved material and permanent slides.		
2.	Economic importance of algae: <i>Ulva</i> (Biofuel), <i>Spirulina</i> (Neutraceutical), <i>Caulerpa</i> (Food) <i>Chlorella</i> (Nutraceutical)		
3.	Study of stages in the life cycle of <i>Rhizopus</i> from fresh/ preserved material and permanent slides.		
4.	Economic importance of Fungi: Yeast, <i>Rhizopus</i> , <i>Mucor</i> .		
5.	Study of stages in the life cycle of <i>Riccia</i> from fresh / preserved material. Part-I.		
6.	Study of stages in the life cycle of <i>Riccia</i> from fresh/ preserved material. Part-II.		
7.	Study of Starch grains (Potato and Rice) and Aleurone Layer (Maize)		
8.	Study of Cell inclusions: Cystolith (<i>Ficus</i>); Raphides (<i>Colocassia</i>); Sphaeraphides (<i>Opuntia</i>).		

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

	Practicals Paper II - Form and Function I	30	1
1.	Examining various stages of mitosis in root tip cells (<i>Allium</i>).		
2.	Identification of cell organelles with the help of photomicrograph: Endoplasmic Reticulum and Nucleus		
3.	Identification of plants adapted to different environmental conditions: Hydrophytes: Floating: Free floating (<i>Pistia /Eichornia</i>); Rooted floating (<i>Nymphaea</i>); Submerged (<i>Hydrilla</i>), Mesophytes (any common plant)		
4.	Hygrophytes (<i>Typha/Cyperus</i>), Xerophytes : Succulent (<i>Opuntia</i>); Woody Xerophyte (<i>Nerium</i>); Halophyte (<i>Avicennia pneumatophore</i>) No sections, only identification and description of specimens. Morphological adaptations only.		
5.	Frequency distribution, graphical representation of data- Frequency polygon, Histogram		
6.	Frequency distribution, graphical representation of data- Pie chart.		
07.	Study of Karyotypes: Human: Normal male and female.		

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Evaluation Pattern

Internal Evaluation: Practical course

Total marks 40

Continuous internal evaluation: 20 (10 marks per paper)

Each practical will have 05 marks as continuous internal evaluation. The distribution of 05 marks is as follows:

01 mark: attendance, 02 marks: methodology, 02 marks: analysis and result

The total marks of all practicals will be converted to 05 at the end of semester.

Additionally for practical paper I Journal will carry 05 marks and for practical paper II field report will be of 05 marks.

Internal Evaluation Test: 20 (10 marks per paper)

Semester End Evaluation (Practical exam Pattern)

Practical Paper I: 30 marks

Practical Paper II: 30 marks

a. Practical Paper I:

Question No	Unit	Marks
1	Algae, Fungi and Bryophyta	18
2	Cell inclusion: Starch grain, raphide, spheraphide and cystolith	04
3	Identify and describe	08

b. Practical Paper II:

Question No	Unit	Marks
1	Biostatistics	12
2	Cell biology	09
3	Identify and describe	09

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Skeleton Paper for External Practical Examination in Botany

Semester I Paper I (Skeleton Paper)

Time: 2 hrs

Total Marks: 30

- Q.1 Identify, classify and describe specimen A, B and C. Draw labeled sketches to support your observations. (18)
- Q.2 Mount and comment on cell inclusions in specimen D and E. Draw a neat labeled sketch. (04)
- Q.3 Identify and describe specimen/slide F, G. (08)

Key:

A: *Spirogyra* – Vegetative/Reproductive

B: *Rhizopus* - Vegetative/Asexual

C: *Riccia* – Vegetative/ Reproductive

D: Starch grain- Potato /Rice / Aleurone layer- Maize

E: *Ficus* / *Pistia*/ *Opuntia*

F: Economic importance of algae

G: Economic importance of fungi

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Semester I Paper II (Skeleton Paper)

Time: 2 hrs

Total Marks: 30

- Q.1. Perform the Biometry experiment A allotted to you. Record your observations and results. (12)
- Q.2. Prepare a squash of the given root tip B to show various stages of Mitosis. Draw neat labeled diagrams. (09)
- Q.3. Identify and describe specimen/slide/photomicrograph C, D and E. (09)

Key:

A: Any experiment in Biometry

B: Onion root tip

C: Photomicrograph of cell organelle

D: Hydrophyte/Xerophyte/Mesophyte/Halophyte/Hygrophyte

E: Karyotype

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Name of the Course	Botany I- Plant Diversity I
Course Code	USBOT201
Class	F. Y. B. Sc.
Semester	02
No of Credits	02
Nature	Theory
Type	Core

Nomenclature: Plant Diversity I

Course Outcomes:

Students will be able to

CO1: Identify and differentiate between pteridophytes, gymnosperms and angiosperms.

