



**Hindi Vidya Prachar Samiti's**

**Ramniranjan Jhunjhunwala College**

**of Arts, Science & Commerce**

**(Autonomous College)**

**Affiliated to**

**UNIVERSITY OF MUMBAI**

**Syllabus for the F.Y.B.Sc.**

**Program: B.Sc. BOTANY**

**Program Code: RJSUBOT**

**(REVISED 2021-2022)**

**(CBCS 2021-2022)**

**F.Y.B.Sc Botany Syllabus Semester I & II****DISTRIBUTION OF TOPICS AND CREDITS****F.Y.B.Sc. BOTANY SEMESTER I**

<b>Course</b>	<b>Nomenclature</b>	<b>Credits</b>	<b>Topics</b>
RJSUBOT101	Plant Diversity I	02	1. Algae 2. Fungi 3. Bryophyta & Pteridophyta
RJSUBOTI02	Forms & Functions I	02	4. Cell Biology 5. Physiology & Biochemistry 6. Genetics
RJSUBOTP101 &RJSUBOTP102	Practical I & II	02	Algae, Fungi, Bryophyta, Pteridophyta, cell biology, physiology and Biochemistry, genetics

**F.Y.B.Sc. BOTANY SEMESTER II**

<b>Course</b>	<b>Nomenclature</b>	<b>Credits</b>	<b>Topics</b>
RJSUBOT201	Plant Diversity I	02	1.Lichens & Mycorrhiza 2. Gymnosperms 3. Angiosperms
RJSUBOT202	Forms & Functions I	02	4.Plant Anatomy 5.Ecology & Phytogeography 6.Medicinal Botany & Human Welfare
RJSUBOTP201 &RJSUBOTP202	Practical I & II	02	Lichens& Mycorrhiza, Gymnosperms, Angiosperms, plant anatomy, ecology & phytogeography, medicinal Botany &human welfare

<b>SEMESTER I (THEORY)</b>		<b>L</b>	<b>Cr</b>
<b>Paper-I: Plant Diversity I</b>	<b>Paper Code: RJSUBOT101</b>	45	2
<b>UNIT I</b>		15	
<b>ALGAE</b>			
1	General Characters of Cyanophyta. Cell structure and life cycle of <i>Nostoc</i>		
2	General characters of Chlorophyta based upon - Range of thallus, cell structure and types of chloroplasts, Reproduction. Economic importance of Chlorophyta. Life cycle of <i>Spirogyra</i> .		
3	Emerging areas of algal biotechnology- Single cell protein ( <i>Spirulina</i> ), Biofertilizers ( <i>Anabaena</i> ) , algae as food ( kelp), algae as industrial product ( Agar-agar and diatomite)		
<b>UNIT II</b>		15	
<b>FUNGI</b>			
1	General characters of Phycomycetes based on thallus structure and reproduction, Life cycle of <i>Rhizopus</i> .		
2	General characters of Ascomycetes, Life cycle of <i>Penicilium</i> and <i>Aspergillus</i> .		
3	Dermatophytes- causative organisms and control measures of candidiasis and dandruff		
<b>UNIT III</b>		15	
<b>BRYOPHYTA &amp; PTERIDOPHYTA</b>			
1	General characters of Hepaticae based on - Thallus structure, Reproduction. Life cycle of <i>Riccia</i>		
2	General characters of Pterophyta based on plant body and reproduction, Life cycle of <i>Nephrolepis</i>		

