UNIVERSITY OF MADRAS

M.Sc. DEGREE PROGRAMME IN BOTANY

SYLLABUS WITH EFFECT FROM 2023-2024

Title of the Course		**TAXONOMY OF ANGIOSPERMS AND ECONOMIC BOTANY**					
Paper Number		**CORE IV**					
Category	Core	**Year**	I	**Credits**	4	**Course Code**	423C2A
		Semester	II				
Instructional Hours per week		**Lecture**		**Tutorial**		**Lab Practice**	**Total**
		3		1		-	4
Pre-requisite		Prior knowledge on morphological, anatomical characteristics and uses of plants.					

Learning Objectives:

C1	To be familiar with the basic concepts and principles of plant systematics.
C2	To develop a suitable method for correct characterization and identification of plants.
C3	To understand the importance of taxonomic relationships in research of plant systematics.
C4	To provide information on various classification systems
C5	To know about the economic importance of plants.

UNIT	CONTENTS
I	**TAXONOMY AND SYSTEMATICS** Principles of classification as proposed – Natural – Bentham and Hooker, Phylogenetic system - Modern – Takhtajan. APG-IV system, Bar coding. Taxonomic keys, Botanical gardens and herbaria of world, preparation and maintenance of Herbarium, Botanical survey of India – its organization and role.
II	**MODERN TRENDS IN TAXONOMY** Modern trends in taxonomy, chemotaxonomy, numerical taxonomy, biosystemics. ICBN uninominal systems- genesis binomial nomenclature, importance and principle. Important articles, typification, principles of priority, effective and valid publication and author citation,
III	**SYSTEMATIC ANALYSIS OF PLANTS-I** Polypetalae – Sterculiaceae, Portulaceae, Rhamnaceae, Vitaceae, Sapindaceae, Combretaceae, Passifloraceae.
IV	**SYSTEMATIC ANALYSIS OF PLANTS-II** Gamopetalae – Sapotaceae, Oleaceae, Boraginaceae, Scrophulariaceae, Bignoniaceae, Verbenaceae. Monochlamydeae – Nyctaginaceae, Aristolochiaceae, Casuarinaceae. Monocots –Amarylidaceae, Commelinaceae, Cyperaceae.
V	**ECONOMIC BOTANY** General account on utilization of selected crop plants: (i) Cereals (rice) (ii) Pulses (red gram) (iii) Drug yielding plants (*Withania somnifera)* (iv) Oil yielding plants (Groundnut). (v) Sugar yielding plants (sugarcane), (vi) Spices and condiments (cardamom). (vii) Commercial crops - fibre (jute), (viii) Timber

	(Teak), (ix) Resins and gums (Asafoetida) – (x) Essential oils (lemon grass), (xi) Beverages (tea), (xii) Plants used as avenue trees for shade, pollution control and aesthetics (xiii) Energy plantation - uses of *Casuarina*.

Course outcomes: CO	**On completion of this course, the students will be able to:**	**Programme outcomes**
CO1	Understand of the basic principles of systematics, including identification, nomenclature, classification, and the inference of evolutionary patterns from data	K1, K2 K3
CO2	Validate the ability to handle and analyze plant materials in the laboratory and herbarium and in the field.	K1, K2 K5
CO3	Distinguish dicot and monocot families with specific examples and engage themselves scientifically evaluating nature and planet earth's treasures.	K1, K2 K3, K4
CO4	Demonstrate comprehension of basic concepts and the ability to use scientific terminology accurately through effective oral and written communication and the use of dichotomous keys in a regional floristic manual..	K1, K2 K3, K4
CO5	Understand and analyze about the economic importance of plants.	K1, K2 K3, K5

Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)	Questions related to the above topics, from various competitive examinations UPSC / TRB / NET / UGC – CSIR / GATE / TNPSC /others to be solved (To be discussed during the Tutorial hour)
Skills acquired from this course	Knowledge, Problem Solving, Analytical ability, Professional Competency, Professional Communication and Transferrable Skill