CO2: Identify and describe prescribed pteridophytes, gymnosperms and angiosperms.

CO3: Get knowledge regarding distinguishing characteristics of the prescribed families of angiosperms

CO4: Identify and differentiate the prescribed types of leaves and inflorescence.

CO5: Explain the economic importance of Pteridophyta, Gymnosperms and Angiosperms.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Curriculum:

**Semester II Paper I
Plant Diversity I**

Unit	Title	Learning Points	No of Lectures
1	Pteridophyta	General characteristics of Division Pterophyta Structure life cycle, systematic position and alternation of generations in <i>Nephrolepis</i> . Economic importance of Pterophyta.	10
2	Gymnosperms	Structure , life cycle, systematic position and alternation of generations in <i>Cycas</i> . Economic importance of Cycadophyta.	10
3	Angiosperms	Leaf: Simple leaf, types of compound leaf, leaf incisions, venation, phyllotaxy, types of stipules Leaf modifications: spine, tendril, phyllode Inflorescence: Racemose: Raceme, Spike, Catkin, Spadix, Panicle, Capitulum, Umbel Cymose: Monochasial, Dichasial, Polychasial Study of following families: Malvaceae, Amaryllidaceae.	10

Learning resources recommended

1. College Botany Volume I and II, H. Gangulee, A. Kar Central Education enterprises, 2011.
2. Cryptogamic Botany Volume I and II, G M Smith. Mc-Graw Hill Publications,1938.
3. Botany for Degree students – Pteridophytes , B.R. Vashistha, Sinha and Singh., S. Chand Publications , 2010.
4. A Textbook of Botany- Angiosperms, B P Pandey, S. Chand Publications,1987.
5. Gymnosperms, S. P. Bhatnagar , New age International publications,2013.
6. Taxonomy of Angiosperms , P. C. Vashistha , S. Chand Publications ,2001.
7. Plant Systematics, M. G. Simpson , Elsevier Academy Press, 2006.
8. Botany for Degree students – Gymnosperms, B.R. Vashistha , S.Chand Publications 2010.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Evaluation Pattern

Internal Evaluation: Theory course - 40 Marks

Method	Marks
Internal Evaluation Test	20
Assignment	20

Semester End Evaluation (Paper Pattern) - 60 Marks

Question No	Unit	Marks
1 A	All Units 6 MCQ	6
B	Answer in one or two sentences (Based on all units)any three	6
2	Long answer questions from Unit 1	16
3	Long answer questions from Unit 2	16
4	Long answer questions from Unit 3	16

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Name of the Course	Botany II- Form and function I
Course Code	USBOT202
Class	F. Y. B. Sc.
Semester	02
No of Credits	02
Nature	Theory
Type	Core

Nomenclature: Form and Function I

Course Outcomes:

Students will be able to

CO1: Learn and identify the plant tissues.

CO2: Understand the process of photosynthesis and differentiate between C₃, C₄ and CAM cycle.

CO3: Gain knowledge about the concept of medicinal botany, and differentiate between plant metabolites.

CO4: Identify and describe medicinal use and active constituents of prescribed medicinal plants in Grandma's Pouch.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Curriculum:

**Semester II Paper II
Form and Function I**

Unit	Title	Learning Points	No of Lectures
1	Anatomy	Types of permanent tissues: Simple and complex and their subtypes. Primary structure of dicot and monocot root, stem and leaf. Epidermal tissue system: types of hair, monocot and dicot stomata.	10
2	Physiology	Photosynthesis: Light reactions, photolysis of water, photophosphorylation (cyclic and non cyclic), carbon fixation phase (C ₃ , C ₄ and CAM pathways).	10
3	Medicinal Botany	Concept of primary and secondary metabolites, difference between primary and secondary metabolites. Grandma's pouch: Following plants have to be studied with respect to botanical source, plant part used, active constituents present and medicinal uses: <i>Acorus calamus</i> , <i>Zinziber officinale</i> , <i>Curcuma longa</i> , <i>Glycirrhis glabra</i> , <i>Helicteres isora</i> , <i>Santalum album</i> , <i>Trachyspermum ammi</i> , <i>Piper longum</i>	10

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Learning resources recommended

