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

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