Recommended Text:

1. Pandey, B.P. 2013. Taxonomy of Angiosperms, S. Chand Publishing, New Delhi.
2. Sharma, O.P. 2017. Plant Taxonomy. (II Edition).The McGraw Hill Companies.
3. Singh, G. 2007. Plant systematics theory and practices. Oxford and IBH Publishing Co.
4. Jain, S.K and Rao R.R. 1993. A handbook of field and herbarium methods. Today and Tomorrow Publ.
5. Pandurangan, A.G., Vrinda, K.B and Mathew Dan. 2013. Frontiers in plant taxonomy. JNTBGRI, Thiruvananthapuram, Kerala.
6. Vardhana, R. 2009. Economic Botany. 1st ed. Sarup Book Publishers Pvt Ltd. New Delhi.
7. Subramaniam, N.S. 1997. Modern plant taxonomy. Vikas Publishing House, New Delhi.

Reference Books:

1. Bentham, G and Hooker, J.D. 1924. Handbook of the British Flora. 7th Ed. Revised by A. B. Rendle, L. Reeve & Co., London, UK.

2. Rendle, A.B. 1967. Classification of flowering plants, Cambridge University Press, Cambridge.
3. Gamble J.S. 2012. Flora of the Presidency of MadraVolI, II, III, Revised edition, Pragun Publications.
4. Hutchinson, J. 1973. The Families of Flowering Plants. 3 rd ed. Oxford University Press, UK.
5. Takhtajan, A.L. 1997. Diversity and Classification of Flowering Plants. Columbia University Press, New York.
6. Woodland, D.W. 1991. Contemporary Plant Systematics. Prentice Hall. New Jersey.
7. Mabberley, J.D. 2014. Mebberley's Plant-Book: A portable dictionary of plants, their classification and uses, 3rd ed. Cambridge University Press, Cambridge, U.K. 1021pp
8. Cronquist, A. 1988. The Evolution and Classification of Flowering Plants. 2nd ed. New York Botanical Garden, NY, USA.
9. Davis, P.H and Heywood, V.H. 1972. Principles of Angiosperm taxonomy. Edinburgh, London, Publ.
10. Henry, A.N and Chandrabose, M. 1979. An aid to the International Code of Botanical Nomenclature. Today and Tomorrow Publ.
11. Simpson, M.G. 2010. Plant Systematics. Elsevier Academic Press, California.
12. Hill.A.W. 1981. Economic Botany. McGraw Hill Pub. Inc., New York.
13. Street, H.E. 1978. Essay in Plant Taxonomy, Academic Press, London, UK.
14. Thompson, H.C.1949. Vegetable Crops. 4th ed. McGraw-Hill Book Co.,Inc.,New York.
15. Wallis, T.E. 1946. Text book of Pharmacognosy. J. & A. Churchill Ltd, London.
16. Michael,G.Simpson.2019.Plant Systematics-3rd ed., Academic Press, New York, USA.
17. Sokal, S.R and P.H.Sneath. 1973. Principles of numerical taxonomy.N.H.Freemen&Co.
18. Henry, A.N and Chandra Bose. 1982. An aid to the International code of Botanical nomenclature. BSI, Calcutta..

Web resources:

1.https://www.ipni.org/
2.http://www.theplantlist.org/
3.https://www.amazon.in/PLANT-TAXONOMY-Sharma/dp/0070141592
5.https://www.tropicos.org/home
6.http://apps.kew.org/herbcat/gotoHerbariumGrowthPage.do
7.https://www.absbooksindia.com/shop/science/botany/textbook-of-economic-botany

Mapping with Programme Outcomes:

COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	2	3	3	2	2	1	2	2
CO3	3	3	2	3	1	3	2	3	3	1
CO4	3	2	3	3	2	3	3	1	3	3
CO5	3	3	2	2	1	2	1	3	2	1

S-Strong (3) M-Medium (2) L-Low(1)