- Plant Physiology -Taiz and Zeiger Sinauer Associates Inc. publishers. 2002
- Fundamentals of Plant Physiology ,V. K. Jain ,S. Chand Publication 2010.
- A textbook of Plant Physiology and Biochemistry , S. K. Verma , S. Chand Publications ,2005.
- A textbook of Plant Physiology,V. Verma. , Ane books India , 2007.
- Plant anatomy, B. P. Pandey, S. Chand Publications ,2001.
- Useful plants of India,S. P. Ambasta , NISCAIR, New Delhi , 1986.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Evaluation Pattern

Internal Evaluation: Theory course - 40 Marks

Method	Marks
Internal Evaluation Test	20
Assignments	20

Semester End Evaluation (Paper Pattern) - 60 Marks

Question No	Unit	Marks
1 A	All Units 6 MCQ	6
B	Answer in one or two sentences (Based on all units) any three	6
2	Long answer questions from Unit 1	16
3	Long answer questions from Unit 2	16
4	Long answer questions from Unit 3	16

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Name of the Course	Botany Practical
Course Code	USBOTP2
Class	F. Y. B. Sc.
Semester	02
No of Credits	02
Nature	Practical
Type	Core

Course outcomes:

Students will be able to

CO1: Learn and differentiate between Pteridophytes, Gymnosperms and Angiosperms.

CO2: Identify the prescribed Pteridophytes , Gymnosperms and Angiosperms.

CO3: Understand the economic importance of Pteridophyta, Gymnosperms and Angiosperms.

CO4: Observe and distinguish between the primary structure of dicot and monocot stem and root.

CO5: Separate the components of a mixture using paper chromatography technique.

CO6: Detect the presence of tannins in plant samples.

CO7: Learn about the use of anthocyanin as a pH indicator.

CO8: Identify the components of Grandma's pouch prescribed in the syllabus.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

	Semester II USBOTP2	L.	Cr
Sr. No.	Practicals Paper I- Plant Diversity I	30	1
1.	Study of stages in the life cycle of <i>Nephrolepis</i> : Mounting of ramentum, hydathode, T.S. of rachis, T.S. of the pinna of <i>Nephrolepis</i> passing through sorus.		
2.	<i>Cycas</i> : T.S of leaflet (<i>Cycas</i> pinna), Megasporophyll, microsporophyll, coralloid root, microspore, L.S. of ovule of <i>Cycas</i> – all specimens to be shown.		
3.	Economic importance of Cycadophyta: <i>Cycas</i> , <i>Zamia</i> .		
5.	Leaf morphology: leaf apex, leaf margin, leaf base, leaf shapes.		
6.	Types of inflorescence: as per theory		
7.	Study of Family - Malvaceae		
8.	Study of Family -Amaryllidaceae		

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Practicals Paper II - Form and Function I		30	1
1.	Primary structure of dicot and monocot root.		
2.	Primary structure of dicot and monocot stem.		
	Dicot and monocot stomata		
3.	Epidermal outgrowths: with the help of mountings Unicellular: <i>Gossypium</i> / Radish Multicellular: <i>Lantana</i> / Sunflower Glandular: <i>Drosera</i> and Stinging: <i>Urtica</i> – only identification with the help of permanent slides. Peltate: <i>Thespesia</i> Stellate: <i>Erythrina</i> / <i>Sida acuta</i> / <i>Solanum</i> / <i>Helecteris</i> T-shaped: <i>Avicennia</i>		
4.	Separation of chlorophyll pigments by strip paper chromatography.		
5.	Separation of amino acids by paper chromatography.		
6.	Study of change in colour because of change in pH: Anthocyanin: suitable plant material.		
7.	Test for tannins from suitable plant material.		
8.	Identification of plants or plant parts for grandma's pouch as per theory.		

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Evaluation Pattern

Internal Evaluation: Practical course

Continuous internal evaluation: 10 marks per paper

Each practical will have 05 marks as continuous internal evaluation. The distribution of 05 marks is as follows:

01 mark: attendance, 02 marks: methodology, 02 marks: analysis and result

The total marks of all practicals will be converted to 05 at the end of semester.

Additionally for practical paper I Journal will carry 05 marks and for practical paper II field report will be of 05 marks..

