



# SAIVA BHANU KSHATRIYA COLLEGE

(Affiliated to Madurai Kamaraj University)

ARUPPUKOTTAI - 626101

## ANCILLARY BOTANY FOR ZOOLOGY MAJOR

### SYLLABUS

#### ANCILLARY BOTANY THEORY PAPER-I

<b>Department: ANCILLARYBOTANY</b>	
<b>Year: NOVEMBER/ DECEMBER OF EVERY YEAR</b>	<b>Semester: III (ODD)</b>
<b>Subject Name: PLANT DIVERSITY</b>	<b>Subject Code: SBYJA11</b>

Subject	Instructions		Examination		
	Hours/Week	Credits	Marks		
			Internal Assessment	Board Examination	Total
Ancillary Botany Theory Paper-I  Plant Diversity	4Hrs	4	25	75	100

Course Objectives	
On successful completion of the course the student will be able to	
1	<ul style="list-style-type: none"><li>Understand the basics &amp; general characters of various groups of lower plants</li></ul>
2	<ul style="list-style-type: none"><li>Study the Structure and life cycle of lower plants</li></ul>
3	<ul style="list-style-type: none"><li>Impart knowledge on the economic importance of lower plants</li></ul>

Unit No.	Content
1	<b>Unit I: Algae</b> <ul style="list-style-type: none"><li>Introduction, General Characters &amp; Economic Importance of Algae.</li><li>Structure and Life Cycle of <b>Oscillatoria</b>, <b>Oedogonium</b> and <b>Sargassum</b>.</li></ul>
2	<b>Unit II: Fungi</b> <ul style="list-style-type: none"><li>Introduction, General Characters &amp; Economic Importance of Fungi.</li><li>Structure and Life Cycle of <b>Aspergillus</b> and <b>Puccinia</b>.</li></ul>
3	<b>Unit III: Bryophytes</b> <ul style="list-style-type: none"><li>Introduction, General Characters &amp; Economic Importance of Bryophytes</li><li>Structure and Life Cycle of <b>Funaria</b>.</li></ul>
4	<b>Unit IV: Pteridophytes</b> <ul style="list-style-type: none"><li>Introduction, General Characters &amp; Economic Importance of Pteridophytes.</li><li>Structure and Life Cycle of <b>Selaginella</b></li></ul>
5	<b>Unit V: Gymnosperm</b> <ul style="list-style-type: none"><li>Introduction, General Characters &amp; Economic Importance of Gymnosperm.</li><li>Structure and Life Cycle of <b>Pinus</b>.</li></ul>

Course Outcome	
Students should able	
CO1	<ul style="list-style-type: none"> <li>To Understand the General Characters of Algae and the Structure and Reproduction of Algae -Oscillatoria, Oedogonium and Sargassum.</li> <li>To Know about the Economic Importance of Algae.</li> </ul>
CO2	<ul style="list-style-type: none"> <li>To Understand the General Characters of Fungi and the Structure and Reproduction of Fungi –Aspergillus and Puccinia.</li> <li>To Know about the Economic Importance of Fungi.</li> </ul>
CO3	<ul style="list-style-type: none"> <li>To Understand the General Characters of Bryophytes and the Structure and Reproduction of Funaria.</li> <li>To Know about the Economic Importance of Bryophytes.</li> </ul>
CO4	<ul style="list-style-type: none"> <li>To Understand the General Characters of Pteridophytes and the Structure and Reproduction of Selaginella.</li> <li>To Know about the Economic Importance of Pteridophytes.</li> </ul>
CO5	<ul style="list-style-type: none"> <li>To Understand the General Characters of Gymnosperm and the Structure and Reproduction of Pinus.</li> <li>To Know about the Economic Importance of Gymnosperm.</li> </ul>

REFERENC BOOKS
1. Chopra, R.N. and Kumara, P.K. (1988). <i>Biology of Bryophytes</i> . Wiley Eastern Ltd., New Delhi. 2. Rashid, A. (1998). <i>An Introduction to Bryophyta</i> . Vikas Publishing House (P) Ltd., New Delhi. 3. Sharma, O.P. (1990). <i>Textbook of Pteridophyta</i> . MacMillan India Ltd., New Delhi. 4. Sharma, O.P. (1997). <i>Gymnosperms</i> . PragatiPrakashan, Meerut. 5. Smith, G.M. (1955). <i>Cryptogamic Botany Vol. II Bryophytes and Pteridophytes</i> (2 Edn.). Tata McGraw-Hill Publishing Co., New Delhi. 6. Vashishta, B.R., Sinha, A.K. and Singh, V.P. (2008) <i>Botany for Degree Students: Algae</i> . S. Chand & Company Ltd., New Delhi. 7. Vashishta, B.R. (1990). <i>Botany for Degree Students: Fungi</i> . S. Chand & Company Ltd., New Delhi.

