Code	Subject Title	Cr. Hrs	Semester
BOT-305	Evolutionary Trends in Trachaeophytes	3	V

Year	Discipline
3	Botany

Syllabus Outline: Evolution; Modern Concepts and its Implications, Structural Organization of Early Vascular Land Plants, Microphyllophyta, Sphenophyta and Filicophyta, Gymnospersms and Angiospersms; their Evolutionay Importance, Origin and Diversification of Angiospersms.

Course Outline:

Evolution: Definition, Modern Trends, Concepts of Primitive and Advanced Characters

Trachaeophytes: Definition; Transition to Land and Modifications; Origin and Alternation of Generations According to Homologous and Antithetic Theories.

The Structure and Organization of Land Plants: Organization of the Primary Plant Body, leaf Morphology and Anatomy, Primary Development, Secondary Development, Structure of Primary Xylem and Phloem, Stele Types, Xylem Maturation Patterns,

Early Vascular Land Plants: General Characters and Evolutionary Implications in Rhyniophyta, Importance of Rhynie Chert Plants; Cooksonoids and their Importance; Zosterophyllophyta, Trimerophytophyta, Psilophyta (Psilopsida).

Microphyllophyta (Lycopsida): General Characters, Classification and Evolutionary Implications, Spores Morphology and Diversity.

Arthrophyta (Sphenopsida): General Characters, Classification and Evolutionary Implications.

Pteridophyta: General Characters, Classification and Evolutionary Implications in Eusporangiate and Leptosporangiate Ferns, Origin and Development of Seed Habit.

Gymnosperms: General Characters, Organography, Classification and Evolutionary Implications.

Angiosperms: General Characters, Organography, Evolutionary Importance, Origin of Angiosperms.

Module Aims: The course is designed to provide an adequate knowledge of Trachaeophytes and their Evolutionary Importance with special emphasis on Vegetative and Reproductive Biology including morphology of Lower Vascular Land Plants.

Learning Strategies:

1. Lectures
2. Group Discussion
3. Laboratory work
4. Seminar/ Workshop

Learning Outcome: After studying this course students will develop better understanding of the Concept of Evolution and Modern Evolutionary Trends. Students will be expected to know about the Evolutionary Architecture of Early Vascular Land Plants, Lycophytes, Sphenophytes and Ferns. General Characteristics of

Gymnosperms and Angiosperms would be taken in to account for their evolutionary implication with respect to their origin.

Assessment Strategies:

1. Lecture Based Examination (Objective and Subjective)
2. Assignments
3. Class discussion
4. Quiz
5. Tests

Books Recommended:

1. **Kramer, K.U., Green, P.S. and Götz, E. (2010).** *Pteridophytes and Gymnosperms (The Families and Genera of Vascular Plants).* (1st Ed.). Springer Link. 410pp**. ISBN-13: 978-3642080807.**

2. **Ward, L.F. (2010).** *Sketch of Paleobotany.* Nabu Press, 128pp. **ISBN-13: 978-1176480469.**

3. **Berry, E.W. (2009).** *Paleobotany; A Sketch of the Origin and Evolution of Floras.* General Books LLC. 90pp. **ISBN-13: 978-1151323286.**

4. **Ranker, T.A. and Haufler, C.H. (2008).** *Biology and Evolution of Ferns and Lycophytes.* Cambridge University Press. 500 pp. **ISBN-13: 978-0521874113.**

5. **Taylor, T.N., Taylor, E.N. and Krings, M. (2008).** *Paleobotany: The Biology and Evolution of Fossil Plants.* (2nd Ed.), Academic Press.1252 pp. **ISBN-13: 978-0123739728.**

6. **Arnold, C.A. (2007).** *An Introduction to Paleobotany.* Miller Press. 432 pp. ISBN-13: 978-1443723046.

7. **Burek, C.V. and Wilding, R. (2005).** *History of Palaeobotany: Selected Essays (Geological Society Special Publication).* (1st Ed.), Geological Society of London, 304pp.**ISBN-13: 978-1862391741.**

8. **Sambamurty, A.V.S.S. (2005).** *A Textbook of Bryophytes, Pteridophytes, Gymnosperms and Paleobotany.* I.K. International Pvt. Ltd. 584 pp**. ISBN-13: 978-8188237456.**

9. **Kenrick, P. and Davies, P. (2004).** *Fossil Plants (Smithsonian's Living Past).* Smithsonian Books. 232pp. **ISBN-13: 978-1588341563.**

10. **Willis**, **K.J. and McElwain, J.C. (2002).** *The Evolution of Plants.* Oxford University Press. 392 pp. **ISBN-13: 978-0198500650.**

11. **Bell, P.R. and Hemsley, A.R. (2000).** *Green Plants: Their Origin and Diversity.* (2nd Ed.), Cambridge University Press. 360pp. **ISBN-13: 978-0521646734.**