

V.S.M. COLLEGE (A), RAMACHANDRAPURAM
III B.Sc., SEMESTER- V, BOTANY SYLLABUS
PAPER-VI: PLANT ECOLOGY & PHYTOGEOGRAPHY
PAPER CODE -1652506

Total hours of teaching 60 hrs @ 3 hrs per week

Credits:3

UNIT – I. Elements of Ecology

(12 hrs)

1. Ecology: definition, branches and significance of ecology.
2. Climatic Factors: Light, Temperature, precipitation.
3. Edaphic Factor: Origin, formation, composition of soil and soil profile.
4. Biotic Factor: Interactions between plants and animals.

UNIT– II. Ecosystem Ecology

(12 hrs)

1. Ecosystem: Concept and components, energy flow, Food chain, Food web, Ecological pyramids.
2. Productivity of ecosystem-Primary, Secondary and Net productivity.
3. Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.

UNIT – III. Population & Community Ecology

(12 hrs)

1. Population -definition, characteristics and importance, outlines –ecotypes.
2. Plant communities- characters of a community, outlines – Frequency, density, cover, life forms, competition.
3. Interaction between plants growing in a community.
4. Plant succession (Hydrosere and Xerosere)

UNIT – IV. Phytogeography

(12 hrs)

1. Principles of Phytogeography, Distribution (Endemic and discontinuous species)
2. Phytogeographic regions of India.
3. Phytogeographic regions of World.
4. Endemism – types and causes

UNIT- V: Plant Biodiversity and its importance

(12 hrs)

1. Definition, levels of biodiversity-genetic, species and ecosystem.
2. Biodiversity hotspots- Criteria, Biodiversity hotspots of India.
3. Loss of biodiversity – causes and conservation (*In-situ* and *ex-situ* methods).
4. Seed banks - conservation of genetic resources and their importance
5. Role of UNDP, UNEP and NBA in conservation of biodiversity.

Additional Inputs:

1. Environmental and Wild life Acts

Suggested activity:


1. Collection of different soils, studying their texture.
2. Observing polluted water bodies.
3. Student study projects.
4. Debates on man's activity on ecosystem and biodiversity conservation methods.
5. Visiting a nearest natural vegetation area.


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III B.Sc., SEMESTER- V

Prescribed Books:


Cell biology, Genetics, Ecology and Biodiversity- Telugu Academy publications (old).
Plant Ecology and Phytogeography- Vikas Publications


Books for Reference:

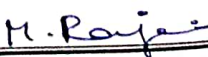
1. Daubenmire, R.F. (): Plants & Environment (2nd Edn.,) John Wiley & Sons., New York.
2. Puri, .G.S. (1960): Indian Forest Ecology (Vol.I & II) Oxford Book Co., New Delhi & Calcutta.
3. Billings, W.B. (1965): Plants and the Ecosystem Wadsworth Publishing Co., Inc., Belmont.
4. Misra, R. (1968): The Ecology work Book Oxford & INH Publishing Co., Calcutta
5. Odum E.P. (1971): Fundamentals of Ecology (2nd Edn.,) Saunders & Co., Philadelphia & Natraj Publishers, Dehradun.
6. Odum E.P. (1975): Ecology By Holt, Rinert & Winston.
7. Oosting, H.G. (1978): Plants and Ecosystem Wadworth Belmont.
8. Kochhar, P.L. (1975): Plant Ecology. (9th Edn.,) New Delhi, Bombay, Calcutta-226pp.,
9. Kumar, H.D. (1992): Modern Concepts of Ecology (7th Edn.,) Vikas Publishing Co., New Delhi.
10. Kumar H.D. (2000): Biodiversity & Sustainable Conservation Oxford & IBH Publishing Co Ltd. New Delhi.
11. Newman, E.I. (2000): Applied Ecology Blackwell Scientific Publisher, U.K.
12. Chapman, J.L&M.J. Reiss (1992): ecology (Principles & Applications). Cambridge University Press, U.K.
13. Cain, S.A . (1944): Foundations of Plant Geography Harper & Brothers, N.Y.
14. Mani, M.S (1974): Ecology & Biogeography of India Dr. W. Junk Publishers, The Haque
15. Good, R. (1997): The Geography of flowering Plants (2nd Edn.) Longmans, Green & Co., Inc., London & Allied Science Publishers, New Delhi


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III B.Sc.: SEMESTER- VI: CLUSTER ELECTIVE -A PAPER VIII-A-1: PLANT DIVERSITY AND HUMAN WELFARE

PAPER CODE-1662510

Total hours of teaching 60hrs @ 3hrs per week

Credits : 3

Unit-I: Plant diversity and its scope: (12hrs)

1. Genetic diversity, Species diversity, Plant diversity at the ecosystem level, Agro biodiversity and cultivated plant taxa, wild taxa.
2. Values and uses of biodiversity: Ethical and aesthetic values,
3. Methodologies for valuation, Uses of plants.

Unit -II: Loss of biodiversity: (12hrs)

1. Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro biodiversity, projected scenario for biodiversity loss.
2. Management of plant biodiversity: Organizations associated with biodiversity management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR, Biodiversity legislation and conservations, Biodiversity information management and communication.

