UNIVERSITY OF MADRAS

B.Sc. DEGREE PROGRAMME IN PLANT BIOLOGY
AND PLANT BIOTECHNOLOGY
SYLLABUS WITH EFFECT FROM 2023-2024

SKILL ENHANCEMENT COURSES (SEC 8) –TRAINING FOR COMPETITIVE EXAMINATIONS.

<table>
<tr><td>Title of the Course</td><td colspan="7">BOTANY FOR COMPETITIVE EXAMINATIONS</td></tr>
<tr><td>Paper Number</td><td colspan="7">Skill Enhancement</td></tr>
<tr><td rowspan="2">Category</td><td rowspan="2">Elective</td><td>Year</td><td>III</td><td rowspan="2">Credits</td><td rowspan="2">2</td><td rowspan="2">Course Code</td><td rowspan="2">339S6A</td></tr>
<tr><td>Semester</td><td>VI</td></tr>
<tr><td colspan="2" rowspan="2">Instructional Hours per week</td><td colspan="2">Lecture</td><td colspan="2">Tutorial</td><td>Lab Practice</td><td>Total</td></tr>
<tr><td colspan="2">2</td><td colspan="2">-</td><td>-</td><td>2</td></tr>
<tr><td colspan="2">Pre-requisite</td><td colspan="6">To develop the students for preparing various competitive examination.</td></tr>
<tr><td colspan="8">Learning Objectives</td></tr>
<tr><td>C1</td><td colspan="7">To develop the student for competitive examination.</td></tr>
<tr><td>C2</td><td colspan="7">To select the important topics as far as possible, with reference to the examination point of view. It gives a comprehensive account of botany.</td></tr>
<tr><td>C3</td><td colspan="7">To understand not only the basics of botany and also gives the broader perspective to prepare for the competitive examinations.</td></tr>
<tr><td>C4</td><td colspan="7">The essays give a detailed account of each aspect of botany to help students preparing for IAS, IFS and state civil services.</td></tr>
<tr><td>C5</td><td colspan="7">General understanding of plants around us, the different biophysical and biochemical processes that occur within them and their importance to human life.</td></tr>
<tr><td>Course outcomes:

On completion of this course, the students will be able to:
CO</td><td colspan="7">Programme Outcomes</td></tr>
<tr><td>1. Identify and define different groups of plants with their taxonomic</td><td colspan="7">K1, K2
& K5</td></tr>
</table>

position Compare the different groups of plants and evaluate their economic importance	
2.List down the general characters of Bryophytes, Pteridophytes and Gymnosperms Classify the types of fossils and recognize the fossil beds of Tamil Nadu Analyse and trace the origin of different plant groups using Geological Time scale	K1,K3 & K5
3.Appreciates the morphology of plant and analyse different modifications of plant organs. Explore the major Herbaria of the world and recognize the importance.	K3 & K5
4.Differentiate Prokaryotic and Eukaryotic cell. Evaluate the significance of cell division. Justify the cause	K2, K3 & K5

for the sex linked inheritance. Tabulate the different cell organelles with their functions.	
5. Define and appreciates biodiversity. Identify the cause and solve environmental related issues . Design eco friendly approaches to protect earth and generate new conservation strategies.	K1, K5 & K6
	GENERAL STUDIES FOR COMPETITIVE EXAMINATIONS (2 hours) Physical Geography Indian and World Geography Indian and World History International Organizations Everyday Science Awards and Honors Indian Economy Indian Polity

UNIT	CONTENTS
I	**PLANT WORLD:** Plant science and its branches . Five kingdom classification. Outline of Kingdom plantae General characters and Economic importance of Algae, Fungi and Lichens.
II	**GENERAL CHARACTERS OF PLANT GROUPS:** General characters and Economic importance of Bryophytes, Pteridophytes and Gymnosperms .Palaeobotany- Types of fossils, Geological time scale ,Fossil beds of Tamil Nadu.
	PLANT MORPHOLOGY AND TAXONOMY: Root system and shoot system. Modifications (Pneumatophore, Stilt root,

