SEMESTER - III				
Allied I Angiosperm Taxonomy and Medicinal Botany				
18UBOA31	Hrs / Week: 4	Hrs / Semester: 60	Credits: 3	

Vision:

- To understand the taxonomy and medicinal values of selected plants **Mission:**
 - To study the floral characters with an aim to identify the taxa.
 - To know the importance of medicinal plant diversity

Course Outcome:

CO.No.	Upon completion of this course, students will be able	Pos	CL
00.100	to	addressed	
CO-1	able to recall the botanical names and to recognanise the	1	Un
	principles of code of nomenclature	1	OII
CO-2	able to evaluate the distribution, evolution and	2	Ev
	phylogenetic relationship among plants.	2	Ľν
CO-3	able to study the contribution of taxonomist in plant	1	Un
	systamatics and	1	UII
CO-4	outline and recall the different systems of classification	2	Pa
	of angiosperms	2	Ke
CO-5	able to acquint the skill of plant collection and	6	۸n
	herbarium preparation	0	Ар
CO-6	explain the floristic features of families in technical	2	An
	terms	2	All
CO-7	identify medicinal plants and prioritize conservation of	6	Cr
	medicinal plants	0	CI
CO-8	apply the practical knowledge of medicinal plants in	8	٨n
	their day to day life	0	Ар

Unit I	Modification of plant parts: root, stem, leaf . Morphology of Inflorescence, flower and fruits.		
Unit II	Concept of classification – Natural system- Bentham and Hooker. Vegetative , floral characters and economic importance of : Annonaceae, Rutaceae, Caesalpiniaceae.		
Unit III	Rubiaceae, Asclepiadaceae, Euphorbiaceae, Poaceae.		
Unit IV	Study of the following plants with reference to the morphology		

of the useful parts and their importance: Aloe vera, Zingiber officinale, Piper nigrum, Gymnema sylvestre.

Unit V Extraction methods and medicinal uses of *Eucalyptus*, Castor and Lemon grass oil. Conservation of medicinal plants – *in-situ* and *ex-situ* methods

Books for Reference:

- 1. John Jothi Prakash, E. 2001. Medicinal and Aromatic Plants, JPR Publications, Vallioor.
- 2. John Jothi Prakash, E., K. Venkataraman, 2001. The science of Medicinal Botany, JPR Publications, Vallioor.
- 3. Kokate C.F., A. P. Purohit & S.R. Gokhale, 2004. Pharmacognosy. Nirali Prakashan.
- 4. Pandey, B.P. 2000. Economic Botany, S. Chand & Co., New Delhi.
- 5. Shukla P. and Misra, S.P. 1997. An introduction to Taxonomy of angiosperms, Vikas Pub. House Ltd., New Delhi.
- 6. Vashista, P.C. 1985. Taxonomy of Angiosperms. S. Chand & Co., New Delhi.
- 7. Wallis, T. E. 2000. Test book of Pharmacognosy. CBS Publishers.

Practicals: 2Hrs/week

- 1. To make dissections and drawing of the floral parts of typical genus belonging to the families prescribed in the syllabus to bring out the salient features (Floral diagram and floral formula are expected).
- 2. To assign the given plant to its family giving reasons.
- 3. To identify and to record the medicinal value and morphology of the useful parts of the plant prescribed in the syllabus.
- 4. To maintain a record note book

Reference

- Gamble J.S. 1997. Flora of Presidency of madras, Volume I to III, Adlard and Son., Ltd., London
- Henry A N, Chitra V and Balakrishnan, NP, 1989. Flora of Tamil Nadu, India, Volume III. Botanical Survey of India, Southern circle Coimbatore.
- Henry AN, Kumari GR and Chitra V 1987. Flora of Tamil Nadu, India, Volume II. Botanical Survey of India.
- Mathew K M, 1981 to 1984. The flora of Tamil Nadu, Carnatic. Volume I to III. Rapinet herbarium, St. Joseph's College, Tiruchirapalli.
- Ashok Bendre and Ashok Kumar. Text Book of Practical Botany II. Rastogi Publications, Meerut.
- Shankar Gopal Joshi, 2008. Medicinal Plants. Oxford and IBH Publishing Company Pvt. Ltd. New Delhi

SEMESTER - IV			
Allied II Anatomy and Embryology			
18UBOA41	Hrs / Week: 4	Hrs / Semester: 60	Credits: 3

Vision:

• To understand the anatomy and development of embryo and reproductive organs **Mission:**

