

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

CORE-V PLANT DIVERSITY III BRYOPHYTES AND PTERIDOPHYTES

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| Title of the Course | PLANT DIVERSITY-III BRYOPHYTES AND PTERIDOPHYTES | | | | | | |
| Paper Number | CORE V | | | | | | |
| Category | Core | Year | II | Credits | 5 | Course Code | 239C3A |
| | | Semester | III | | | | |
| Instructional Hours per week | | Lecture | Tutorial | Lab Practice | Total | | |
| | | 4 | 1 | - | 5 | | |
| Pre-requisite | | Students should be familiar with the basics of Bryophytes and Pteridophytes. | | | | | |
| Learning Objectives | | | | | | | |
| C1 | To enable the students to have an overview of Non-vascular and Vascular cryptogams. | | | | | | |
| C2 | To understand the morphological diversity of Bryophytes and Pteridophytes. | | | | | | |
| C3 | To know the evolution of Bryophytes and Pteridophytes. | | | | | | |
| C4 | To understand the economic importance of the Bryophytes and Pteridophytes. | | | | | | |
| C5 | To understand anatomy and reproduction of Bryophytes and Pteridophytes. | | | | | | |
| Course outcomes: On completion of this course, the students will be able to: CO | Programme Outcomes | | | | | | |
| 1 Recognize morphological variations of Bryophytes and Pteridophytes. | K1 | | | | | | |
| 2. Explain the anatomy and reproduction of Bryophytes and | K2 | | | | | | |

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| Pteridophytes. | |
| 3. Compare and contrast the variations in the internal cellular organization, gametophyte and sporophyte of Bryophytes and Pteridophytes. | K3 |
| 4. Decipher the stages of plant evolution and their transition to land habitat. | K4 |
| 5. Access the useful role of Bryophytes and Pteridophytes. | K5 |
| UNIT | EXPERIMENTS |
| I | BRYOPHYTES General characters of Bryophytes, classification (Watson, 1971) (upto family). Economic importance of Bryophytes – Ecological importance (Pollution indicators and monitoring), Medicinal uses, horticulture, industrial uses and absorbent bandages. |
| II | Structure, reproduction and life histories of the following classes each with an example: Hepaticopsida (<i>Marchantia</i>); Anthocerotopsida (<i>Anthoceros</i>) and Bryopsida (<i>Polytrichum</i>). (Developmental studies not needed). Evolution of Bryophytes |
| III | PTERIDOPHYTES General Characters of Pteridophytes - Classification (Reimer, 1954) (upto Family). Apogamy and apospory, homospory and heterospory. |
| IV | Morphology, anatomy and reproduction of the taxa belonging to each of the following classes: Psilotopsida (<i>Psilotum</i>), Lycopsidea (<i>Lycopodium</i>), Sphenopsida (<i>Equisetum</i>), Pteropsida (<i>Marsilea</i>). |
| V | Origin and evolution of Pteridophytes. Stelar Evolution. Economic importance of Pteridophytes. |
| Extended Professional Component | Questions related to the above topics, from various competitive examinations UPSC / TRB / NET / UGC – CSIR / GATE / TNPSC /others to be solved |

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| (is a part of internal component only, Not to be included in the External Examination question paper) | (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 | <ol style="list-style-type: none"> 1. Sharma, O.P. 2017. Bryophyta, MacMillan India Ltd. Delhi. 2. Alam, A. 2020. Contemporary Research on Bryophytes Book Series: Recent Advances in Botanical Science. 10.2174/97898114337881200101. 3. Alain Vanderpoorten. 2009. Introduction to Bryophytes, 1st Edition, Cambridge University Press. 4. Chopra, R. N. 2005. Biology of bryophytes. New Age International (P) Ltd. New Delhi, India. 5. Prem Puri. 2001. Bryophytes– morphology growth and differentiation. Atma Ram & Sons. Lucknow, India. |
| Reference Books | <ol style="list-style-type: none"> 1. Eames, A. 1963. Morphology of lower vascular plant, McGraw Hill, Chennai. 2. Parihar. N.S. 1967. An introduction of Embryophyta, Vol.III – Pteridophyta, Central book depot, Allahabad. 3. Smith, G.M. 1955. Cryptogamic Botany, Volume-II– McGraw Hill, Chennai 4. Sporne, K.L. 1976. Morphology of Pteridophytes, 4th edition, B.I. Publication. Chennai. 5. Watson, E.V. 1963. The structure and Life of Bryophytes. Hutchinson & Co, UK. 6. Parihar, N.S. 1991. Bryophytes. Central Book Depot, Allahabad. 7. Parihar, N.S. 1996. The Biology and Morphology of Pteridophytes. Central Book Depot, Allahabad. |
| Web Resources: | <ol style="list-style-type: none"> 1. http://www.bryoecol.mtu.edu/ 2. https://www.amazon.in/Introduction-Bryophytes-Alain-Vanderpoorten-ebook/dp/B007NFWQK 3. http://scitec.uwichill.edu.bb/bcs/bl14apl/bryo1.htm |

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| | 4. http://www.bsienviis.nic.in/Database/Pteridophytes-in-India_23432.aspx 5. http://www.botany.ubc.ca/bryophyte/mossintro.html 6. aeTIUC&redir_esc=y |
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Mapping with Programme Outcomes:

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

S-Strong (3)

M-Medium (2)

L-Low(1)