III	Epiphytic root, Cladode, Phylloclade ,Pitcher and Phyllode) Parts of a flower - Fruits types(Outline) Parthenocarpy- Pollination – types, Seed dispersal – types, Seed Germination types. Taxonomy –definition. Types of classification- Taxonomic hierarchy, ICN, Binomial nomenclature and BSI. Herbarium and Major Herbaria of the world.
IV	**CYTOLOGY AND GENETICS:** Cell –Prokaryotic and Eukaryotic – Cell organelles with functions . DNA and RNA (Basic concepts) -Cell division and its significance -Mitosis and Meiosis (outline) Mendelism – Monohybrid and Dihybrid cross, Sex linked inheritance
V	**ECOLOGY AND BIODIVERSITY:** Ecosystem – abiotic and biotic components. Energy flow in an ecosystem, Aforestation, Deforestation- Chipko movement –-Forest Conservation act- Pollution types and effects- Eutrophication, Global warming ,Ozone depletion, Climate change. Biodiversity and types- Hot spots, Mega diversity countries, Conservation – *ex situ* and *in situ* methods. Endangered plants and Red data Book. Rio -Earth summit. Biodiversity Management Policies - IUCN, UNEP, WWF, ICSU, WCMC.
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 Texts	1. Pullaiah, T & D, Varalakshmi Narayana, P, Suresh. 2021. Botany for Competitive Examinations: (Useful for UPSC-Indian Forest

	Service, Civil Services, PCS, ASRB CSIR - NET, ICAR-NET and Other Competitive Exams.) Astral Cracker. 2. Mitra, S. 2016. Botany for competitive examinations, Academi Publishers. 3. Mohd Akil Shahezad. 2018. M.C.Qs. in Botany, Library Book House. 4.Sharma, P.C. 2017. Text Book of Plant Anatomy. Arjun Publishing House, New Delhi. 5. Sharma, O.P. 2017. Plant Taxonomy. (II Edition).The McGraw Hill Companies Taxonomy: Nair Datta 6. Thieman. 2014. Introduction to Biotechnology 3rd Edition. Pearson Education India.
Reference Books	1. De Robertis and De Robertis. 1990. Cell and Molecular Biology, Saunders College, Philadelphia, USA. 2. Gardner, E.J., Simmons, M.J and Snustad, D. 1991. Principles of Genetics, John Wiley Sons Inc., 8th Edn., New York. 3. Salisbury, F. B.C.W. Ross.1991. Plant Physiology. Wassworth Pub. Co. Belmont. 4. Sharma, P.D. 2017. Ecology and Environment- Rastogi Publication, Meerut. 5. Vardhana, R. 2009. Economic Botany. 1st ed. Sarup Book Publishers Pvt Ltd. New Delhi. 6. Power, C.B and Daginawa, H.F. 2010. General Microbiology : Himalaya Publishing House Pvt Ltd, 7. Rangasamy, G. 2006. Disease of crop plants in India (4th edition). Tata Mc Graw Hill New Delhi. 8. Singh, V., Pande, P.C and Jain, D.K. 2021. A Text Book of Botany. Rastogi Publications,Meerut. 9. Bhojwani, S.S. Bhatnagar, S.P and Dantu, P.K. 2015. The Embryology of Angiosperms (6th revised and enlarged edition). Vikas Publishing House, New Delhi.
Web resources	1. https://www.amazon.in/BOTANY-COMPETITIVE-EXAMINATIONS-SUNIT-MITRA/dp/9383420898 2. https://www.amazon.in/Botany-Competitive-Examinations-UPSC-Indian-Competive/dp/B08VWB64BC 3. https://www.ssclatestnews.com/botany-book-pdf-free-download-for-competitive-exams/ 4. https://sscstudy.com/botany-for-competitive-exams-pdf/ 5. https://www.amazon.in/Botany-Entrance-Examination-Anupam-Rajak-ebook/dp/B089S1GLMP

Mapping with Programme Outcomes:

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COs	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	1	3	2	1	1	2	3	1
CO 2	3	2	1	2	3	3	2	3	2	1
CO 3	2	2	3	3	1	2	1	3	2	3
CO 4	3	3	3	3	3	2	3	3	3	3
CO 5	3	3	2	3	2	1	3	3	3	2

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