- To know the structure and functions of reproductive organs associated with seed development
- To study the internal structure of Angiosperms

CONo	Upon completion of this course, students will be able	Pos	CL
CO.NO.	to	addressed	
CO-1	trace the developmental stages associated with anther	2	An
	and pollen formation.		
CO-2	understand the rigorous journey of pollen and	2	Un
	subsequent development into male gametophyte on the		
	stigma.		
CO-3	explain the process of development of egg in the ovules.	3	An
CO-4	understand the unique biochemical events of pollen	2	Cr
	pistil interactions.		
CO-5	differentiate the embryogenesis in dicots and monocots.	2	An
CO-6	observe organization of meristem.	2	An
CO-7	recognize the cellular differentiation and locate	2	An
	historical architecture		
CO-8	develop skills in micropreparation of specimens to	6	Ар
	reveal histological organization.		-
Unit I	Anther-structure. anther wall and tapetum. Microsp	orogenesis. Po	ollen

grain structure and pollen wall. Development of male gametophyte

- Unit II Ovule-types. Structure of orthotropous ovule. Megasporogenesis Development of female gametophyte (Polygonum type). Double fertilization, and post fertilization changes.
- Unit III Endosperm-types-nuclear, cellular, helobial and ruminate (each one example). Dicot embryo-Capsella type, Monocot embryo-Luzula type.
- **Unit IV** Tissues-definition and types. Meristems -classification based on position. Shoot apex (Tunica corpus theory). Root apex (Histogen theory). Permanent tissues-simple -parenchyma, collenchyma, and sclerenchyma; Complex- xylem and phloem.

Unit V Secondary thickening in dicot stem (Polyalthia, Boerhaavia), monocot stem (Dracena) and dicot root (Azadirachta).

Text Books:

1. Pandey, B.P. 1995. Embryology of Angiosperms S. Chand and Company Ltd. Ram Nagar, New Delhi.

2 Pandey, B.P. 2005. Plant Anatomy S. Chand and Company Ltd. Ram Nagar, New Delhi.

Books for Reference:

- 1. Bhojwani SS and S.P Bhatnagar. 2007. The embryology of Angiosperms. Vikas Publishing house PVT. Ltd.,
- 2. Eames, A.J. and L.H. Mac Danniels. 1972. An Introduction to Plant Anatomy, Tata Mc Graw-Hill Publishing Company Ltd, New Delhi.
- 3. Maheswari, P. 1971. Introduction to embryology of angiosperm. Tata Mc Graw Hill publications and Co.
- 4. Singh, V., P.C. Pandey and D.K. Jain. 1987. Anatomy of Seed Plants, Rastogi Publication, Meerut.

Practical

Hr/ week: 2

- 1. Observation of tissues, parenchyma, collenchyma, chlorenchyma and sclerenchyma. Dissection of pollinium (Calotropis)
- 2. Dissection of dicot embryo (Tridax)
- 3. Sectioning T.S. of Datura anther (mature stage).
- 4. Observation of permanent slide- Anther (tetrad and pollen grain stage)
- 5. Observation of permanent slide Anatropous ovule.
- 6. Models-orthotropous, amphitropous and camphylotropous ovule.
- 7. Sectioning of dicot stem(Polyalthia, Boerhaavia), root(Azadirachta), monocot stem (Dracaena) to study the secondary growth
- 8. Submission: Record note book

Reference: Susila Mary and Kamala T. Anatomy and Embryology. Holy Cross College, Nagercoil.

	Semester III	
	NME – Plant Resource Utilization	
Code:18UBON31	Hrs/week:2	Credits: 2

Vision

• To appreciate the relevance of crop plants to the economies of people

Mission

- To know the commercial value of plants resources
- To study the morphology and uses of plants in our day today life

СО		PSO	CL
		addressed	
CO-1	acquire knowledge of useful plant parts	3	Re
CO-2	describe the botanical name, morphology and uses of	1	Un
	cereals, millets, legumes, vegetables and fruits.		
CO-3	know importance of plant and plant products	3	Ар
CO-4	discuss the different types of fruits	3	Ev
CO-5	evaluate the medicinal value of spices and condiments	3	Ev
CO-6	understand the chemical composition of plant products	5	Un
CO-7	explain the use of beverages and their production	6	Un
CO-8	prepare groundnut and eucalyptus oil	6	Cr