F.Y.BSc	Semester I Theory
RJSUBOT101	Course Outcomes 1.1 :
Paper I	
Plant Diversity I	<ol style="list-style-type: none"> <li>1. Introduce students to algae and let them explore the diversity in the thallus structure ranging from simple to complex. Learn the taxonomy of Cyanophyta and Chlorophyta represented by <i>Nostoc</i> and <i>Spirogyra</i>. Also create awareness about emerging trends in algal biotechnology through the study of SCP, use of algae as biofertilizers, algal food and industrial products derived from algae.</li> <li>2. Introduction to fungi from Phycomycetes form represented by <i>Rhizopus</i> to the Ascomycetes form represented by <i>Penicillium</i> and <i>Aspergillus</i>. Study of dermatophytes will bring awareness about prevention and control of diseases caused in human beings by fungi.</li> <li>3. Bryophytes amphibious habitat, features of bryophytes, general characters of Hepaticae and life cycle of widely available <i>Riccia</i>. First land plants Pteridophytes represented by the common ornamental fern, namely <i>Nephrolepis</i>.</li> </ol> <p>Learning outcomes:</p> <ul style="list-style-type: none"> <li>➤ Understanding the diversity of lower plants, its life cycle, type of chloroplast and application of algae for commercial purposes.</li> </ul>

**F.Y.B.Sc Botany Syllabus Semester I & II**

	<ul style="list-style-type: none"><li>➤ Detailed study of fungi life cycle, mode of nutrition and its selection for economic products.</li><li>➤ Detailed study of Bryophytes and Pteridophyte life cycle, types of thallus and alternation of generations. It will help students to understand the role of Bryophytes in plant succession.</li><li>➤ Conquest of land by Pteridophytes, transition of plants from aquatic life to terrestrial habitat.</li></ul>
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<b>SEMESTER I (THEORY)</b>		<b>L</b>	<b>Cr</b>
<b>Paper-II: Forms and Functions-I</b>	<b>Paper Code: RJSUBOT102</b>	45	2
<b>UNIT I</b>		15	
<b>CELL BIOLOGY</b>			
1	General structure of plant cell, Structure of Cell wall, Plasma membrane ( bilayer lipid structure, fluid mosaic model).		
2	Ultra structure and functions of the following cell organelles: Mitochondria and Microbodies.		
<b>UNIT II</b>		15	
<b>PHYSIOLOGY &amp; BIOCHEMISTRY</b>			
1	Plant Water Relations- Water Potential, Transport through membrane, Osmosis, Imbibition.		
2	Enzymes- Classification, mechanism of action (activation energy, lock and key hypothesis, induced-fit theory), Michaelis Menten equation, Enzyme inhibition.		
<b>UNIT III</b>		15	
<b>GENETICS</b>			
1	Extension of Mendelian genetic analysis- Multiple alleles, modification of dominance relationship, incomplete dominance & Co-dominance.		
2	Gene interaction and Modified Mendelian ratios, Epistasis		
3	Quantitative characters : Polygene Inheritance		

**F.Y.B.Sc Botany Syllabus Semester I & II**

F.Y.BSc	Semester I Theory
RJSUBOT102 Paper II Forms and Functions I	<p>Course Outcomes 1.2 :</p> <ol style="list-style-type: none"> <li>1. Introduction to cell Biology, ultrastructure of cell wall, plasma membrane, to understand the transport mechanisms via these membranes.</li> <li>2. Student will be able to understand the ultrastructure of mitochondria and microbodies so that they can correlate with the physiological functions of these organelles in the plant cell. understand the biochemical processes, study of enzymes is a prerequisite.</li> <li>3. To understand the concept of water transport in plant cells.</li> <li>4. To go beyond Mendelian inheritance and understand the concept of genetic interaction, epistatic interactions, multiple alleles and inheritance of blood groups in man. To understand how multiple genes are involved in inheritance of quantitative characters and their cumulative effect on expression of the character.</li> </ol> <p>Learning outcomes:</p> <ul style="list-style-type: none"> <li>➤ Basic concept of cell and its ultra microscopic structure of cell organelle.</li> <li>➤ Detailed study of enzymes nomenclature and functioning.</li> <li>➤ Detailed study of Mendelian genetics, multiple alleles and epistatic and non-epistatic interactions. Genetic basis of inheritance of quantitative characters</li> </ul>

