

Course Code	Course Name	Credits
26BY609	PLANT REPRODUCTIVE BIOLOGY	04

Course Objectives

- To provide comprehensive knowledge of reproductive biology in bryophytes, pteridophytes, gymnosperms and angiosperms with emphasis on structural and functional diversity.
- To develop an understanding of the processes of gametophyte development, pollination, fertilization, sporophyte formation and seed/endosperm development in plants.
- To familiarize students with evolutionary trends in plant reproduction from lower to higher plant groups.
- To enhance analytical and practical skills for studying reproductive structures, developmental and stages in plant life cycles.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

- Describe the reproductive structures and life cycle patterns of bryophytes, pteridophytes, gymnosperms and angiosperms.
- Explain the developmental processes of spores, gametophytes, pollination, fertilization, embryo sac and endosperm formation in different plant groups.
- Compare reproductive strategies and evolutionary advancements among major plant taxa.
Apply theoretical knowledge and observational skills in identifying reproductive organs and interpreting their biological significance.

Unit 1 - Reproductive Biology of Bryophytes (12 Hrs.)

Asexual reproduction, Sexual reproduction, Frequency and failure of sporophyte production, Sporophyte development, Spore production, dispersal and their viability.

Unit 2 - Reproductive Biology of Pteridophytes (12 Hrs.)

Synangia, Cone or strobilus, Development of the sporangium, Sorus, Classification of sori, Gametophyte generation, Antheridia and archegonia, Fertilization.

Unit 3 - Reproductive Biology of Gymnosperms (12 Hrs.)

Male Cones, Microsporangia, Development of male gametophyte, Female cones, Megasporogenesis, Development of female gametophytes, Pollination, Fertilization.

Unit 4 - Reproductive Structures and Gametophyte Development in Angiosperms (12 Hrs.)

Whorl of a complete flower, Microsporangium, Development of male gametophyte, Pollen wall, Pollenkit, Megasporangium, Types of ovules, Reduced ovules, Development of female gametophyte, Mature embryo sac, Types of embryo sacs, Haustorial behaviour of embryo sac, Nutrition of embryo sac.

Unit 5 - Pollination and Post-Pollination Events in Angiosperms (12 Hrs.)

Anther dehiscence, Pollen transfer, Cross-pollination, Artificial pollination, Fertilization, Barriers to fertilization, Development of endosperm, Types of endosperm.

Reference Books:

1. Johri, B. M., & Srivastava, P. S. (Eds.). (2001). Reproductive biology of plants (1st ed.). Springer.
2. Bhatnagar, S. P., Dantu, P. K., & Bhojwani, S. S. (2015). The embryology of angiosperms (6th ed.). Vikas Publishing House Pvt. Ltd.
3. Bhojwani, S. S., & Bhatnagar, S. P. (1999). The embryology of angiosperms (4th ed.). Vikas Publishing House Pvt. Ltd.