ADVANCE ZOOLOGY VI (ENVIRONMENTAL BIOLOGY)

CREDIT HOURS: 3+1

Objectives:

The aim of this course is to make the students aware that all the living organisms including human beings are part of the environment, which consists of biotic and abiotic factors. The abiotic factors consist of all the physical factors while biotic factors include all the living things. However with the increase in population densities increase in productivity is also needed. High technologymeasures used for this purpose have caused various problems like pollution.

Course Contents

An overview of concepts of ecosystem with emphasis on interaction and homeostasis.Basic global ecosystems (atmosphere, hydrosphere, lithosphere, ecosphere). Biogeochemical cycle: nitrogen, phosphorus, sulpher, water, carbon, nutrient. Limiting factors: basic concepts, temperature, soil, water and humidity, light, fire. Energy: laws of thermodynamics, primary and secondary productions, trophic levels and energy variation with increasing trophic levels, energy flow, food chains and food webs. Population ecology: basic population characters, growth and growth curves, population dynamics and regulations. Community ecology: basic concepts, community analysis, ecotones, inter-population interactions. Ecological niche: basic concepts and types. An overview of major biomes of the world. Applied Ecology: Resources and their ecological management (mineral, agricultural and forest, range management, desalination and weather modification, landscape and land use); Pollution (definition, types, cost, origin and management); water (sources, domestic and industrial pollution, heavy metals, water purification, waste water treatment); air (sulpher dioxide, nitrogen oxide, carbon monoxide, ozone, smog and PAN, MTBE & CFCs); land pollution (pesticides, bacterial toxins, synthetic hormones); noise pollution. Radiation.Space biology. Contemporary environmental themes: (ozone depletion, acid rain, green house effect and global warming, desertification, deforestation, exotic and invasive species, radioactivity leakage, environmental laws).

Evaluation Criteria

Examination	Type	Marks
Internal Examination	Sessional Work	15%
	Mid-Semester	25%
External Examination	Final Semester	60%

Books Recommended

Chapman, J. L. & Reiss, M. J. (1997).*Ecology: principles and applications.* Cambridge Univ. Press, UK.

Cox, C. B. &Morre, D. (2000).*Biogeography: an Ecological and Evolutionary Approach*, (6th ed.), Life Sciences King's College, London, UK.

Dondson, S.I., Allen, T.F.N., Carpenter, S.R., Ives, A., Jeanne, R.L., Kitchell, J.F., Langston, N.E. & Turner, M.G., (1998). *Ecology*.UK: Oxford Univ. Press.

Molles, M.C. (2005).*Ecology: Concepts and Applications*.(6th ed.), New York, USA: McGraw Hill.

Newman, I. (1993). *Applied Ecology*. UK: Black Well Scientific Publications Oxford.

Odum, E. P. (1994). *Fundamentals of Ecology*.(3rd ed.), Philadelphia: W.B. Saunders.

Slingsby, D. & Cook, C., (1986). *Practical Ecology*. UK: McMillan Education Ltd.

Smith, R.L. (1980). *Ecology And Field Biology*, Harper and Row.

ADVANCE ZOOLOGY VI (ENVIRONMENTAL BIOLOGY) PRACTICALS

1. Measurement of environmental factors on land, water and air.
2. Study ofdifferent ecosystems: pond, agricultural or grassland, forest.
3. Community analysis through different sampling techniques (quadrat, Transect). Population dynamics of grasshoppers.
4. Adaptive features of animals in relation to food and environment.
5. Food chain studies through analysis of gut contents.
6. Analysis of polluted and fresh water for biotic and abiotic variations.
7. Field visits for study of selected terrestrial habitat and writing notes.
8. Development of an ecological management plan of some selected area.

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