<b>SEMESTER II (THEORY)</b>		<b>L</b>	<b>Cr</b>
<b>Paper-I: Plant Diversity I</b>	<b>Paper Code: RJSUBOT201</b>	45	2
<b><i>UNIT I</i></b>		15	
<b><i>LICHENS AND MYCORRHIZA</i></b>			
1	Lichens- Types of lichens, general characters, economic importance, ecological significance.		
2	Ecto- and endotrophic mycorrhiza and their agricultural applications.		
<b><i>UNIT II</i></b>		15	
<b><i>GYMNOSPERMS</i></b>			
1	General characters of Cycadophyta based upon - Plant body, Reproduction, Life cycle of <i>Cycas</i> .		
2	Economic importance of Gymnosperms.		
<b><i>UNIT III</i></b>		15	
<b><i>ANGIOSPERMS</i></b>			
1	Morphology- Leaf: simple leaf, types of compound leaves, Modifications of leaf: spine, tendril, hooks, phyllode, pitcher. Morphology of Seed – Monocot, Dicot and endospermic and non-endospermic seeds. Seed germination types.		
2	Taxonomy - Bentham and Hooker's classification – Broad outline upto series (with reasons). Study of plant families: Malvaceae, Leguminosae, Amaryllidaceae		



F.Y.BSc	Theory Semester II : Plant Diversity
RJSUBOT201 Plant Diversity -I	<p>Course Outcomes 2.1 :</p> <ol style="list-style-type: none"> <li>1. Study of Lichens students would be aware about plants as indicators of pollution, symbiotic relationship between algae and fungi, fungi and higher plant roots -mycorrhiza</li> <li>2. Student will be able to identify the characters, structure, life cycle of a commonly grown gymnosperm <i>Cycas</i>. Appreciate the economic importance of Gymnosperms.</li> <li>3. Morphological identification of leaves and seed morphology and seed germination so as to understand their function and taxonomic relevance. Seed morphology would help them understand the storage of primary metabolites; germination would enable them to develop skills needed for nursery.</li> <li>4. Bentham and Hooker's system of classification. Introduction to plant families by study of family Malvaceae, Leguminosae and Amaryllidaceae.</li> </ol> <p>Learning outcomes:</p> <ul style="list-style-type: none"> <li>➤ Detailed study of symbiotic association of algae and fungi –Lichen and role of mycorrhiza to improve plant nutrition.</li> <li>➤ Study of gymnosperms, life cycle, plant body and alternation of generations with help of <i>Cycas</i> as an example.</li> <li>➤ Understanding the type of modifications of leaves and morphology of seed for monocot and dicot. To apply the gained information to understand plant propagation and nutritional value of plant parts used as food.</li> <li>➤ Study of Bentham and Hooker's classification for Malvaceae, Leguminosae, Amaryllidaceae families</li> </ul>

<b>SEMESTER II (THEORY)</b>		<b>L</b>	<b>Cr</b>
<b>Paper-II: Forms and Functions-I</b>	<b>Paper Code: RJSUBOT202</b>	45	2
<b><i>UNIT I</i></b>		15	
<b><i>ANATOMY</i></b>			
1	Plant tissues:- Simple tissues, Complex tissues.		
2	Anatomy of primary structures – Dicot and Monocot root, stem and leaf.		
3	Adaptive and Protective systems- Epidermal tissue system, Trichomes, Dicot & Monocot Stomata.		
<b><i>UNIT II</i></b>		15	
<b><i>ECOLOGY &amp; PHYTOGEOGRAPHY</i></b>			
1	Ecosystem- abiotic and biotic components and their interactions, Types of ecosystems – aquatic and terrestrial, Energy flow in an ecosystem.		
2	Ecological pyramids: Based on energy, biomass and number.		
3	Phytogeographical divisions of India.		
<b><i>UNIT III</i></b>		15	
<b><i>MEDICINAL BOTANY AND HUMAN WELFARE</i></b>			
1	Introduction to Pharmacognosy- Biological source, geographical distribution, macro- and microscopic characters, chemical constituents, therapeutical uses of clove buds.		
2	Beverages- Cocoa: History, Origin, processing and production of chocolate.		