## ANCILLARY BOTANY THEORY PAPER-II

<b>Department: ANCILLARY BOTANY</b>	
<b>Year: APRIL/MAY OF EVERY YEAR</b>	<b>Semester: IV (EVEN)</b>
<b>Subject Name: PLANT ECOLOGY &amp; APPLIED BOTANY</b>	<b>Subject Code: SBYJA21</b>

Subject	Instructions		Examination		
	Hours/Week	Credits	Marks		
	4 Hrs	4	Internal Assessment	Board Examination	Total
Ancillary Botany Theory Paper-II Plant Ecology & Applied Botany			25	75	100

### Course Objectives

On successful completion of the course the student will be able to

1	<ul style="list-style-type: none"><li>Understand the concept of Plant Ecology, Plant adaptations, Vegetation of Tamil Nadu.</li></ul>
2	<ul style="list-style-type: none"><li>Learn the techniques of Mushroom Cultivation and Plant Tissue Culture</li></ul>
3	<ul style="list-style-type: none"><li>Know biofertilizers, mycorrhiza and organic farming</li></ul>

Unit No.	Content
1	<b>Plant Ecology</b> <b>Unit I:</b> <ul style="list-style-type: none"><li>Introduction, concept &amp; terminology</li><li>Plant adaptations – morphological, anatomical &amp; physiological adaptations of hydrophytes, xerophytes, halophytes</li><li>Vegetation of Tamilnadu; Methods of studying vegetation – quadrat.</li></ul>
2	<b>Applied Botany</b> <b>Unit II:</b> <ul style="list-style-type: none"><li><b>Mushroom Cultivation</b> Introduction, nutritive value, importance; cultivation of white button mushroom (<i>Agaricus</i> sp.) – spawn preparation - preservation of mushroom.</li></ul>
3	<b>Unit III:</b> <ul style="list-style-type: none"><li><b>Plant Tissue Culture</b> Introduction, basic requirements for tissue culture laboratory, basic tissue culture techniques &amp; applications of plant tissue culture.</li></ul>
4	<b>Unit IV:</b> <ul style="list-style-type: none"><li><b>Biofertilizers</b> Biofertilizers – Definition, kinds of microbes as biofertilizers, Rhizobium-legume Symbiotic association, Mycorrhiza – VAM association.</li></ul>
5	<b>Unit V:</b> <ul style="list-style-type: none"><li><b>Organic Farming</b> Methods of compost preparation &amp; Biodiesel production from Jatropha.</li></ul>

<b>Course Outcome</b>	
<b>Students should able</b>	
CO1	<ul style="list-style-type: none"> <li>To Understand the Different Concepts of Ecosystem</li> </ul>
CO2	<ul style="list-style-type: none"> <li>To Recognize the Adaptation of Hydrophytes, Xerophytes and Halophytes.</li> </ul>
CO3	<ul style="list-style-type: none"> <li>To Know the Different Kinds vegetation in Tamil Nadu and also the Methods of Study of Vegetation.</li> </ul>
CO4	<ul style="list-style-type: none"> <li>To Know the Different Steps in Tissue Culture and their Application.</li> </ul>
CO5	<ul style="list-style-type: none"> <li>To Develop Life Skill in the Cultivation Of Mushroom and Preparation of Biofertilizers, Compost and Biofuel</li> </ul>

