

**Rayat Shikshan Sanstha's  
Mahatma Phule Mahavidyalay, Pimpri, Pune-17  
Department of Botany 2021-22  
Course outcomes (Semester-wise)**

Name of the Department	Class	Course Name	Course code	Course Outcome
Botany	F.Y. B.Sc. (SEM I)	Botany I- Plant life and Utilization I	BO111	<p><b>CO1.</b> Student becomes aware about the plant diversity i.e. various plant groups such as Algae, Lichens, Fungi, Bryophytes, Pteridophytes, Gymnosperm and Angiosperms.</p> <p><b>CO2.</b> They understand the value of plant diversity by knowing the utilization of each plant group for human use as well as for maintenance of entire ecosystem and environment.</p>
		Botany II- Plant morphology and anatomy	BO112	<p><b>CO1.</b> Student gets the knowledge of different morphological characters of plants such as inflorescence, flower and its parts, fruits and seeds.</p> <p><b>CO2.</b> They know about how these morphological characters are useful in identification, nomenclature, classification, phylogeny and plant breeding</p> <p><b>CO3.</b> Student knows about the anatomical structure in plant system by studying different tissue systems in plants.</p>

		<b>Practical based on BO111 and BO112</b>	<b>BO113</b>	<b>CO1.</b> Student gets the Practical knowledge about different plant specimen by studying its morphological and anatomical characters.
	<b>F.Y. B.Sc. (SEM II)</b>	<b>Botany I- Plant life and Utilization II</b>	<b>BO121</b>	<b>CO1.</b> Students understand the detailed morphological and anatomical studies with reference to pteridophytes, gymnosperms and angiosperms.  <b>CO2.</b> They realize the utilization and ecological importance of these plant groups.
		<b>Botany II- Principles of plant science</b>	<b>BO122</b>	<b>CO1.</b> Student understands the concepts Plant physiology such as osmosis, diffusion, plasmolysis etc., plant cell structure and cell cycles in plants.  <b>CO2.</b> Student get knowledge about the structure of DNA and RNA its function and replication.
		<b>Practical based on BO121 and BO122</b>	<b>BO123</b>	<b>CO1.</b> Student gets the Practical knowledge about different plant specimen by studying its morphological and anatomical characters.  <b>CO2.</b> The practicals of physiology make them aware about how the plant performs its metabolic activities.  <b>CO3.</b> Student realize about how DNA and RNA can be isolated and quantified.
Botany	<b>S.Y. B.Sc.</b>	<b>Botany I- Taxonomy of</b>	<b>23141</b>	<b>CO1.</b> Students understand Plant descriptions, description of morphological and reproductive characters of plants and also identification and

	<b>(SEM I)</b>	<b>Angiosperm and plant ecology</b>		<p>classification and nomenclature of plant families of Angiosperm.</p> <p><b>CO2.</b> Students get knowledge of various systems of classification and botanical nomenclature.</p> <p><b>CO3.</b> Students understand environmental basic concept of ecology and know about plant adaptation according to different ecological conditions such as xerophytes, halophytes, mesophytes and succulents.</p>
		<b>Botany II- Plant physiology</b>	<b>23142</b>	<p><b>CO1.</b> Students get knowledge of basic concepts in plant physiology such as plant water relation, osmosis, imbibition, water absorption, transpiration and ascent of sap.</p> <p><b>CO2.</b> Student understand the concept of Nitrogen metabolism, seed dormancy and germination, physiology of flowering and vernalization.</p>
		<b>Botany III- Practical</b>	<b>23143</b>	<p><b>CO1.</b> Student gets the Practical knowledge about tools of taxonomy and ecological instruments and how to describe plant families and their economic importance.</p> <p><b>CO2.</b> Student gets the Practical knowledge of ecological adaptations in xerophytes and hydrophytes and study of vegetation by list count quadrat method.</p>

				<p><b>CO3.</b> The practicals of physiology make them aware about how the plant performs its metabolic activities.</p>
	<p><b>S.Y. B.Sc. (SEM II)</b></p>	<p><b>Botany I- Plant anatomy and embryology</b></p>	<p><b>24141</b></p>	<p><b>CO1.</b> Student realizes the anatomical structure of angiosperm with respect to Epidermal tissue system, Mechanical tissue system, Vascular tissue system, Normal secondary growth, Anomalous secondary growth.</p> <p><b>CO2.</b> They understand basic knowledge of microsporangium, mega sporangium, pollination and fertilization.</p> <p><b>CO3.</b> Students understands the concept of endosperm and embryo and embryo development and types of embryo.</p>
		<p><b>Botany II- Plant Biotechnology</b></p>	<p><b>24142</b></p>	<p><b>CO1.</b> Students know about introduction to plant Biotechnology, plant tissue culture and single cell protein.</p> <p><b>CO2.</b> Students understand basics of plant genetic engineering, genomics, proteomics and bioinformatics.</p> <p><b>CO3.</b> They aware about methods of bioremediation- microbial remediation and phytoremediation.</p> <p><b>CO4.</b> Students know about concept of biofuel technology- biogas, bioethanol, biobutanol, biodiesel and biohydrogen.</p>

		<b>Botany III- Practical</b>	<b>24143</b>	<p><b>CO1.</b> Student get the practical knowledge of the epidermal tissue system, mechanical tissue system, normal and anomalous secondary growth, embryonic development in plant system, tetrasporangiate anther and types of ovules.</p> <p><b>CO2.</b> Student get knowledge about laboratory instruments, preparation and sterilization of MS medium.</p> <p><b>CO3.</b> Students get practical knowledge of <i>Spirulina</i> cultivation and demonstration of transgenic crops and instruments of agarose gel electrophoresis, centrifuge and spectrophotometer.</p>
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### Short Term Course Outcomes:

<b>Name of the Department</b>	<b>Class</b>	<b>Course Name</b>	<b>Course Outcome</b>
<b>Botany</b>	<b>F.Y. B.SC.</b>	<b>Certificate course in Herbal cosmetics (Basic)</b>	<p><b>CO1.</b> Students Understand the basic techniques for standardization of extracts and their screening methods of herbs.</p> <p><b>CO2.</b> They able to Demonstrate and analyse the preparation of herbal soap, hair oil, face pack, hair conditioner, moisturiser and herbal hair dye</p> <p><b>CO3.</b> Student aware about different skin types and its relation to different face pack.</p>

			<b>CO4.</b> Exhibit and demonstrate the basic communication skills for marketing of products
<b>Botany</b>	<b>S.Y. B.Sc.</b>	<b>Certificate course in Herbal cosmetics (Advance)</b>	<p><b>CO1.</b> Students Understand the basic techniques for the preparation of herbal Keshranjak oil</p> <p><b>CO2.</b> They able to Demonstrate and analyse the preparation of Cleansing milk, orange cleansing milk and preparation of Herbal Aloe cream</p> <p><b>CO3.</b> Student aware about the ingredients for the preparation of Herbal moisturizer, Korphad jel</p> <p><b>CO4.</b> Students recognize the preparation of herbal Shikakai Shampoo, Herbal Utane and Herbal nutritive juices</p>