**F.Y.B.Sc Botany Syllabus Semester I & II**

F. Y. BSc	Theory Semester II : Plant Diversity
RJSUBOT202 Paper II Forms and Functions-I	<p>Course Outcomes 2.2 :</p> <ol style="list-style-type: none"> <li>1. Anatomy of plants, cells, tissues, salient characters of simple and complex tissues. Understand the primary structure of dicot and monocot root, stem and leaf. Students will be to differentiate dicot and monocot by using anatomical characters. Students will be able to apply this knowledge in identification of isolated plant organs.</li> <li>2. Study of epidermal outgrowths and stomata of dicot and monocot leaves.</li> <li>3. Ecology: Study of flow of energy at different trophic levels. Study of aquatic and terrestrial ecosystems, phytogeographical regions of India.</li> <li>4. Medicinal Botany and Human welfare: Introduction to pharmacognosy to identify plant based drugs with the help of macro and microscopic character and phytochemical qualitative tests with the help of clove. Introduction to economic Botany with <i>Theobroma cocoa</i> tree. Cocoa a popular beverage obtained by processing seeds of cocoa, popularity as a drink and chocolate.</li> </ol> <p>Learning outcomes:</p> <ul style="list-style-type: none"> <li>➤ Detailed study of anatomical structures of plant tissues, root, stem, leaf and types of epidermis, epidermal outgrowths and stomata.</li> <li>➤ Understand the ecological pyramids, energy flow, types of ecosystem and phytogeographical regions of India</li> <li>➤ Study of macro and microscopic characters of a plant drug clove and identification using phytochemical tests. Learn how cocoa is a processed and product used in production of popular chocolates.</li> </ul>

<b>F.Y.B.Sc Botany Syllabus Semester I &amp; II</b>		<b>L</b>	<b>Cr</b>
<b>Semester I (PRACTICALS)</b>			
<b>Practical-I: Plant Diversity I</b>		<b>Paper Code: RJSUBOTP101</b>	
			1
1	With the help of fresh/preserved specimens, identification of <i>Nostoc</i> .		
2	With the help of fresh/preserved specimens, identification of <i>Spirogyra</i> -vegetative stage, scalariform and lateral conjugation.		
3	<i>Rhizopus</i> - Study of asexual stage from temporary mounts and sexual structures through permanent slides.		
4	<i>Aspergillus</i> - Study of asexual stage from temporary mounts and sexual structures through permanent slides.		
5	Study of human yeast and <i>Malassezia globosa</i> (causative organism of dandruff) with the help of permanent slides.		
6	With the help of fresh/preserved specimens, study of life cycle stages in <i>Riccia</i> .		
7	With the help of fresh/preserved specimens, study of life cycle stages in <i>Nephrolepis</i> .		
<b>Practical-II: Forms and Functions I</b>		<b>Paper Code: RJSUBOTP102</b>	
			1
1	Study of mitotic stages in onion root tip.		
2	Study of Cell inclusions: Starch grains (Potato, Pea and Rice); Aleurone Layer (Maize) Cystolith ( <i>Ficus</i> ), Raphides ( <i>Pistia</i> ), Sphaeraphides ( <i>Opuntia</i> ).		
3	Identification of cell organelles with the help of photomicrograph: Mitochondria, Peroxisomes and Glyoxysomes.		
4	To study Plasmolysis using suitable plant material.		
5	Effect of change of pH on color of anthocyanin pigment and its applications		
6	Calculation of mean, median and mode.		
7	Calculation of standard deviation.		
8	Frequency distribution, graphical representation of data- frequency		