REFERENC BOOKS
1. Kumar, H.D. (1992). <i>Modern Concepts of Ecology</i> (7th Edn.). Vikas Publishing Co., New Delhi.
2. Arumugam, N. (1994). <i>Concepts of Ecology</i> (Environmental Biology). Saras Publications, Nagercoil, Tamilnadu.
3. Alice, D., Muthusamy and Yesuraja, M. (1999). <i>Mushroom Culture</i> . Agricultural College, Research Institute Publications, Madurai. 3.
4. Marimuthu, T. (1991). <i>Oyster Mushroom</i> . Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
5. Nita Bhal (2000). <i>Handbook on Mushrooms Vol. I and II</i> (2nd Ed.). Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
6. Pathak, V.N. and Yadav, N. (1998). <i>Mushroom Production and Processing Technology</i> . Agrobios, Jodhpur.
7. Tripathi, D.P. 2005. <i>Mushroom Cultivation</i> . Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
8. Kalyan Kumar De. (1997). <i>Plant Tissue culture</i> . New central Book Agency, Calcutta.
9. Kumar, H.D. (1991). <i>A Textbook on Biotechnology</i> . East west press, New Delhi.
10. Parihar, P. (2014). <i>A Textbook of Biotechnology</i> . Argobios Publications, Jodhpur
11. Purohit, S.S. (2003). <i>Agricultural Biotechnology</i> . Agrobios Publications, Joshpur.
12. Varma, A. and Hock, B. (1995). <i>Mycorrhiza</i> . Springer–Verlag, Berlin.
13. YaacoVokan (1994). <i>Azospirillum/Plant Associations</i> . CRC Press, Boca Raton, FL.

## **ANCILLARY BOTANY THEORY PAPER-III**

<b>Department: ANCILLARY BOTANY</b>	
<b>Year: NOVEMBER/ DECEMBER OF EVERY YEAR</b>	<b>Semester: V (ODD)</b>
<b>Subject Name: Taxonomy, Embryology of Angiosperms &amp; Medicinal Botany</b>	<b>Subject Code: SBYJA31</b>

Subject	Instructions		Examination		
Ancillary Botany Theory Paper-III Taxonomy, Embryology of Angiosperms & Medicinal Botany	Hours/Week	Credits	Marks		
	4 Hrs	4	Internal Assessment	Board Examination	Total
			25	75	100

Course Objectives	
On successful completion of the course the students will be able to	
1	<ul style="list-style-type: none"> <li>Know systems of classifications, merits and demerits.</li> </ul>
2	<ul style="list-style-type: none"> <li>Understand the systematic of the selected families of the flowering plants with their economic importance.</li> </ul>
3	<ul style="list-style-type: none"> <li>Learn the medicinal important plants with their systematic treatment.</li> </ul>
4	<ul style="list-style-type: none"> <li>Understand the key aspects of embryology of Angiosperms</li> </ul>

Unit No.	Content
1	<b>Unit I:</b> <ul style="list-style-type: none"> <li>Introduction to basic morphology – Bentham and Hooker classification – Merits and demerits.</li> </ul>
2	<b>Unit II:</b> <ul style="list-style-type: none"> <li>A detailed study of the following families with their economic importance – Annonaceae, Rutaceae and Caesalpiniaceae</li> </ul>
3	<b>Unit III:</b> <ul style="list-style-type: none"> <li>A detailed study of the following families with their economic importance – Asclepiadaceae, Lamiaceae, Euphorbiaceae and Poaceae</li> </ul>
4	<b>Unit IV:</b> <ul style="list-style-type: none"> <li>Medicinal Botany: Study the systematic position, common names, description of individual plant, Morphology of useful part and curative properties of following plants: <i>Aegle marmelos</i>, <i>Azadirachta indica</i>, <i>Ocimum sanctum</i>, <i>Coriandrum sativum</i></li> </ul>

Unit No.	Content
	<i>Phyllanthus niruri</i> and <i>Gloriosa superba</i>
5	<b>Unit V:</b> <ul style="list-style-type: none"> <li>Embryology – Structure and development of anther, microsporogenesis&amp; male gametophyte - Structure, development of ovule &amp; megasprogenesis, female gametophyte (<i>Polygonum</i> type of embryo sac development), Fertilization, Structure of embryo – Dicot and Monocot.</li> </ul>

Course Outcome	
Students should able	
CO1	<ul style="list-style-type: none"> <li>To Acquire the Knowledge of Morphology of Root, Stem, Leaf, Inflorescence, Flowers, Fruits and Seeds for the Technical Description of Plant</li> </ul>
CO2	<ul style="list-style-type: none"> <li>To Practice the Technical Description of Selected Families – Nymphaeaceae, Rutaceae, Caesalpiniaceae, Asclepiadaceae, Lamiaceae, Euphorbiaceae and Poaceae</li> </ul>
CO3	<ul style="list-style-type: none"> <li>To Understand the Structure and Development of Anther, Pollen, Male Gametophyte, Ovule, Embryo Sac and Embryo</li> </ul>
CO4	<ul style="list-style-type: none"> <li>To Analyses the Systematic Position, Morphology and Medicinal Uses of Beal Tree, Neem, Coriander, Malabar Lily, Holy Basil and Stone Breaker</li> </ul>
CO5	<ul style="list-style-type: none"> <li>To Find Solutions from Medicinal Plants for Health Problems, Disorders and Disease of Human Beings</li> </ul>