Unit I	:	Cereals: Rice, Wheat, Maize and Oat Millets: Pearl millet, Italian millet, Finger millet (Botanical name, Morphology and uses only)
Unit II	:	Legumes: Soyabean, black gram, green gram and Bengal gram Vegetables: Stem – Potato, garlic, Herbage – Cabbage, cauliflower, Fruit - Tomato, Brinjal (Botanical name, Morphology and uses only)
Unit III	:	Fruits: Tropical – Mango, banana, guava and papaya, Temperate – Apple and grape (Botanical name, Morphology and uses only)
Unit IV	:	Spices and Condiments: Roots – asafetida, stem – ginger, bark – cinnamon, leaf – curry leaves, flower bud –clove, fruit – capsicum, coriander and black pepper.
Unit V	:	Botanical description and production of beverages - tea and wine Oil –groundnut, coconut and Eucalyptus oil.

Books for Reference:

- 1. Chrispeels M.J. and Sandava. D. 1977. Plants, Food and People. San Fancisco.W.H. Preeman &Co.
- 2. Kocchar S L. 1998. Economic Botany of the Tropics. II Edn. Mac Millan India Ltd.
- 3. Pandey B. P. 1999. Economic Botany, S. CHAND
- 4. Sammbamurty A.V.S.S., Subrahmanyam N.S. 2008. A text book of Modern Economic Botany CBS publisher
- 5. Sharma O. P. 1996. Hills Economic Botany, Tata McGraw Hill. Co. Ltd. New Delhi
- 6. Sunidhi Miglani, 2016. Text Book of Economic Botany, ABS Books. Delhi
- 7. Swaminathan M and Kochar S. L. 1989. Plants and Society, Macmillar Publisher. Ltd.
- 8. Wickens G E 2004. Economic Botany. Principles and Practices, Springer, Kluer Publishers. Dordecht The Netherlands.

SEMESTER IV				
Non Major Elective : Food Technology				
Code:18UBON412hrs/weekCredit:2				

Vision

• To offers professional edge to the students by providing hands on training

Mission

• To familiarize the students about the food processing and preservation techniques.

Co.No.	Upon completion of this programme, students will be able to	PSOs Addressed	CL
<u> </u>		Autesseu	T.T.a
0-1	methods.	0 & 8	Un
CO-2	identify and explain nutrients in foods and the specific	6 & 8	Re
	functions in maintaining health.		
CO-3	recognize the spoilage and deterioration mechanisms in	6 & 8	An
	foods and methods to control deterioration and spoilage.		
CO-4	manufacture a range of simple food products	6 & 8	Ар
CO-5	modify recipe for specific purposes such as nutrient	4	Ар
	enhancement, quality improvement and ingredient		
	substitution.		
CO-6	understand the compositional and technological aspects of	6 & 8	Un
	milk and fish		
CO-7	bakery technology and quality aspects of bakery products	6 & 8	
CO-8	Apply preservation principles in product design	6	Ap

- **Unit I** : Technology of Vegetables: Nutritive value of vegetable, storage of vegetable, factors affecting storage life, spoilage of vegetables. Methods of preservation refrigeration, freezing, canning, drying and dehydration, and chemical preservatives. Preparation of pickles and ready to eat vegetable products
- **Unit II** : Bakery Technology: Ingredients & processes for breads, cakes, Equipments used, product quality characteristics, faults and corrective measures. Different types of icings.
- **Unit III** : Dairy Technology: Milk and dairy products; Pasteurisation, sterilization, HTST and UHT processes. Preparation of butter, ghee, ice-cream, paneer.
- **Unit IV** : Technology of Fruits: fruit composition and nutritive value of fruits. Spoilage of fruits. Preparation of jam mixed fruits jam. Fruit juices pineapple and grapes. Squash –lemon. Sauce- tomato.

Unit V : Technology of Fish: Average composition of fish; storage of raw fish; Freshness criteria and quality assessment of fish; Spoilage of fish; Methods of Preservation of fish: Canning, Freezing, Drying, Salting, smoking, curing, fermentation. Preparation of fish sauce and fish pickle.

Text Book:

Basic Food Preparation-A complete Manual. 3rd Ed. Orient Longman Pvt. Ltd.