**F.Y.B.Sc Botany Syllabus Semester I & II**

	polygon, histogram, pie chart.		
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F.Y.B.Sc	Semester I
RJSUBOTP101 Practical - I	<p>Course Outcomes: Experiential learning, identification of algae and fungi by observing them under microscope</p> <ol style="list-style-type: none"> <li>1. Experiential learning of mounting and identification with the help of fresh/preserved material and permanent slides of <i>Spirogyra</i>. Vegetative and reproductive lateral and scalariform conjugation, <i>Nostoc</i>.</li> <li>2. Microscopic observation, mounting and identification of fresh/preserved material and permanent slides of <i>Rhizopus</i>, <i>Aspergillus</i> and <i>Penicillium</i>.</li> <li>3. Identification of causative organism of candidiasis and dandruff. Control measures zone of inhibition demonstration</li> <li>4. Study of morphological features and internal structure of <i>Riccia</i> with help of fresh /preserved material and permanent slides.</li> <li>5. Study of morphological and internal structure of <i>Nephrolepis</i> with the help of fresh/preserved material and permanent slides.</li> </ol> <p>Learning outcomes: Use of microscope, application of technique of microscopy</p> <ul style="list-style-type: none"> <li>➤ Understanding the diversity of lower plants.</li> <li>➤ Detailed study of life cycle of <i>Rhizopus</i>, <i>Aspergillus</i> and <i>Penicillium</i> so students can correlate with Aeromycoflora.</li> <li>➤ Detailed study of bryophyte's life cycle, types of thallus and gametophytes.</li> </ul>

**F.Y.B.Sc Botany Syllabus Semester I & II**

	<ul style="list-style-type: none"><li>➤ Detailed study of <i>Nephrolepis</i>, mounting of hydathode, ramentum, study of internal structure of stolon and sporophyll, mounting of sporangium and identification of prothallus.</li><li>➤ Create awareness and take precaution to prevent and or control skin diseases caused by fungi.</li></ul>
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**F.Y.B.Sc Botany Syllabus Semester I & II**

F.Y.B.Sc	Semester I
RJSUBOTP 102 Practical II	<p>Course Outcome:</p> <ol style="list-style-type: none"> <li>1. Squash preparation to study various stages of mitosis, learning the technique of chromosomal staining observation of stages of cell division.</li> <li>2. Slide preparation to study types of starch grains in potato, pea and rice. Mounting of aleurone layer from maize grain.</li> <li>3. Students would take transverse section of <i>Ficus elastica</i> leaf and observe under light microscope to look at cystolith, similarly other mineral crystals like raphides and sphaeraphides would be observed by taking transverse section of <i>Pistia</i> leaf and <i>Opuntia</i> phylloclade respectively. This would enable students to explore the diversity of cell inclusions in plants. Bio mineralization in plants</li> <li>4. Cell organelles would be studied using photomicrographs.</li> <li>5. Water relations of plants using coloured leaves like <i>Tradescantia</i> to explain concept of plasmolysis, incipient plasmolysis, hyper, hypo and isotonic solution. Understand use of natural pigments like anthocyanins as pH indicators.</li> <li>6. Introduction to biostatistics, sampling, central tendency calculation of mean, median and mode, graphical representation of data, frequency polygon, histogram, pie chart. Calculation of standard deviation.</li> </ol> <p>Learning outcomes:</p> <ul style="list-style-type: none"> <li>➤ Detailed study of different stages of mitosis, plasmolysis and cell inclusions.</li> <li>➤ Basic concept and functions of cell organelles.</li> <li>➤ Study the effect of change of pH on colour of anthocyanin pigment and its applications for other natural indicators.</li> <li>➤ To find the central tendency for any given data and calculation of standard deviation.</li> </ul>

**F.Y.B.Sc Botany Syllabus Semester I & II**

	➤ Data presentation with the help of frequency distribution, graphical representation of data- frequency polygon, histogram, pie chart.
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**F.Y.B.Sc Botany Syllabus Semester I & II**