REFERENC BOOKS
1. Agarwal, O.P. (2014). <i>Organic Chemistry Natural Products, Vol. II</i> . Krishna Prakashan Media (P) Ltd., Meerut
2. Bhojwani, S.S. and Bhatnagar, S.P. (2000). <i>The Embryology of Angiosperms</i> (4th Edition). Vikas Publishing House (P) Ltd., UBS Publisher's Distributors, New Delhi. 2269
3. Chopra, R.N., Badhuvar, R.L. and Gosh, G. (1965). <i>Poisonous Plants of India</i> . CSIR Publications, New Delhi.
4. Chopra, R.N., Chopra, I.C., Handa, K.L. and Kapur, L.D. (1994). <i>Indigenous Drugs of India</i> . IBH Publishing Co. Pvt. Ltd., New Delhi.
5. Gamble, J. S. and Fisher, C.E.C. (1915-1938). <i>Flora of the Presidency of Madras</i> . Adlard & Son Ltd., London
6. Maheswari, P. (1985). <i>An Introduction to the Embryology of Angiosperms</i> . Tata McGraw Hill Publishing Co. Ltd., New Delhi.
7. Mathew, K.M. (1988). <i>Flora of the Tamilnadu Carnatic</i> . Rapinat Herbarium, Tiruchirappalli.
8. Nair, N.C. and Henry, A.M. (1983). <i>Flora of Tamil Nadu, India</i> . Botanical Survey of India.
9. Pandey, B.P. (1997). <i>Taxonomy of Angiosperms</i> . S. Chand & Company Pvt. Ltd., New Delhi.
10. Sharma, O.P. (2007). <i>Plant Taxonomy</i> . Tata McGraw-Hill Publishing Co., New Delhi.
11. Somasundaram, S. (1997). <i>Medicinal Botany (MaruthuvaThavaraviyal)</i> (Tamil Medium Book). Elangovan Publishers, Tirunelveli.
12. Srivastava, A.K. (2006). <i>Medicinal Plants</i> . International Book distributors, Dehradun.

# ANCILLARY BOTANY THEORY PAPER-IV

<b>Department: ANCILLARY BOTANY</b>	
<b>Year: APRIL/MAY OF EVERY YEAR</b>	<b>Semester: VI (EVEN)</b>
<b>Subject Name: Plant Physiology &amp; Horticulture</b>	<b>Subject Code: SBYJA41</b>

Subject	Instructions		Examination		
Ancillary Botany Theory Paper-IV Plant Physiology & Horticulture	Hours/Week	Credits	Marks		
	4 Hrs	4	Internal Assessment	Board Examination	Total
			25	75	100

Course Objectives	
On successful completion of the course the students will be able to	
1	<ul style="list-style-type: none"> <li>Understand the metabolic activities of plants</li> </ul>
2	<ul style="list-style-type: none"> <li>Learn the horticultural practices, tools and manures.</li> </ul>
3	<ul style="list-style-type: none"> <li>Relate the kitchen garden and ornamental garden.</li> </ul>
4	<ul style="list-style-type: none"> <li>study the importance of horticultural crops and their propagation methods</li> </ul>

Unit No.	Content
1	<b>Plant Physiology</b> <b>Unit I:</b> <ul style="list-style-type: none"> <li>Absorption of Water - imbibition, diffusion, osmosis, plasmolysis, site of absorption, mechanism – active &amp; passive &amp; factors; Ascent of Sap -path and mechanism; Transpiration (Water Loss) - types, functions, mechanism &amp; factors; Photosynthesis- Structure of chloroplast, Mechanism - Light and Dark reaction (C3 &amp; C4 cycle only) &amp; factors.</li> </ul>
2	<b>Unit II:</b> <ul style="list-style-type: none"> <li>Respiration- Structure of Mitochondria, Mechanisms of respiration - Glycolysis and Krebs' cycle, Electron transport system &amp; factors. Plant Growth Regulators – Auxins, Gibberellins, Cytokinins, Absciscic acid and Ethylene</li> </ul>
3	<b>Horticulture</b> <b>Unit III:</b> <ul style="list-style-type: none"> <li>Introduction, Basic requirements, kinds of manures, Methods of vegetative Propagations, Cuttge, Layerage and Graftage.</li> </ul>
4	<b>Unit IV:</b> <ul style="list-style-type: none"> <li>Planning and Layout of Kitchen Gardening &amp; Orchard; Indoor gardening &amp; Hanging pots.</li> </ul>
5	<b>Unit V:</b> <ul style="list-style-type: none"> <li>Bonsai, Rockery and Methods of storage of Fruits.</li> </ul>



