Annexure 3a

E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI -14.

(An Autonomous Institution – Affiliated to Madurai Kamaraj University)

Re-accredited (3rd Cycle) with Grade A+ & CGPA 3.51 by NAAC

CBCS

ALLIED BOTANY - UG

(For B.Sc. Zoology Major)

(w.e.f. 2021 – 2022 Batch onwards)

COURSE STRUCTURE – SEMESTER WISE

Sem.	Subject Code	Title of the paper	Teaching Hrs. (Per week)	Duration of Exam (hrs.)	Marks allotted			
					CIA	SE	Total	Credits
III	21AG3	Plant Diversity - I	4	3	25	75	100	4
IV	21AG4	Basics of Botany	4	3	25	75	100	4
	21AG4P	**Botany Practical- I** Plant Diversity – I & Basics of Botany	2	3	40	60	100	1
V	21AG5	Taxonomy of Angiosperms & Plant Pathology	4	3	25	75	100	4
VI	21AG6	Applied Botany	4	3	25	75	100	4
	21AG6P	**Botany Practical - II** Taxonomy of Angiosperms & Plant Pathology and Applied Botany	2	3	4 0	60	100	1
							Total	**18**

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III B.Sc. ZOOLOGY
ALLIED BOTANY
(w.e.f. 2021– 2022 onwards)

Title of the Paper : Taxonomy of Angiosperms & Plant Pathology

Semester	**: V**	**Contact hours**	**: 4 hrs.**
Sub Code	**: 21AG5**	**Credits**	**: 4**

Objectives:

1. To learn the morphology of flowering plants.
2. To know the economic values of plants in each family.
3. To bring awareness to the usage of economically useful plants.
4. To identify the plant diseases and the method of rectification.

Unit I: Morphology of Flowering Plants:

Plant and its parts. Structure and function of root and stem. Leaf and its parts. Leaf types- simple and compound. Phyllotaxy and Venation types. Inflorescence – Racemose (Raceme, Panicle, Spike, Corymb and Umbel), Cymose (Solitary, Monochasial, Dichasial and Polychasial) and Special types (Verticillaster and Cyathium).

Unit II: Plant Morphology

Terminology with reference to flower description. **Flower** – Parts of a typical flower, floral whorls a) **Calyx** – Types of Calyx b) **Corolla** – Forms – Cruciform, Papilionaceous, Infundibuliform and Bilabiate and Aestivation types. c) Sexuality of flower d) Merosity – Trimerous, Tetramerous and Pentamerous of flowers.

c) **Androecium** – Parts of stamen – Monadelphous, Diadelphous and Polyadelphous.

d) **Gynoecium** – Parts of carpel – Apocarpus and Syncarpous, types of placentation in ovules.

Unit III: Taxonomy of Angiosperms

Study the characters and plants of economic importance in the following families: Rutaceae, Caesalpiniaceae, Asclepiadaceae, Euphorbiaceae and Cannaceae.

Unit IV: Economic Botany

Cereals – 1. Paddy (*Oryza sativa***)** Poaceae **2. Millets – Ragi (***Eleusine coracana***)** Poaceae **3. Pulses – Cowpea (***Vigna unguiculata***)** Fabaceae **4. Fruits - Banana- (***Musa paradisiaca***)** *Musaceae* - Ripe Fruit, Inflorescence, Pseudostem **5. Nuts- Cashew Nut- (***Anacardium occidentale***)** Anacardiaceae.

Unit V: Plant Pathology

The general account of Bacterial and Viral diseases – Symptoms, Causative organisms and control measures of the following diseases: **Viral disease** – Bunchy top of Banana; **Bacterial disease** –Canker of Citrus; **Fungal disease** – Tikka disease of groundnut.

Text Books:

1. Annie Ragland. *Fundamentals of Botany*. Saras Publication, New Delhi, (2002).
2. Pandey, B.P. *A Textbook of Botany: Angiosperms - Taxonomy, Anatomy, Embryology and Economic Botany*. S. Chand Ltd. New Delhi, (2001).
3. Pandey, B. P. *Plant Pathology Pathogen and Plant Disease*. Sultan Chand & Company, New Delhi, (2018).
4. Singh, V and Jain D. K. *Taxonomy of Angiosperm*. Rastogi Publication, Meerut, (2009).
5. Singh, V. Pande, P.C. Jain, D.K. *Economic Botany*. Rastogi Publications, (2016).

Reference Books:

1. Bendre, M. Ashok and Ashok Kumar, A. Text Book of Practical Botany 1 (10th ed). Rastogi Publications, Meerut, (2020).
2. Kochhar, S. L. Economic Botany*: A Comprehensive Study*, Cambridge University Press, (2018).
3. Mehrotra, R.S. and Aggarwal. *Plant Pathology*. Tata McGraw-Hill, (2003).
4. Sambamurty, A.V.S.S. Taxonomy of Angiosperms. Wiley Publication, Dreamtech Press. (2019).
5. Singh, V, Pande P.C. Jain, D.K. *A Text Book of Botany Angiosperms.* Rastogi Publication, Meerut, (2019).