Internal Evaluation Test: 10 marks per paper

Semester End Evaluation (Practical exam Pattern)

Paper I

Question No	Unit	Marks
1	Pteridophyta, Gymnosperms	10
2	Angiosperms	08
3	Identify and describe	12

Paper II

Question No	Unit	Marks
1	Chromatography	08
2 a	Anatomy	06
b	Anatomy	05
3	Grandma's pouch	06
4	Anthocyanin / tannins	05

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

F.Y. B.Sc. BOTANY PRACTICAL EXAMINATION

Semester II Paper I

Time: 2 hrs

Total Marks: 30

- Q.1 Identify, classify and describe specimen A and B. Draw labeled sketches to support your observations. (10)
- Q.2 Classify specimen C up to its family giving reasons. Give the floral formula. Draw L.S of flower and T.S of ovary. (08)
- Q.3 Identify and comment on D, E, F and G (12)

Key:

A: *Nephrolepis*

B: *Cycas*

C: Malvaceae/Amaryllidaceae

D: Leaf morphology

E: Inflorescence

F: Economic importance of gymnosperm

G: T.S. of Rachis

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

F.Y. B.Sc. BOTANY PRACTICAL EXAMINATION

Semester II Paper II

Time: 2 hrs

Total Marks: 30

- Q.1 Perform the given experiment 'A' allotted to you. Write the requirements, principle and record your observations and results. (08)
- Q. 2 a) Make a temporary stained preparation of T.S of specimen B. Draw a neat labeled sketch. (06)
- b) Mount the epidermal outgrowth/ stomata from specimen C. Draw a neat labeled sketch. (05)
- Q. 3 Identify the given specimens D and E and comment on its uses. (06)
- Q. 4 Perform the given experiment 'F' allotted to you. Write the requirements, principle and record your observations and results. (05)

Key:

A: Separation of amino Acid by paper chromatography/Separation of photosynthetic pigments by paper chromatography

B: Dicot stem/Dicot root/Monocot stem/Monocot root.

C: Epidermal outgrowth/stomata.

D and E: Plants from grandma's pouch.

F: Effect of pH on Anthocyanin/Test for Tannins

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

Footnote

For Algae, Fungi, Bryophyta and Pteridophyta G M Smith's classification should be followed.

For Gymnosperms Chamberlain's classification system should be followed

For Angiosperms Bentham and Hooker's Classification system should be followed.

Scheme of practical examination:

1. One External (Semester End Examination) of 60 marks. Duration: 2 hours.
2. One Practical at the end of Semester consisting of practical I: 30 marks and Practical II-30 marks but passing combined out of 60.
3. Two short field visits for habitat studies are compulsory.
4. Field work of not less than eight hours duration is equivalent to one period per week for a batch of 15 students.
5. A candidate will be allowed to appear for the practical examinations if he/she submits a certified journal of F.Y.B.Sc. Botany or a certificate from the Head of the department / Institute to the effect that the candidate has completed the practical course of F.Y.B.Sc. Botany as per the minimum requirements.
6. In case of loss of journal, a candidate must produce a certificate from the Head of the department /Institute that the practicals for the academic year were completed by the student. However, such a candidate will be allowed to appear for the practical examination, but the marks allotted for the journal will not be granted.
7. HOD's decision, in consultation with the Principal, shall remain final and abiding to all.

**R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24**

R. P. Gogate College of Arts and Science and R. V. Jogalekar College of Commerce,
(Autonomous) Ratnagiri.
Board of Studies in Botany
Syllabus for F. Y. B. Sc. Botany effective from year 2023-24

Footnote

For Algae, Fungi, Bryophyta and Pteridophyta G M Smith's classification should be followed.

For Gymnosperms Chamberlain's classification system should be followed

For Angiosperms Bentham and Hooker's Classification system should be followed.

Scheme of practical examination:

1. One External (Semester End Examination) of 60 marks. Duration: 2 hours.
2. One Practical at the end of Semester consisting of practical I: 30 marks and Practical II-30 marks but passing combined out of 60.
3. Two short field visits for habitat studies are compulsory.
4. Field work of not less than eight hours duration is equivalent to one period per week for a batch of 15 students.
5. A candidate will be allowed to appear for the practical examinations if he/she submits a certified journal of F.Y.B.Sc. Botany or a certificate from the Head of the department / Institute to the effect that the candidate has completed the practical course of F.Y.B.Sc. Botany as per the minimum requirements.
6. In case of loss of journal, a candidate must produce a certificate from the Head of the department /Institute that the practicals for the academic year were completed by the student. However, such a candidate will be allowed to appear for the practical examination, but the marks allotted for the journal will not be granted.
7. HOD's decision, in consultation with the Principal, shall remain final and abiding to all.

Date: 16/04/24

Place: Ratnagiri



Signature

Chairperson and HoD