Unit-III: Contemporary practices in resource management: (12hrs)

1. Environmental Impact Assessment (EIA), Geographical Information System GIS, Participatory resource appraisal, Ecological footprint with emphasis on carbon footprint, Resource accounting;
2. Solid and liquid waste management

Unit -IV: Conservation of biodiversity (12hrs)


1. Conservation of genetic diversity, species diversity and ecosystem diversity, *In situ* and *ex situ* conservation.
2. Social approaches to conservation, Biodiversity awareness programmes, Sustainable development.


Unit- V: Role of plants in relation to Human Welfare (12hrs)

1. Importance of forestry, their utilization and commercial aspects-
a) Avenue trees, b) Ornamental plants of India. c) Alcoholic beverages through ages.
2. Fruits and nuts: Important fruit crops their commercial importance. Wood, fiber and their uses.


Suggested activities:

1. Study of flora and its diversity in the college campus or local area.
2. Enumerating wild and exotic species(*Parthenium*, Water hyacinth etc.)
3. Student Study Project work on any one of the International organizations striving for preservation of biodiversity.
4. Study of conservation efforts of local people, and civic bodies.
5. Study of locally available fruits in different seasons.
6. Enumerating the avenue plantations and their diversity in your town/city.


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III B.Sc.: SEMESTER- VI: CLUSTER ELECTIVE -A

Suggested Readings:

1. Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity -Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.


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PAPER CODE: 303: PLANT ECOLOGY, BIODIVERSITY AND CONSERVATION

HOURS : 8

CREDITS : 4

Theory

UNIT - I

Ecology – A synthetic approach. Major biomes and Vegetational patterns of the World. Major Vegetational and Soil types of India.

Community ecology: Methods of study of plant communities, qualitative study of plants communities. Stratification of Life forms and physiognomy, normal biological spectrum.

UNIT - II

Quantitative study of plant communities, distribution pattern frequency, density, canopy, basal area

and cover

Synthetic characters of Community, Similarity Index, general account of classification of communities

Population Ecology: Population structure, characteristics of population; population density, Natality, Mortality, Age distribution, Biotic potential, Population growth forms and curves.

Population fluctuation and population dispersal

UNIT - III

Plant Biodiversity: Concept, Status in India, Utilization and concerns, World Centers of primary diversity of domesticated plants. **The Indo Burmese Centre**, plant introduction and secondary centers.

UNIT - IV

Principles of Conservation: Strategies for conservation, in situ conservation, protected areas in India- Biosphere reserves, wetlands, mangroves, conservation of wild biodiversity, strategies for conservation – ex situ conservation. Principles and practices. Botanical gardens, BSI, ICAR and

CSIR.

Suggested Laboratory Exercises

1. study vegetation in the botanical gardens
2. To prepare life forms of local botanical gardens and prepare a biological spectrum
3. To determine the minimal size and number of quadrates required for reliable estimate of biomass in grass land
4. Quantitative analysis of vegetation: relative frequency, density, relative density, basal area and IVI
5. To estimate rate of Carbon dioxide evolution from different soils using soda lime or alkali absorption method
6. Scientific visits:

A protected areas or Biosphere reserve or national park or sanctuary

A wetland, Mangrove, NBPGR (National Bureau of Plant Genetic Resources – New Delhi)

BSI, CSIR Laboratories, FRI and Tropical Botanical Gardens

Suggested Readings & Text Books

01. APHA – Standard Methods for the Examination of Water and Waste Water. American Public Health Association, Washington, DC
02. Frankel, OH. Brown, A.H.D. & Burdon, J.J. 1995. The conservation of Plant Diversity, Cambridge University Press, Cambridge, UK
03. Krebs, C.J. 1989. Ecological Methodology. Harper and Row, New York, USA
04. Ludwig, J.A. and Reynolds, J.F. 1988. Statistical Ecology. Wiley, New York
05. Magurran, A.E. 1988. Ecological Diversity and its measurement. Chapman and Hall, London
06. Moore, P.W. and Chapman, S.B. 1986. Methods in Plant Ecology Blackwell Scientific

Publication

07. Molles, M.C. 2005. Ecology-concepts and applications. Mc GrawHill. Boston
08. Muller – Dombois, DD. And Ellenberg, R. 1974. Aims and Methods of Vegetation Ecology, Wiley, New York
09. Begon Michael, Colin Townsend & John L. Harper. 2005. Ecology, From Individuals to Ecosystems. 4th ed.Black well Publishing, Oxford.
10. Odum.E.P. & Gary W.Barrett. 2005. Ecology.Tomson Brooks/Cole, Singapore.
11. Sokal, R.R. and Rohit, F.J.1995. Biometry. W.H. Freeman & Co., San Francisco
12. Cunningham, W.P. & M.A.Cunningham 2007. Principles of Environmental Science-Inquiry and applications. Tata Mc GrawHill Pub.New Delhi.
13. Heywood, V.M. and Watson, R.T. 1985. Global Biodiversity Assessment, Cambridge Univ. Press, Cambridge.
14. Ricklefs, R,E. &Gary L. Miller. 2000.Ecology. 4th ed. W.H. Freeman and Company. New York
15. Richard T. Wight 2005. Environmental Scence. 9th ed. Pearson Prentice Hall. New Delhi.
16. Given, D.R.. 1995. Principles and practice of plant conservation. Timber Press, Oregon
17. Jensen, John R. 2007. Remote Sensing of the Environment: An Earth Resource Perspective.PHI.
18. Krishnamurthy, K.V. 2004. Advanced Textbook On Biodiversity: Principles And Practice. Oxford
19. Sabins, F.F.2007. Remote Sensing-principles and interpretation. 3rded. Waveland Press Inc