<b>Course Outcome</b>	
<b>Students should able</b>	
CO1	<ul style="list-style-type: none"> <li>To Know Importance and Scope of Plant Physiology.</li> </ul>
CO2	<ul style="list-style-type: none"> <li>To Know the Different Physiological Function of Plant</li> </ul>
CO3	<ul style="list-style-type: none"> <li>To Understand the Concept and Mechanism of Absorption, Ascent of Sap, Transpiration, Photosynthesis, Respiration and the Role of Plant Growth Regulators</li> </ul>
CO4	<ul style="list-style-type: none"> <li>To Understand the Horticulture Techniques like Cutting, Layering and Grafting.</li> </ul>
CO5	<ul style="list-style-type: none"> <li>To Know about the Planning and Layout of Kitchen Gardening, Orchard, Indoor Gardening and Hanging Pots, Bonsai, Rockery and Methods of Storage of Fruits.</li> </ul>

<b><u>REFERENC BOOKS</u></b>
1. Jain, V.K. (1990). <i>Fundamentals of Plant Physiology</i> . S. Chand & Co., New Delhi. 2. Pandey, S.N. (1991). <i>Plant Physiology</i> . Vikas Publishing House (P) Ltd., New Delhi. 3. Kumar, N. (1997). <i>Introduction to Horticulture</i> . Rajalakshmi Publications, Nagercoil. 4. Edmond, J.B., Musser, A.M. and Andrews, F.S. (1951). <i>Fundamentals of Horticulture</i> . McGraw-Hill Book Company, Inc., New York

## **ANCILLARY BOTANY -PRACTICAL**

### **ANCILLARY BOTANY PRACTICAL -I**

<b>Department:ANCILLARY BOTANY</b>	
<b>Year: MARCH/ APRIL OF EVERY YEAR</b>	<b>Semester: IV (EVEN)</b>
<b>Subject Name:Plant diversity, Plant Ecology &amp; Applied Botany</b>	<b>Subject Code: SBYJA2P</b>

Subject	Instructions		Examination		
	Hours/Week	Credit	Marks		
			Internal Assessment	Board Examination	Total
ANCILLARY BOTANY PRACTICAL -I  Plant diversity, Plant Ecology & Applied Botany	2Hrs	1	40	60	100

Syllabus	
1	Micro preparation of plants mentioned in plant diversity part of the syllabus.
2	Section cuttings and submission of slides-Selaginella and Pinus.
3	Spotters – Identification of specimens or slides from Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms include in the syllabus.
4	Comment on the ecological adaptations of the hydrophytes, xerophytes and halophytes
5	Maintenance of observation notebook and submission of the same during practical examination.

## **ANCILLARY BOTANY PRACTICAL -II**

<b>Department: ANCILLARY BOTANY</b>	
<b>Year: MARCH/ APRIL OF EVERY YEAR</b>	<b>Semester: VI (EVEN)</b>
<b>Subject Name: Taxonomy, Embryology of Angiosperms, Medicinal Botany, Plant Physiology and Horticulture</b>	<b>Subject Code: SBYJA4P</b>

Subject	Instructions		Examination		
	Hours/Week	Credit	Marks		
			Internal Assessment	Board Examination	Total
<b>ANCILLARY BOTANY PRACTICAL -II</b>  Taxonomy, Embryology of Angiosperms, Medicinal Botany, Plant physiology and Horticulture	2Hrs	1	40	60	100

Syllabus	
1	To make dissections using dissection microscope of the floral parts of Angiosperms Plants and to make drawing to bring out the salient feature [floral diagram also expected] to learn to mount the floral parts on a given slide.
2	To assign the given plants to its natural order giving reasons.
3	To describe plants in technical terms.
4	Identification of medicinal plants and records their morphological features. \
5	Identification of sections of anther and ovule.
6	Propagation methods of horticulture plants – Cuttage, Layerage and Graftage.
7	Demonstration of techniques of Horticulture.
8	To describe simple setups in plant physiology (Experiment setups)
9	To maintain an observation notebook and to submit it for external valuation