MANGALORE UNIVERSITY

Department of Biosciences
MSc Biosciences

OPEN ELECTIVE COURSES

BSE461 BIODIVERSITY

Course Outcomes:

After successful completion of the course, students will be able to :

- Gain theoretical knowledge and appreciate the importance of biodiversity.
- Understand the relevance of biodiversity in conservation.
- Become familiar with and understand the key terminologies of Ecology.
- Describe the levels of biodiversity organizations.
- Know about Indian ecological/geographical diversity, including Himalayan region, Desert.
- Western Ghats, Coastal region and Hotspots of biodiversity.
- Understand what is microbial diversity and its importance.
- Know how to culture bacteria in lab for various microbial products.

Unit I (13 hours)

Basic concepts and definitions, scope, biosphere, habitats, food chain, food web. Levels of biodiversity organizations – Genetic diversity, Species diversity and Ecosystem diversity. Indian ecological/geographical diversity: Himalayan Region, Deserts, Semiarid region, Gangetic plains, Western Ghats, Coastal region; Hotspots of biodiversity,

Microbial diversity : Bacteria, Cyanobacteria, Fungi and Lichens, Algae, Protozoa and viruses, habitat. Mushrooms – edible and nonedible. Plant and animal association with microbes. Beneficial and harmful microbes, Culture, Cultivation of bacteria. Microbial products.

Unit II (13 hours)

Plant diversity : Lower and higher group of plants, plant ecosystem and its classification. Major ecosystem types, tropical forests, temperate forests. Arid and Semiarid ecosystems, boreal forests, Arctic and Alpine systems, grasslands, wetland ecosystem. Marine ecosystems, Epiphytes, parasites and orchids. Values and uses of plant diversity.

Animal diversity: Lower and higher group of animals, their ecological niches. Zoogeographical regions of the world and India. Animals in temperate, tropical and boreal forests, cave and mountains, Coastal ecosystems, mangrove and estuaries, coral reefs.

Unit III (13 hours)

Biodiversity Conservation: Causes and prevention of Plant and Animal biodiversity loss; IUCN Red List Categories and Criteria;
Conservation strategies – *Ex-situ* and *In-situ* conservation, Protected ecosystems – Biosphere reserves, National parks, Sanctuaries, Botanical gardens, Sacred groves; Wildlife conservation and wildlife conservation act; Centers of diversity study.

References:

1. Daniel, J.C. A century of natural history. Bombay natural History Society, Bombay. M 697pp.
2. Dwivedi,A.P., 1993. Forests. International book Distributors, Dehra Dun. 352 pp.
3. Eugene, P. Odum, 1983. Basic Ecology. Saunders College, London.
4. Gugjisberg, C.A.W., 1970. Man and Wildlife, Arco Publishing Company Inc., New York.
5. Haywood, V.H. and Watson, R.T., 1995. Global biodiversity assessment. United Nations Environmental Programme,New York.
6. Korringa, P., 1976. Farming of marine organisms law in the food chain. Elsevier, Amsterdam. 264 pp.
7. Levinton, J.S., 1982. Marine ecology, Prentice Hall, Englewood Cliffs. 526 pp.
8. Lieth, H., 1989. Tropical rain forest ecosystems. Elsevier, Amsterdam. 713 pp.
9. Southwood, T.R.E., 1978. Ecological methods, Chapman and Hall, London. 524 pp.
10. Tiwari, S.K., 1985. Readings in Indian Zoogeography. Today and Tomorrow's Printers and Publishers, New Delhi. 604 pp.
11. Nybakkan, J.N., 1982. Marine Biology – An ecological approach. Harper and Raw Publ., New York.
12. Reddy, P.A., 2000. Wetland ecology. Cambridge University Press, London. 614 pp.
13. Krishnamoorthy, K.V 2003. An advanced textbook on Biodiversity. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi. pp. 260.
14. Brummit, R.K. 1992, Vascular Plant Families and Genera, Royal Botanic Gardens, Kew, England.
15. IUCN, 1992. Protected Areas of the World: A Review of National Systems (4 Vols.) WCMC, Cambridge and IUCN Commission on National Parks and Protected Areas, IUCN, Gland, Switzerland.
16. IUCN, 1993. Draft IUCN Red List Categories. IUCN, Gland, Switzerland.
17. IUCN, 1994b. Guidelines for Protected Area Management Categories. WCMC, Cambridge and IUCN Commission on National Parks and Protected Areas. Gland, Switzerland.
18. IUCN, 1995. IUCN Red List Categories. IUCN, Gland, Switzerland.
19. Janzen, d.h. 1986. Tropical dry forests- the most endangered major tropical ecosystem. In: Wilson, E.O. and Peters, F.M. (eds.) Biodiversity. National Academy Press, Washington DC, pp. 130-137.
20. Kushalappa, C.G. and Bhagwat, S.A. 2001. Sacred groves: Biodiversity, threats and conservation. In: Uma Shanker, R., Ganeshaiah, K.N. and Bawa, K.S. (Eds.) Forest Genetic Resources: Status, Threats and Conservation Strategies. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi, pp. 21-29.
21. Lovelock, J,E. 1988a. The Earth as a living system. In: Wilson, E.O. and Peters, F.M. (Eds.) Biodiversity. National Academy Press, Washington DC, pp. 486-489.
22. Magurran, A.E. 1998. Ecological Diversity and its Measurememnt.

Princeton Univ. Press, Princeton, NJ.
23. Pearce, D.W. and D. Moran 1994. The Economic Value of Biological Diversity. Earthscan London.