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)	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)	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. 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. 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. The students will be able to analyze the local and regional environmental issues like pollution, waste disposal by studying ecology. The students will be able to establish the relationship between the modern and traditional and indigenous knowledge system of plants of the nation.

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 % (20 Marks)

Sr. No.	Particulars	Marks
1.	**One Periodical Class Test / Online Examination**	**10**
2.	**Assignments**	**10**
	Question Paper Pattern for Periodical Class Test/ Online Examination: Maximum Marks: 10 Duration: 50 Minutes Long answer questions/ Multiple Choice Questions	

B) Semester End Examination: 60% (30 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. 8 out of 20) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 12 out of 30) 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.

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	0 (Outstanding)
8.00 ≤ 9.00	80.0 ≤ 90.0	A+ (Excellent)
7.00 ≤ 8.00	70.0 ≤ 80.0	A (Very Good)
6.00 ≤ 7.00	60.0 ≤ 70.0	B+ (Good)
5.50 ≤ 6.00	55.0 ≤ 60.0	B (Above Average)
5.00 ≤ 5.50	50.0 ≤ 55.0	C (Average)
4.00 ≤ 5.00	40.0 ≤ 50.0	P (Pass)
Below 4.00	Below 40	F (Fail)
Ab (Absent)	-	Absent

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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.

ILO
Students will be able to
ILO 1: Understand and write General characteristics of Division Chlorophyta.
ILO 2: Justify systematic position
ILO 3: Draw schematic representation of alternation of generations in *Spirogyra.*
ILO 4: Elaborate Economic importance of Chlorophyta.
ILO 5: Understand and write General characteristics of Division Phycomycetae.
ILO 6: Justify systematic position
ILO 7: Draw schematic representation of alternation of generations in *Rhizopus*.
ILO 8: Elaborate Economic importance of Phycomycetae.
ILO 5: Understand and write General characteristics of Division Hepaticae.
ILO 6: Justify systematic position
ILO 7: Draw schematic representation of alternation of generations in *Riccia*.
ILO 8: Elaborate Economic importance of Hepaticae.

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 *Spirogyra*	**10**
2	**Fungi**	Division Phycomycetae: Classification, salient features Structure, life cycle and systematic position of *Rhizopus.* 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 *Riccia*	**10**

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 .

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks:20

Method	Marks
Class test	**10**
Assignment	**10**

B) Semester End Examination: Maximum Marks: 30

Question No. and Sub questions	Unit and sub unit (with number and title)	Type of Question	Marks
1 A	**I**	**Long answer questions (Any 1 out of 2)**	**06**
1 B	**I**	**Answer in brief (Any 1 out of 2)**	**04**
2 A	**II**	**Long answer questions (Any 1 out of 2)**	**06**
2 B	**II**	**Answer in brief (Any 1 out of 2)**	**04**
3 A	**III**	**Long answer questions (Any 1 out of 2)**	**06**
3 B	**III**	**Answer in brief (Any 1 out of 2)**	**04**

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.

ILO

Students will be able to

ILO 1: Understand and explain the general structure of plant cell.

ILO 2: Understand and explain the ultra-structure and function of cell organelles like endoplasmic reticulum and nucleus.

ILO 3: Understand and explain different types of energy pyramids and energy flow models.

ILO 4: Understand, differentiate and explain types of ecosystems.

ILO 5: Understand and explain the Mendelian genetics.

ILO 6: Understand and explain the Post-Mendelian genetics.

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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**

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.

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks:20

Method	Marks
Class test	**10**
Assignment	**10**

B) Semester End Examination: Maximum Marks: 30

Question No. and Sub questions	Unit and sub unit (with number and title)	Type of Question	Marks
1 A	**I**	**Long answer questions (Any 1 out of 2)**	**06**
1 B	**I**	**Answer in brief (Any 1 out of 2)**	**04**
2 A	**II**	**Long answer questions (Any 1 out of 2)**	**06**
2 B	**II**	**Answer in brief (Any 1 out of 2)**	**04**
3 A	**III**	**Long answer questions (Any 1 out of 2)**	**06**
3 B	**III**	**Answer in brief (Any 1 out of 2)**	**04**

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.

