Master of Science (Botany)
M. Sc Botany Semester I

Course Code	PS01CBOT52	Title of the Course	Biology and Diversity of seed plants
Total Credits of the Course	04	Hours per Week	04

Course Objectives:	1. To impart knowledge on the origin and evolution of seed plants, their advantages over non-seed bearing plants. 2. To provide a detail information on the diversity in vegetative and reproductive organs of different groups of gymnosperms. 3. To demonstrate the geological distribution, economic and ecological significance of gymnosperms. 4. To demonstrate various theories on the origin of angiosperms. 5. To impart knowledge on evolution of flower and diversity in floral structures.

Course Content		
Unit	Description	Weightage* (%)
1.	Characteristics of seed plants; evolution of the seed habit; seed plants with (angiosperms) and without (gymnosperms) fruits; fossil and living seed plants. General features of gymnosperms and their classification; evolution and diversity of gymnosperms and their distribution in India.	25
2.	Geological time scale, fossilization and fossil gymnosperms: pteridospermales . Morphology of vegetative and reproductive parts; anatomy of root, stem and leaf; reproduction and life cycle of Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetales.	25
3.	Origin and evolution of Angiosperms; primitive and fossil angiosperms; advance features of angiosperms. Morphological and anatomical diversity of vegetative parts of angiosperms.	25
4.	Origin and evolution of flower. Diversity in floral morphology; evolution of inflorescence patterns. Origin and evolution of ploypetaly, sympetaly, apetaly, monoecy, dioecy; co-evolution of flower vis-à-vis pollinators. Origin and evolution of stames and carperls.	25

Teaching-Learning Methodology	Topics of the course will be taught using regular teaching tools and making the classroom lectures interactive. Students will be motivated and insisted to observe and record the diversity of plants, related to the course, from their residential surroundings, University premises and nearby wild habitats. Practical sessions will be conducted in the field, botanical garden and in the laboratory depending on the nature of the topic. Course materials will be provided from primary and secondary sources of information.

Evaluation Pattern		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Written / Practical Examination (As per CBCS R.6.8.3)	15%
2.	Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)	15%
3.	University Examination	70%

Course Outcomes: Having completed this course, students will be able to	
1.	Appreciate the advancement in life cycles of seed plants over the lower plants.
2	Recognize and identify the diversity and differences among various families of gymnosperms and angiosperms.
3.	Demonstrate the linkages of floral diversity with pollinators.
4.	They will have the knowledge of evolutionary trend in seed plants

Suggested References:	
1	Arnold C. A. 1972. An Introduction to Palaeobotany.
2	Bhatnagar,S.P. and Moitra, A. 1996. Gymnosperms. New Age International Pvt.Ltd. New Delhi.
3	Chamberlein C. J. 1966. Gymnosperms – Structure and Evolution.
4	Cutter E. G. 1971. Plant Anatomy.
5	Coulter and Chamberlein J. M. 1978. Morphology of Gymnosperms.

6	Eames A J (1961). Morphology of Angiosperms, McGraw Hill Book Co.
7	Esau K. 1962. Plant Anatomy – Anatomy of Seed Plants.
38.	Fahan A. 1969. Plant Anatomy.
9	Foster A. S. and Gifford E. M. 1959. Comparative Morphology of Vascular Plants.
10	Metcalfe C. R. and L. Chalk. 1950. Anatomy of the Dicotyledons
11	Shukla A. C. and Mishra S. D. 1975. Essentials of Palaeobotany
12	Sporne, K. R. 1967.The Morphology of gymnosperms. B. I. Publishing Pvt. Ltd., Bombay.
13.	Sporne K R (1974). Morphology of Angiosperms, Hutchinson University Library, London.
14	Subrahmanyam K. Aquatic angiosperms. BSI. India
15	Vashistha P. C. 1976. Gymnosperms.
16	Stewart, W. N. and Rathwell, G. W. 2005Paleobotany and the Evolution of Plants. 2nd edn, Cambridge University Press.

On-line resources to be used if available as reference material
On-line Resources
Relevant review articles/research papers/handouts of latest development in the subject