<b>Semester II (PRACTICALS)</b>		<b>L</b>	<b>Cr</b>
<b>Practical-I:</b> <b>Plant Diversity</b> <b>-I</b>	<b>Paper Code: RJSUBOTP201</b>		1
1	Study of growth forms of lichens ( crustose, foliose, fruticose).		
2	Study of thallus and reproductive structures in lichen ( soredia and apothecium).		
3	Study of ecto mycorrhizae and endo mycorrhizae with the help of microphotographs/permanent slides.		
4	<i>Cycas</i> : T.S of leaflet ( <i>Cycas</i> pinna) and study of megasporophyll, microsporophyll, coralloid root, microspore and L.S. of ovule with the help of specimens/ slides.		
5	Simple leaf and types of compound leaves		
6	Study of leaf modification- spine, tendril, hooks, phyllode, pitcher		
7	Study of seed germination through growing of micro greens (Mini project for students).		
8	Family Malvaceae		
7	Family Leguminosae		
8	Family Amaryllidaceae		
<b>Practical-II:</b> <b>Forms and</b> <b>Functions-I</b>	<b>Paper Code: RJSUBOTP202</b>		1
1	Study of primary structure of dicot and monocot roots with the help of sectioning of fresh specimen.		
2	Study of primary structure of dicot and monocot stem with the help of sectioning of fresh specimen.		

**F.Y.B.Sc Botany Syllabus Semester I & II**

3	Study of primary structure of dicot and monocot leaf with the help of photograph/slide.		
4	Study of epidermal tissue system, trichome, dicot and monocot stomata.		
5	Study of plants from terrestrial and aquatic ecosystems – morphological adaptations- Hydrophytes, mesophytes, xerophytes, hygrophytes		
6	Study of phytogeographic regions of India with the help of map.		
7	Study of macroscopic and microscopic character of clove buds , Chemicals tests to identify its chemical constituents.		
8	Visit to Jijamata Udyan		
9	Visit to Cadbury factory at least virtual and Preparation of chocolate.		

**F.Y.B.Sc Botany Syllabus Semester I & II**

F.Y.B.Sc	Practicals Semester II
RJSUBOTP201  Practical I  Plant Diversity I	<p>Course Outcomes: Experiential learning, skill development</p> <ol style="list-style-type: none"> <li>1. Students would learn to observe specimens, identify with the help of morphological and anatomical characters. Understand symbiotic relationship in lichens and mycorrhiza. Learn the technique of sectioning and differentiate the tissues based on cell wall composition. Learn to observe different stages in the life cycle of <i>Cycas</i>.</li> <li>2. Study of leaf morphology and types of seed germination.</li> <li>3. An introduction to classification of flowering plants and study of families <i>Malvaceae</i>, <i>Leguminosae</i> and <i>Amaryllidaceae</i>.</li> </ol> <p>Learning outcomes:</p> <ul style="list-style-type: none"> <li>➤ Detailed study of <i>Cycas</i> pinna, Megasporophyll, Microsporophyll, Coralloid root, Microspore structure.</li> <li>➤ Understanding the morphology of roots, stems, leaves and morphology of seed for monocot and dicot.</li> <li>➤ Study of angiosperm families (<i>Malvaceae</i>, <i>Leguminosae</i> and <i>Amaryllidaceae</i>)</li> <li>➤ Field trips provide experiential learning to students.</li> </ul>

**F.Y.B.Sc Botany Syllabus Semester I & II**

F.Y.BSc	Practicals Semester II
RJSUBOTP202 Practical II Forms and Functions I	<p>Course Outcomes: Skill development</p> <ol style="list-style-type: none"> <li>1. Sectioning of dicot and monocot root, stem and leaves to study the primary structure. Mounting of epidermal outgrowths. Learner would learn technique of sectioning, staining. Types of epidermal outgrowth and its role in a plants life cycle.</li> <li>2. Based on observations of morphological characters plants would be identified as hydrophytes, mesophytes, hygrophytes and xerophytes. Characters to be observed for hydrophytes would be thin wiry stem, absence of roots (submerged), absence of root hair, roots with root pockets, lateral roots present, stem modified as offset, swollen petiole, leaves coated with wax ( free floating), roots with root hair, long petiole coated with mucilage, floating leaves coated with wax.</li> <li>3. Simple test for tannin's identification and botanical names of plants in everyday life to cure common ailments and scientific explanation for their curative properties.</li> </ol> <p>Learning outcomes:</p> <ul style="list-style-type: none"> <li>➤ Detailed study of anatomical structures of leaf, types of stomata and epidermal outgrowths.</li> <li>➤ Ecological study of plants. Morphological adaptations from terrestrial and aquatic ecosystems.</li> <li>➤ Macro and microscopic features and qualitative test to identify the phytochemicals in clove buds.</li> </ul>

