

Discipline Centric Elective Course – E02

Course Code: PGBOT18E705

REPRODUCTIVE & DEVELOPMENTAL BIOLOGY OF PLANTS

CREDITS -03
INTERNAL-15

MARKS 75
EXTERNAL-60

Unit: I

Flower development: Initiation of floral evocation, floral organ formation, flowering in perennials, seasonal flowering, polycarpy and biennial bearing.

Male and female gametophyte: Initiation and structure of anther, role of tapetum, microsporogenesis and development of pollen, regulation of asymmetric first pollen mitosis, control of second pollen mitosis and sperm cell differentiation, female gametophyte development: initiation.

Unit: II

Patterns in plant development: growth, differentiation and development, genetic control and hormonal regulation of development, Role phytohormones in plant development.

Leaf growth and differentiation determination: phyllotaxy; control of leaf form; differentiation of epidermis with special reference to stomata, trichomes, and mesophyll secretory structures and laticifers. Transition to flowering, floral meristems and floral development in *Arabidopsis* and *Antirrhinum*.

Unit: III

Pollination: pollen-pistil interaction and fertilization: pollination mechanism, pollination syndromes, structure of pistil, pollen germination and compatible pollen-stigma interactions, sporophytic and gametophytic self-incompatibility, pollen tube growth and guidance, double fertilization.

Seed development, fruit growth and dormancy: endosperm development, embryogenesis, landmarks of embryo pattern formation, polyembryony and apomixis, dynamics of fruit growth, importance and types of dormancy, seed dormancy, overcoming seed dormancy and bud dormancy.

Unit: IV

Shoot development: organization of the shoot apical meristem (SAM); cytological and molecular analysis of SAM; mechanisms of cell division and cell to cell communication; tissue differentiation with reference to xylem and phloem.

Wood development in relation to environmental factors.

Root development: organization of root apical meristem (RAM); vascular tissue differentiation; lateral roots, root hairs.

Senescence and programmed cell death (PCD): concept, types of cell death. PCD in the life cycle of plants, metabolic changes associated with senescence.

DEPARTMENT OF BOTANY
SRI PRATAP (GOVT.) COLLEGE SRINAGAR
CLUSTER UNIVERSITY SRINAGAR SYLLABUS FOR IG PHASE-II /PG BOTANY
EFFECTIVE FROM ACADEMIC SESSION 2021

Suggested readings:

01. Ueli Grossniklaus Edt. (2019). Plant Development and Evolution. Academic Press.
02. SHI J. (2018). Plant Development & Reproduction. Magnum Publishing House New Delhi.
03. Mauro Cresti, Stephen Blackmore, Jacobus L. van Went (2012). Atlas of Sexual Reproduction in Flowering Plants. Springer Verlag Berlin.
04. Mishra SR (2009) Understanding Plant Reproduction. Discovery Publishing House New Delhi.
05. Rajeshwari Sharma & A.K. Sharma (2009). Structure Development and Reproduction in Flowering Plants. Jagdhamba Publishing Co. New Delhi.
06. Raghvan, V. (2006). Double fertilization. Springer Verlag, Berlin-Heidelberg.
07. Raghavan, V. (2000). Developmental Biology of Flowering Plants. Springer-Verlag, New York.
08. Bhojwani, S.S. and Bhatnagar, S.P. (2000). The Embryology of Angiosperms. 4 th Edn. Vikas Publishing House, New Delhi.
09. Atwell, B.J., Knedermann, P.E. and Jumbull, C.G.N. (1999). Plants in Action-Adaption in Nature: Performance in cultivation. MacMillan Education, Sydney, Australia.
10. Geber, M.A., Dawson, T.E. and Delph, L.F. (1999). Gender and Sexual dimorphism in Flowering Plants. Springer Berlin-Heidelberg.
11. Howell, S.H. (1998). Molecular Genetics of Plant Development. Cambridge University press, Cambridge.
12. Raghavan, V. (1997). Molecular Embryology of Flowering Plants. Cambridge University Press, Cambridge.
13. Fosket, D.E. (1994). Plant Growth and Development: A Molecular Approach. Academic Press, San Diego.
14. Bewley, J.D. and Black, M. (1994). Seeds Physiology of Development and Germination. Plenum Press, New York.
15. The Plant Cell. Special issue on Reproductive Biology of Plants, Vol. 5(10) (1993). The American society of Plant Physiologists. Rockvills, Maryland, USA.
16. Salisbury, F.B. and Ross, C.W. (1992). Plant Physiology. 4th Edn. Wadsworth Publishing, Bolmont, California.
17. Lyndow, R.F. (1990). Plant Development: The Cellular Basis. Unnin Hyman, London.
18. Steeves, T.A. and Sussex, I.M. (1989). Patterns in Plant development. 2nd Edn. Cambridge Univ. Press, Cambridge.
19. Leivs, P., Tucker, S.C. and Endress, P.K. (1988). Aspects of Floral Development. J. Cramer, Germany.
20. Murphy, T.H. and Thompson, W.F. (1988). Molecular Plant Development. Prentice Hall, New Jersey.
21. Burgess, J. (1985). An Introduction to Plant Cell development. Cambridge University Press, Cambridge.