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B. Sc. ZOOLOGY
ALLIED BOTANY
(w.e.f. 2021– 2022 onwards)

Title of the Paper : Applied Botany

Semester	**: VI**	**Contact hours**	**: 4 hrs.**
Sub Code	**: 21AG6**	**Credits**	**: 4**

Objective:

1. To understand the basic concepts of plant breeding and its methods.
2. To learn plant propagation methods.
3. To know the plant tissue culture techniques and their importance
4. To acquire the therapeutic values of various medicinal plants.
5. To study the potential scopes of medicinal plants in nanotechnology.

Unit I: Plant Breeding

Objectives of plant breeding, Types, Methods of crop improvement –Mass selection, Hybridization Technique. Mutation and Polyploidy in plant breeding (Achievements only).

Unit II: Horticulture

Methods of Propagation Vegetative: – **a**) *Natural* – Rhizome, bulb, corm and sucker. **b**) *Artificial* – Stem Cutting (Herbaceous, Softwood, Semi – Hardwood and Hardwood cutting), advantages. **Layering** (Simple, Compound and Air Layering) Advantages. **Kitchen Garden** – aim, layout, choices of vegetable plants and advantages. **Greenhouse Structure** – **a**) Site selection and orientation **b**) Structure materials **c**) Covering materials **d**) Temperature and humidity control. Advantages of greenhouses in growing ornamental, vegetable, fruit, and medicinal plants.

Unit III: Tissue Culture

Tissue culture – Laboratory requirements for plant tissue culture – Media: MS medium composition and preparation, Tissue culture techniques (Steps) – Types of culture of plant materials – Shoot, meristem and anther cultures, Applications of tissue culture.

Unit IV: Medicinal Botany

Description of the individual plant, Common name, Botanical name, Family, Morphology of the useful part, Chemical constituents and Medicinal uses of the following plants:-

- Turmaric (*Manjal*) – *Curcuma longa* – Zingiberaceae
- Nelavembu – *Andrographis paniculata* – Acanthaceae
- Tulsi – *Ocimum sanctum* – Lamiaceae
- Sotrukatrallai – *Aloe vera* – Liliaceae
- Perunelli – *Phyllanthus emblica* – Euphorbiaceae

Preparation method of powder and oil from medicinal plants.

Unit V: Nanotechnology

Introduction to nanotechnology, Types of nanoparticles used in plants, Nanotechnology in Agricultural development **–** Nano-pesticides, and Nano-fertilizers. Intellectual Property Rights (IPR) – forms of protection and patenting of biological materials.

Text Book:

1. Joshi S.G. Medicinal plants. Oxford & IBH Publishing, (2018).
2. Kumaresan, V. Fundamentals of Horticulture and Plant Breeding, Saras Publication, (2015).
3. Kumaresan, V. *Techniques in Biotechnology*. Saras Publication, Nagercoil, (2014).
4. Tiwari, M.D. 2008. A modern dictionary of nanotechnology. 1st edition, Deep and Deep Publications Pvt Ltd., New Delhi.

Reference books:

1. Bojwani, S.S. *Plant Tissue Culture*: *Applications and Limitations* (HB). Elsevier Science Publisher, Netherland, (2013).
2. Goodsell, D. S. 2004. Bionanotechnology, I Ed, Wiley Liss Publications, USA.
3. Singh B.D. Plant Breeding Principles and Methods. Med Tech Science Press, (2022)
4. Singh, J. 2018. Fundamentals of Horticulture. Kalyani Publishers.
5. Soni, N.K. and Vandana Soni, *Indian Medicinal Plants*. Tata McGraw Hill Education Private Ltd. New Delhi (2010).

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ALLIED BOTANY PRACTICAL PAPER - II
(for B. Sc. Zoology Major)
(w.e.f. 2021– 2022 onwards)

Title of the Paper: Taxonomy of Angiosperms & Plant Pathology and Applied Botany

Semester	**: VI**	**Contact hours**	**: 4 hrs.**
Sub Code	**: 21AG6**	**Credits**	**: 4**

1. Dissections of the floral parts of the given plants and technically describe its salient features.
2. To identify types of Phyllotaxy and Venation types and Inflorescence (Racemose and Cyme)
3. Spotter identification of economically important plants (Paddy, Ragi, Cowpea, Banana, and Cashew Nut).
4. Spotter identification of plant disease (Bunchy top of banana, Citrus canker and Tikka Disease).
5. Study the methods of hybridization technique.
6. Study the different types of Horticulture techniques (Vegetative propagation and Layering).
7. Demonstration of Plant Tissue Culture technique.
8. Spotter identification of the medicinal plant (Turmaric, Nelavembu, Tulsi, Sotrukatrallai, Perunelli).
9. Demonstration of Nanoparticle synthesis.
10. Observation of record notebook.