UNIVERSITY OF MADRAS

M.Sc. DEGREE PROGRAMME IN BOTANY

SYLLABUS WITH EFFECT FROM 2023-2024

Title of the Course		**ECOLOGY, PHYTOGEOGRAPHY, CONSERVATION BIOLOGY AND INTELLECTUAL PROPERTY RIGHTS**					
Paper Number		**CORE VI**					
Category	Core	**Year**	I	**Credits**	4	**Course Code**	423C2C
		Semester	II				
Instructional Hours per week		**Lecture**	**Tutorial**	**Lab Practice**	**Total**		
		3	1	-	4		
Pre-requisite		Understanding the environmental factors impacting biodiversity is crucial after taking this course and Basic understanding of how laws are structured and interpreted.					

Learning Objectives:	
C1	To analyze and comprehend the fundamental ideas of plant ecology as a scientific study of environment.
C2	To study the plant communities and plant succession stages.
C3	To be aware of the causes, impacts and control measures of pollution.
C4	To study biodiversity management and conservation.
C5	To enhance the knowledge of the students and equip them in evaluate and protecting invaluable components of nature and interactions with the environment.
UNIT	**CONTENTS**
I	**ECOLOGICAL PRINCIPLES:** Introduction – History, scope, concepts. Diversity of plant life; growth form, life form. Basic concepts of population ecology– population dynamics – Regulation of population density. Basics concepts of community – characteristics, composition.
II	**ECOSYSTEM ECOLOGY AND RESOURCE ECOLOGY:** Introduction – kinds – major types – functional aspects of ecosystem: Food chain and food web, energy flow in an ecosystem. Productivity – primary and secondary productivity – GPP and BPP. **Resource Ecology:** Energy resources; renewable and non-renewable. **Environment Deterioration:** Climate change - Greenhouse effect and global warming, ozone depletion and acid rain. Waste management - Solid and e-waste, recycling of wastes. Eco-restoration/ - carbon foot print - environmental auditing.
III	**PHYTOGEOGRAPHY:** Phytogeographical Zones - Vegetation types of India and Tamil Nadu, Distribution: Continuous, Discontinuous and Endemism. Continental drift, Age and area hypothesis. Geographical Information System (GIS). Principles of remote sensing and its applications.
IV	**BIODIVERSITY AND CONSERVATION ECOLOGY:** Definition, types of biodiversity – values of biodiversity – Hot spots – Threats to biodiversity: habitat loss. Endangered and endemic plant species of India. Red list categories of IUCN. Biotechnology assisted plant conservation- *in situ* and *ex situ* methods.

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V	**INTELLECTUAL PROPERTY RIGHTS:** Intellectual Property Rights – Introduction, Kinds of Intellectual Property Rights- Patents, Trademarks, Copyrights, Trade Secrets. International Regime Relating to IPR – TRIPS, WIPO, WTO, GATTS.	
Course outcomes: CO	**On completion of this course, the students will be able to:**	**Programme outcomes**
CO1	Understand the scope and importance of population ecology, plant communities and ecosystem ecology.	K1 & K2
CO2	Understand the applied aspect of environmental botany.	K1 & K4
CO3	Students will spot the sources and pollution and seek remedies to mitigate and rectify them.	K2
CO4	Identify different plant communities, categorize plant biomes and identify threatened, endangered plant species and create awareness program in protection of biodiversity.	K3
CO5	Analyze insight into the vegetation types, species interaction and their importance and the factors influencing the environmental conditions.	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. Sharma, P.D. 2017. Ecology and Environment- Rastogi Publication, Meerut.
2. Pushpa Dahiya and Manisha Ahlawat. 2013. Environmental Science- A New Approach, Narosa Pub. House, New Delhi.pp.2.1-2.60.
3. Eugene Odum, 2017. Fundamentals of Ecology 5th Ed. Cengage, Bengaluru.
4. Sharma P.D. 2019. Plant ecology and phytogeography, Rastogi Publications, Meerut.
5. Neeraj Nachiketa. 2018 Environmental & Ecology A Dynamic approach. 2nd Edition GKP Access Publishing.
6. Chandra, A.M and Ghosh, S.K. 2010. Remote sensing and Geographical Information System, Narosa Publishing House Pvt. Ltd. New Delhi.

Reference Books:

1. Keddy, P.A. 2017. Plant Ecology: Origins, processes, consequences. 2nd ed. Cambridge
2. University Press. ISBN. 978-1107114234.
3. Krishnamurthy, K.V. 2004. An Advanced Text Book of Biodiversity- Principles and
4. Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi.
5. Ahuja, V.K. 2017. Law relating to Intellectual Property Rights. India, IN: Lexis Nexis.
6. Nithyananda, K.V. 2019. Intellectual Property Rights: Protection and Management. India,

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IN: Cengage Learning India Private Limited.
7. Venkataraman M. 2015. An introduction to Intellectual property rights. Create space Independent Pub.North Charleston, USA.
8. Kormondy, E.J. 2017. Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
9. Gillson, L. 2015. Biodiversity Conservation and Environmental Change, Oxford University Press, Oxford.

Web resources:

1. https://www.intechopen.com/chapters/56171
2. https://plato.stanford.edu/entries/biodiversity/
3. https://sciencing.com/four-types-biodiversity-8714.html.
4. https://www.iaea.org/topics/plant-biodiversity-and-genetic-resources
5. http://www.bsienvis.nic.in/Database/Status_of_Plant_Diversity_in_India_17566.aspx
6. https://www.youtube.com/watch?v=qtTLiQoYTyQ
7. https://www.youtube.com/watch?v=208B6BtX0Ps
8. https://www.youtube.com/watch?v=6p1TpVJYTds
9. https://www.amazon.in/Intellectual-Property-Rights-Vijay-Durafe-ebook/dp/B08N4VRQ86

Mapping with Programme Outcomes:

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

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

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