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

	Practicals Paper II - Form and Function I	30	1
1.	Examining various stages of mitosis in root tip cells (*Allium).*		
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 (*Pistia* /*Eichornia*); Rooted floating (*Nymphaea*); Submerged (*Hydrilla*), Mesophytes (any common plant)		
4.	Hygrophytes (*Typha*/*Cyperus*), Xerophytes : Succulent (*Opuntia*); Woody Xerophyte (*Nerium*); Halophyte (*Avicennia* pneumatophore) 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.		

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Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks: 20 marks

Method	Marks
Q. 1. Perform any 1 or 2 experiments from following - Mount and comment on cell inclusions in the given specimen. Draw a neat labeled sketch (Starch grain- Potato /Rice / Aleurone layer- Maize /*Ficus / Pistia/ Opuntia*) / Prepare a squash of the given root tip B to show various stages of Mitosis. Draw neat labeled diagrams (Onion root tip) **Q. 2. Identify and describe the given specimen.** (Economic importance of algae / Economic importance of fungi /Photomicrograph of cell organelle / Hydrophyte/Xerophyte/Mesophyte/Halophyte/Hygrophyte / Karyotype)	**10**
Class test	**10**

B) Semester End Examination: Maximum Marks: 30

a. Practical Paper:

Question No	Unit	Marks
1	**Algae, Fungi and Bryophyta**	**15**
2	**Biostatistics**	**07**
3	**Viva**	**04**
	Journal	**04**

Skeleton Paper for External Practical Examination in Botany

Semester I (Skeleton Paper)

Time: 3 hrs **Total Marks: 30**

Q. 1.	Identify, classify and describe specimen **'A', 'B' and 'C'**. Draw labeled sketches to support your observations.	**(15)**
Q. 2.	Perform the Biometry experiment **'D'** allotted to you. Record your observations and results.	**(07)**
Q. 3.	Viva	**(04)**
Q. 4.	Journal	**(04)**

Key:

A: *Spirogyra* – Vegetative/Reproductive

B: *Rhizopus* - Vegetative/Asexual

C: *Riccia* – Vegetative/ Reproductive

D: Any experiment in Biometry

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 pteriodophytes, 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 Pteriodophyta, Gymnosperms and Angiosperms.

ILO
Students will be able to
ILO 1: Understand and write General characteristics of Division Pterophyta
ILO 2: Justify systematic position
ILO 3: Draw schematic representation of alternation of generations in *Nephrolepis.*
ILO 4: Elaborate Economic importance of Pterophyta.
ILO 5: Understand Structure , life cycle, systematic position and
ILO 6: Learn systematic position
ILO 7: Draw schematic representation of alternation of generations in *Cycas.*
ILO 8: Elaborate Economic importance of Cycadophyta.
ILO 9: Differentiate plant parts and their modifications -Leaf: Simple leaf, types of compound leaf, leaf incisions, venation, phyllotaxy, types of stipules
ILO 10: Leaf modifications: spine, tendril, phyllode
ILO 11: Analyse Inflorescence:
Racemose: Raceme, Spike, Catkin, Spadix, Panicle, Capitulum, Umbel
Cymose: Monochasial, Dichasial, Polychasial
ILO12: Differentiate with respect to their morphology families: Malvaceae, Amaryllidaceae.

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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 *Nephrolepis.* Economic importance of Pterophyta.	**10**
2	**Gymnosperms**	Structure , life cycle, systematic position and alternation of generations in *Cycas.* 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.

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks:20

Method	Marks
Class test	**10**
Assignment	**10**

B) Semester End Examination: Maximum Marks: 30

Question No. and Sub questions	Unit and sub unit (with number and title)	Type of Question	Marks
1 A	**I**	**Long answer questions (Any 1 out of 2)**	**06**
1 B	**I**	**Answer in brief (Any 1 out of 2)**	**04**
2 A	**II**	**Long answer questions (Any 1 out of 2)**	**06**
2 B	**II**	**Answer in brief (Any 1 out of 2)**	**04**
3 A	**III**	**Long answer questions (Any 1 out of 2)**	**06**
3 B	**III**	**Answer in brief (Any 1 out of 2)**	**04**

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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 C_3, C_4 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.

