ST. JOSEPH’S COLLEGE FOR WOMEN (AUTONOMOUS) VISAKHAPATNAM

III SEMESTER **BOTANY** TIME:4HRS/WEEK **ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS, PLANT ECOLOGY AND BIODIVERSITY**

B 3102 (3) **SYLLABUS** MARKS: 100

w.e.f.20-21 admitted batch-“20AH”

**OBJECTIVES:** To enable the students to -

* Understand the plant anatomy like tissue, tissue systems in the plant body
* Get an insight into various aspects of embryology of Plants
* Learn basic concepts of Ecology and environment.
* Gain knowledge in various aspects of Population, Community and Production Ecology.
* Know the importance and value of Bio diversity

**COURSE OUTCOMES:** On successful completion of this course, the students will be able to:

CO 1: Understand on the organization of tissues and tissue systems in plants.

CO 2: Illustrate and interpret various aspects of embryology.

CO 3: Discuss the basic concepts of plant ecology, andevaluate the effects of environmental and biotic factors on plant communities.

CO 4: Appraise various qualitative and quantitative parameters to study the population and community ecology.

CO 5: Correlate the importance of biodiversity and consequences due to its loss.

CO 6: Enlistthe endemic/endangered flora and fauna from two biodiversity hot spots in India and assess strategies fortheirconservation.

# UNIT–I:ANATOMY OF ANGIOSPERMS :

1. Organization of apical meristems:Tunica-carpus theory and Histogen theory.
2. Tissue systems–Epidermal, ground and vascular.
3. Anomalous secondary growth in Boerhaavia and Dracaena.
4. Study of timbers of economic importance-Teak, Red sanders and Rosewood.

# UNIT–II: EMBRYOLOGY OF ANGIOSPERMS:

1. Structure of anther, anther wall, types of tapetum. Microsporogenesis and development of male gametophyte.
2. Structure of ovule, mega sporogenesis; monosporic (Polygonum), bisporic (Allium)and tetrasporic (Peperomia) types of embryo sacs.
3. Outlines of pollination, pollen–pistilinteraction and fertilization.
4. Endosperm - Types and biological importance - Free nuclear, cellular, helobial and ruminate.
5. Development of Dicot (Capsellabursa-pastoris)embryo.

# UNIT–III: BASICS OF ECOLOGY:

1. Ecology: definition, branches and significance of ecology.
2. Ecosystem: Concept and components, energy flow, food chain, food web, ecological pyramids.
3. Plants and environment: Climatic (light and temperature), edaphic and bioticfactors.
4. Ecological succession : Hydrosere and Xerosere.

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# UNIT–IV: POPULATION, COMMUNITY AND PRODUCTION ECOLOGY :

1. Population ecology: Natality, mortality, growth curves, ecotypes, ecads
2. Community ecology: Frequency, density, cover, lifeforms, biological spectrum
3. Concepts of productivity: GPP,NPP and Community Respiration
4. Secondary production, P/R ratio and Ecosystems.

# UNIT–V: BASICS OF BIODIVERSITY:

1. Biodiversity: Basic concepts, Conventionon Biodiversity-Earth Summit.
2. Value of Biodiversity; types and levels of biodiversity and Threats to biodiversity
3. Biodiversity Hot spots in India.Biodiversity in North Eastern Himalayas and Western Ghats.
4. Principles of conservation: IUCN threat-categories, RED databook
5. Role of NBPGR and NBA in the conservation of Biodiversity.

# TEXTBOOKS:

* Pandey,B.P.(2013)College Botany,VolumeII,S.Chand Publishing, NewDelhi
* Pandey,B.P.(2013)College Botany, Volume III, S.Chand Publishing, NewDelhi Bhattacharya, K.,G.Hait & Ghosh, A.K.,(2011)A Text Book of Botany, Volume-II, New Central Book Agency Pvt. Ltd., Kolkata

# BOOKS FOR REFERENCE:

* Esau,K. (1971) Anatomy of Seed Plants. John Wiley and Son, USA.
* Fahn,A. (1990) Plant Anatomy, Pergamon Press, Oxford.
* Cutler, D.F., T. Botha & D. Wm. Stevenson (2008) Plant Anatomy: An Applied Approach,Wiley, USA.
* Bhojwani,S.S. and S.P.Bhatnagar (2000)The Embryology of Angiosperms(4thEd.), Vikas Publishing House, Delhi.
* Pandey,A.K.(2000)Introduction to Embryology of Angiosperms. CBS Publishers & Distributors Pvt.Ltd., New Delhi
* Maheswari,P.(1971) An Introduction to Embryology of Angiosperms. McGraw Hill Book Co.,London.
* Johri,B.M.(2011)Embryology of Angio sperms. Springer-Verlag, Berlin Pandey, B.P.(2013)College Botany, Volume-III, S.Chand Publishing, New Delhi
* Bhattacharya, K., A.K.Ghosh, & G.Hait (2011)A Text Book of Botany, Volume-IV, New Central Book Agency Pvt. Ltd., Kolkata
* Kormondy, Edward J. (1996) Concepts of Ecology,Prentice-Hall of India PrivateLimited,NewDelhi
* EugeneP.Odum(1996) Fundamentals of Ecology, Natraj Publishers, Dehradun
* Sharma, P.D. (2012) Ecology and Environment. Rastogi Publications, Meerut,India.
* Kumar,H.D.(1992)Modern Concepts of Ecology(7thEdn.,)Vikas Publishing Co.,NewDelhi.
* Newman,E.I. (2000):Applied Ecology Blackwell Scientific Publisher,U.K.
* Chapman, J.L & M.J.Reiss (1992):Ecology-Principles & Applications. Cambridge University Press, U.K.
* U.Kumar (2007) Biodiversity: Principles & Conservation, Agrobios(India), Jodhpur

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