Swami Shraddhanand College (University of Delhi)
Alipur, Delhi- 1100036 www.ss.du.ac.in

Name of Teacher	**Dr. Renu Garg**	Department	Botany
Course	B.Sc. (H) BOTANY Sem VTH CBCS	Semester	Vth
Paper	Reproductive Biology	Academic Year	2023-2024

Learning Objectives

- To have knowledge of the flowering and fruiting, reproduction process, role of pollinators, ovule and seed development.

Learning Outcomes

- Upon completion of the course, students should be able to understand:
- Induction of flowering and molecular and genetic aspects of flower development.
- Pollen development, dispersal and pollination
- Ovule development and fertilization,
- Endosperm development and its importance
- Alternation pathways of reproduction
- Student would be able to apply this knowledge for conservation of pollinators and fruit development

Week No./ Date	**Theme/ Curriculum**
1. 16th August-31st August	Unit-2 Anther- Anther wall: Structure and functions, microsporogenesis, callose deposition and its significance. Unit- 3 Pollen biology - Micro-gametogenesis; Pollen wall structure, MGU (male germ unit) structure, NPC system (no details but table to be included); Palynology and scope (a brief account). Pol len wall proteins; Pollen viability, storage and germination; Unique features: Pseudomonads, polyads, massulae, pollinia.
2. 1st Sep-30th Sep	Unit- 4 Ovule - Structure; Types; Special structures–endothelium, obturator, aril, caruncle and hypostase; Female gametophyte– megasporogenesis (monosporic, bisporic and tetrasporic) and megagametogenesis (details of Polygonum type); Organization and ultrastructure of mature embryo sac; Female germ Unit. Unit- 5 Pollination and fertilization, Pollination types and significance; adaptations; structure of stigma and style; path of pollen tube in pistil; structure of pollen tube; double fertilization. Unit 6 Self incompatibility, Basic concepts (interspecific, heteromorphic, GSI and SSI); Methods to overcome self- incompatibility: mixed pollination, bud pollination, stub pollination; Intra-ovarian and in vitro pollination; Modification of stigma surface, para-sexual hybridization; Cybrids (in brief with examples) , in vitro fertilization. Unit -7 Endosperm Types (2 examples each), development, structure and functions.
3. 1st Oct-31st Oct	Unit 8 Embryo: Six types of Embryogeny (no details) ; General pattern of development of dicot and monocot embryo; Suspensor: structure and functions; Embryo-endosperm relationship; Nutrition of embryo; Unusual features; Embryo development in Paeonia. Unit 9 Seed Structure, importance and dispersal mechanisms (Adaptations – Autochory, Anemochory, Hydrochory, Zoochory with 2 examples each). Units 10 Polyembryony and apomixes: Introduction; Classification (given by Bhojwani and Bhatnagar); Causes and applications.
4. 1st Nov- 6th Dec	Unit 1 Introduction: History (contributions of G.B. Amici, W. Hofmeister, E. Strasburger, S.G. Nawaschin, P. Maheshwari, B.M. Johri, W.A. Jensen, J. Heslop-Harrison) and scope of Reproductive Biology. Unit 11 Germ-line transformation: Pollen grain and ovules through pollen tube pathway method

Suggested Readings	
Books	1. Bhojwani, S.S., Bhatnagar, S.P. (2011). The Embryology of Angiosperms, 5th edition. New Delhi, Delhi: Vikas Publishing House. 2. Johri, B.M. (1984). Embryology of Angiosperms. Netherlands: Springer-Verlag. 3. Raghavan, V. (2000). Developmental Biology of Flowering plants. Netherlands: Springer 76 4. Shivanna, K.R. (2003). Pollen Biology and Biotechnology. New Delhi, Delhi: Oxford and IBH Publishing Co. Pvt. Ltd.