ILO

Students will be able to

ILO 1: Differentiate Primary structure of dicot and monocot root, stem and leaf.
ILO 2: Analyse Epidermal tissue system: types of hair, monocot and dicot stomata.
ILO 3: Analyse Types of permanent tissues: Simple and complex and their subtypes.
ILO 4: Elaborate the process of Photosynthesis:
ILO 5: Draw Light reactions,
ILO 6: Justify photolysis of water,
ILO 7: Differentiate Photophosphorylation (cyclic and non cyclic),
ILO 8:-Analyse carbon fixation phase (C_3, C_4 and CAM pathways).
ILO 9:-Justify Concept of primary and secondary metabolites,
ILO 10: Differentiate between primary and secondary metabolites.
ILO 11:Analyse botanical source, plant part used in Grandma's pouch.
ILO 12: Justify active constituents present and medicinal uses of plants.

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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: *Acorus calamus, Zinziber officinale, Curcuma longa, Glycirrhiza glabra, Helicteres isora, Santalum album, Trachyspermum ammi, Piper longum*	**10**

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.

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks:20

Method	Marks
Class test	**10**
Assignment	**10**

B) Semester End Examination: Maximum Marks: 30

Question No. and Sub questions	Unit and sub unit (with number and title)	Type of Question	Marks
1 A	**I**	**Long answer questions (Any 1 out of 2)**	**06**
1 B	**I**	**Answer in brief (Any 1 out of 2)**	**04**
2 A	**II**	**Long answer questions (Any 1 out of 2)**	**06**
2 B	**II**	**Answer in brief (Any 1 out of 2)**	**04**
3 A	**III**	**Long answer questions (Any 1 out of 2)**	**06**
3 B	**III**	**Answer in brief (Any 1 out of 2)**	**04**

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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 Pteriodophytes, Gymnosperms and Angiosperms.
CO2: Identify the prescribed Pteriodophytes , Gymnosperms and Angiosperms.
CO3: Understand the economic importance of Pteriodophyta, 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.

	Semester II USBOTP2	**L.**	**Cr.**
Sr. No.	**Practicals Paper I- Plant Diversity I**	30	1
1.	Study of stages in the life cycle of *Nephrolepis* : Mounting of ramentum, hydathode, T.S. of rachis, T.S. of the pinna of *Nephrolepis* passing through sorus.		
2.	*Cycas:* T.S of leaflet (*Cycas* pinna), Megasporophyll, microsporophyll, coralloid root, microspore, L.S. of ovule of *Cycas* – all specimens to be shown.		
3.	Economic importance of Cycadophyta: *Cycas*, *Zamia.*		
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		

	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: *Gossypium* / Radish Multicellular: *Lantana* / Sunflower Glandular: *Drosera* and Stinging: *Urtica* – only identification with the help of permanent slides. Peltate: *Thespesia* Stellate: *Erythrina* / *Sida acuta* /*Solanum* /*Helecteris* T-shaped: *Avicennia*		
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.		

Evaluation Pattern

A) Continuous Internal Evaluation: Maximum Marks: 20 marks

Method	Marks
Q. 1. Perform any 1 or 2 experiments from following - Perform the given experiment allotted to you. Write the requirements, principle and record your observations and results (Separation of amino Acid by paper chromatography/Separation of photosynthetic pigments by paper chromatography) / Mount the epidermal outgrowth/ stomata from the given specimen. Draw a neat labeled sketch (Epidermal outgrowth/stomata) / Perform the given experiment allotted to you. Write the requirements, principle and record your observations and results (Effect of pH on Anthocyanin/Test for Tannins) **Q. 2. Identify and describe the given specimen.** (Leaf morphology / Inflorescence / Economic importance of gymnosperm / T.S. of Rachis / Plants from grandma's pouch)	**10**
Class test	**10**

B) Semester End Evaluation (Practical exam Pattern)

Question No	Unit	Marks
1	**Pteridophyta, Gymnosperms**	**08**
2	**Angiosperms**	**08**
3	**Anatomy**	**06**
4	**Viva**	**04**
5	**Journal**	**04**

F.Y. B.Sc. BOTANY PRACTICAL EXAMINATION

Semester II

Time: 3 hrs **Total Marks: 30**

Q. 1	Identify, classify and describe specimen **A** and **B**. Draw labeled sketches to support your observations.	**(08)**
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	Make a temporary stained preparation of T.S of specimen **D**. Draw a neat labeled sketch.	**(06)**
Q. 4	Viva	**(04)**
Q. 5	Journal	**(04)**

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Key:

A: *Nephrolepis*

B: *Cycas*

C: Malvaceae/Amaryllidaceae

D: Dicot stem/Dicot root/Monocot stem/Monocot root.

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

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

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