## References

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2. A Textbook of Systematic Botany by Sutaria
3. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.
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26. Plummer, D.T. (1996). An Introduction to Practical Biochemistry. Tata McGraw-Hill Publishing Co. Ltd. New Delhi. 3rd edition.
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**Scheme of Examinations**

1. Two Internals of 20 marks each. Duration 30min for each.
2. One External (Semester End Examination) of 60 marks. Duration 2 hours.
3. One Practical at the end of Semester consisting of practical I-50 marks and Practical II-50 marks but passing combined out of 100.
4. Minimum marks for passing Semester End Theory and Practical Exam is 40 %.
5. Student must appear for at least one of the two Internal Tests to be eligible for the Semester End Examination.
6. For any KT examinations, there shall be ODD-ODD/EVEN-EVEN pattern followed.
7. Two short field excursions for habitat studies are compulsory.
8. Field work of not less than eight hours duration is equivalent to one period per week for a batch of 15students.
9. 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.
10. 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.
11. HOD's decision, in consultation with the Principal, shall remain final and abiding to all.

### **Evaluation and Assessment**

**Evaluation (Theory): Total marks per course - 100.**

**CIA- 40 marks**

**CIA 1: Written test -20 marks**

**CIA 2: Written Test / Assignment / Field Trip/mini project/ & Report -20 marks**

**Semester End Examination – 60 marks**

**Question paper covering all units**

**Evaluation of Practical's 100 marks ( 50 marks for each practical RJSUBOTP101& RJSUBOTP102, RJSUBOTP201 & RJSUBOTP202 )**

**Course Semester End Examination in Semester I and II Paper I and II  
( RJSUBOT101 & RJSUBOT102, RJSUBOT201 & RJSUBOT202)**

<b>Question</b>	<b>KNOWLEDGE</b>	<b>UNDERSTANDING</b>	<b>APPLICATION and ANALYSES</b>	<b>TOTAL MARKS- Per unit</b>
<b>Unit 1</b>	08	03	04	15
<b>Unit 2</b>	08	03	04	15
<b>Unit 3</b>	08	03	04	15
<b>Short notes from topics covering all the units</b>	08	03	04	15
<b>-TOTAL - Per objective</b>	32	12	16	<b>60</b>
<b>% WEIGHTAGE</b>	53	20	27	<b>100%</b>

**Evaluation of Practical's 100 marks ( 50 marks for each practical RJSUBOTP101& RJSUBOTP102, RJSUBOTP201 & RJSUBOTP202)**

Continuous Evaluation of components which require adequate duration for completion of the task,  
observation and interpretation: 25%

Course end Practical Evaluation of skills of students in terms of skill, analysis, interpretation and conclusion.



**ASSESSMENT OF BOTANY FIELD TRIP REPORT**

Dept. of Botany; Course Code \_\_\_\_\_ Date \_\_\_\_\_ Roll No \_\_\_\_\_

Name of student: \_\_\_\_\_ UID No \_\_\_\_\_ Marks \_\_\_\_\_/20

Place of visit \_\_\_\_\_

**Assessment Grid :** Place one tick in each appropriate row. Overall mark should reflect the positions of ticks in the individual rows