Reference Books:

- 1. Frazier, W.C and West Holf, D.C. 1995. Food Microbiology. Tata Mc Graw Hill publishing Co Ltd., New Delhi.
- 1. Kulshrestha, S.K. 1994. Food preservation. Vikas publishing House, New Delhi.
- Swaminathan, M., 1992. Handbook of Food Science and Experimental foods. The Banglore printing and publishing Co Ltd., Banglore.
- Srivastava, R. P., 1982. Preservation of fruits and vegetable products. Bishen Singh Mahendra Pal Singh, Dehra Dun. Dubey, S.C. (2007). Basic Baking 5th Ed. Chanakya Mudrak Pvt. Ltd. 2. Raina et.al. (2003).

	Semester III	
Core Skilled	l Based– Horticulture and Plant breedi	ing
Code:18UBOS31	Hrs/week:4 Hrs/Semester : 60	Credits : 4

Vission: This course is aimed at understanding the techniques and our work shall make significant contribution to an efficient and sustainable production of food and industrial products from plants.produce quality seeds.

Mission : To promote, develop and disseminate technologies,through a seamless blend of traditional wisdom and modern scientific knowledge.

Co.No.	Upon completion of this course, students will be able to	PSOs Addressed	CL
CO-1	explain the various divisions of horticulture and importance	4	Un
CO-2	identify the most important medicinal plants based on their chemical constituents.	6	Re
CO-3	analyse and evaluate the purity of the herbal drugs.	6	An
CO-4	formulate medicinal products and apply the knowledge on proper storage and certification.	6	Re
CO-5	elaborate the cultural practices involved in cultivation of important medicinal plants.	6	Un
CO-6	equip the skill in landscaping, gardening and floriculture and enhance sense of beautification and aesthetic values.	7	Cr
CO-7	Assess the marketing opportunities of medicinal plants	6	An
CO-8	describe various selection techniques and methods that can be used in genetic improvement of self and cross pollinated crops	6	Ap

- **Unit I** : Horticulture definition, divisions and importance. Propagation of horticultural crops cuttage, layerage, graftage and budding. Seedage characteristics of good seed, and seed treatment for germination Transplanting of seedling.
- **Unit II** : Plant growing structures objectives and types green houses, hot beds, cold frames and conservatory. Establishment and cultivation of orchard. Gardening outdoor garden –types, principles, designing and garden components.
- **Unit III** : Indoor gardening. Terrarium, hanging basket and bonsai. Commercial gardening cut flowers and economic flowers. Kitchen gardening selection of site, lay out and choice of plants. Storage and preservation of fruits and vegetables.
- **Unit IV** : Plant breeding: Nature and scope of plant breeding; Defining objectives of crop improvement -high yielding variety-disease resistant crops.hybridization techniques -emasculation-bagging. crossing.labellingand harvesting of hybrid seeds and raising F1

generation. Methods of Breeding self pollinated, cross pollinated and asexually propagsted crops, pure line and mass selection.

Unit V : Development of hybrid cultivars-Evalution of combining ability, prediction of double cross hybrid performance, production of hybrid through the use of cytoplasmic-genetic male-sterility system. Breeding for pest resistance: specific resistance vs general resistance, mechanism of resistance, tolerance, use and development of resistance gene.

Books for Reference:

- 1. Choudhri D and Amal Metha 2010. Flower crops cultivation and management Oxford book company . Jaipur
- 2. Edmund Senn Andrew Halfacre. 1977. Fundamentals of Horticulture. Tata Mc. Graw Hill.
- 3. Hartmann & Kester, 1989 Plant propagation. Prentice Hall of India Pvt. Ltd. New Delhi.
- 4. Mallikarjuna Reddy and Aparna rao 2010. Plant propagation in horticulture. Pacific book international. New Delhi.
- 5. Kumar, N. 1997. Introduction to Horticulture. Rajalakshmi Publications, Nagercoil, India.
- 6. Randahawa 1985. Floriculture in India. Allied publishers.
- 7. Utpal Banerji 2008. Horticulture Mangal Deep Publication. Jaipur
- 8. Principles and practice of plant breeding J.R Sharma.TataMcGraw-Hill Publishing Company Limited New Delhi.
- 9. Principles of plant breeding R.W.AllardJohn Wiley & Sons, Inc.New York.
- 10. Plant Breeding Theory and Practice. V.L.Chopra. Oxford and IBH Publishing Co. Pvt.Ltd. New Delhi.
- 11. Evolution Jay M. Savage. Amerind Publishing Co. Pvt.Ltd.
- 12. Cytology and Evolution E.N.Willmer.Academic press New York and London.

Reference: Jean Taylor , 1973. Practical flower arranging, The Hamlyn Publishing group Ltd., NewYork