(20)	Field Trip and Report	80-100% 17-20 Marks	60-80% 13-16 Marks	40-60% 09-12 Marks	20-40% 05-08 Marks
30%  (06)	<b>Organization of report</b>	Introduction about the location, vegetation, Botanical Names, Family, Local name, Description using Botanical Term, reporting all the species seen, Handwritten or typed.  6	Few mistakes,  5	Many mistakes  4	Inadequate presentation  3
50%  (10)	<b>Content</b>	Excellent reporting of all the species observed in the field, ecological and morphological data,  10/9	Good reporting, species observed in the field but few of them missing in the list  8	Satisfactory, many species or relevant data missing from the report  6	Poor, inadequate and insufficient data or just a list of the species without any data.  5
10% (02)	<b>Conclusion</b>  ----Marks----	Conclusion based on self observation. Type of forest and vegetation  2	Good conclusion, comments not independent  2 / 1	Satisfactory, but insufficient  1 / 0.5	Poor, irrelevant conclusion  0.5
5% (01)	<b>References</b>  ----Marks----	Proper references, in required format  1	Proper references but no format  1	Few references  0.5	Irrelevant references  0
5% (01)	<b>Attendance / participation</b>  ----Marks----	Attended and participated actively  1	Attended and participated  1	Infrequent Participation  0.5	No participation  0

Comments:

Name and Signature of Faculty\_.

Mini Project Under graduate level

Dept. of\_\_\_\_\_Course Code\_\_\_\_\_Date \_\_\_\_\_

UIDNo\_\_\_\_\_Roll No\_\_\_\_\_Marks\_

\_\_\_\_\_/20 Name of student: \_\_\_\_\_

Title of Assignment: \_\_\_\_\_

**Assessment Grid :** Place one tick in each appropriate row. Overall mark should reflect the positions of ticks in the individual rows. In boxes that have more than one set of marks, cancel out the marks that are not applicable and circle the correct marks.

<b>Project work and report (Parameters)</b>	<b>Marks</b>	<b>80 – 100% Excellent</b>	<b>60 -80% Good</b>	<b>40 – 60% Satisfactory</b>	<b>20 – 40% Average</b>
Project work done	10	10 / 9	8 / 7	6 / 5	4 / 3
Report writing and conclusions	10	10 / 9	8 / 7	6 / 5	4 / 3

**F.Y.B.Sc Botany Syllabus Semester I & II**

Mapping of the course to employability/ Entrepreneurship/skill development

Class	Course Name	Course Code	Topic focussing on Employability/ Entrepreneurship/skill development	Employability/Entrepreneurship/Skill development	Specific activity
F Y B Sc Botany	Plant Diversity I	RJSUBOT101, RJSUBOT201	Plant Diversity I, II focuses on identification of industrially and environmentally useful algae, fungi, Bryophytes, Pteridophytes, Lichens and Mycorrhizae, Gymnosperms and Angiosperms	The topics focuses on identifying plants ranging from lower forms Thallophyta till Land plants. Applications of these types as nutraceuticals, agriculture	Preparation of biofertilizers
F Y B Sc Botany	Forms and Functions I	RJSUBOT201 RJSUBOT202	Concepts in Plant Anatomy, Biochemistry, Physiology, Genetics and Ecology which are essential to take up a career in research and teaching since these provide the Domain knowledge. Medicinal Botany gives a glimpse on plant based drugs and economically important products like cocoa which is used in production of popular beverage and chocolate	Employability in field of the teaching and research. To learn the techniques to identify plant based drugs.	
F Y B Sc Botany	Practicals	RJSUBOTP101 RJSUBOTP102 RJSUBOTP201 RJSUBOTP202	Microscopical identification of lower forms of plants, identification of higher forms	1. Analytical skills 2. Interpretation skills 3. Writing skills	Mini project for developing Entrepreneurial skills, Field trips enhances skills of

**F.Y.B.Sc Botany Syllabus Semester I & II**

			using morphological studies. Study of plants in different habitats and their adaptation. Plant pigments as natural pH indicator		identification of plants in situ, organisational skills, team work.
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