ZOOL-305A & 305L **ECOLOGY** **Cr. 3(2+1)**

Course Objectives:

The objectives of the course are:-

1. To enable the student to understand habitat and Ecology
2. To develop expertise in the students about the contemporary themes of Ecology and ecosystems
3. To understand global Environmental threats and their mittigation

Course Learning Outcomes:

Upon successful completion of the course, the student will be able to:

1. Understand and applythe basic concepts of Ecology
2. Acquiretheoretical knowledge for rehabilitation of destroyed ecosystems and habitats in the environment.
3. Solve the ecological Problems and their management through scientific approach

Course Outline:

1. Energy

- Basic Concepts of and Types of Ecology
- Laws of thermodynamics, primary and secondary productions
- Trophic levels and energy variation with increasing trophic levels, energy flow, food chains and food webs.

2. Biogeochemical Cycle:

- Nitrogen, Phosphorus, Sulpher, Water, Carbon and nutrient.

3. Limiting Actors

- Basic Concepts, Temperature, Soil, Water and Humidity, Light and Fire.

4. Global Ecosystems:

- Atmosphere, Hydrosphere, Lithosphere and Ecosphere.
- An overview of Ecosystem with special reference to Ecological Niche, basic concepts and types
- Major ecosystem of world, Forest, Grassland, Desert, Tundra and Agricultural ecosystems.
- Marine, Estuarine, Freshwater and Wetlands

5. Population Ecology

- Basic population characters, Growth and Growth Curves, Population Dynamics and Regulations**.**

6. Community Ecology

- Basic concepts, Community Analysis, Ecotones, Inter-population Interactions

7. Applied Ecology: resources and their ecological management;

- Mineral, Agricultural Desalination, Weather Modification, Forest and Range Management, Landscape and Land use

8. Pollution:

- Definition, Types, Water, Air, Land and Noise, Sources and Management.

9. Radiation Ecology:

- Global Environmental Changes (ozone depletion, acid rain, greenhouse effect and global warming, Koyota protocol, Radioactivity leakage, Environmental laws).

10. Exotic and Invasive Species

- Desertification, Deforestation, exotic and invasive species

Practical:

1. Population Sampling Techniques (Quadrate, Line Transact, Point count, Focal Scan and Capture and Recapture Method).
2. Study of different Ecosystems (Fresh Water, Terrestrial, Marine/ Mountain/ Desert).Ecological Notes.
3. Measurements of physical Factors of different Ecosystems.
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. Experimental design and approaches in ecological research; writing a research project
9. Development of an ecological management plan of some selected area

Teaching-Learning Strategies

Teaching will be a combination of class lectures, class discussions, and group work. Short videos/films will be shown on occasion.

Assignments

The sessional work will be a combination of written assignments, class quizzes, presentation, and class participation/attendance.

Assessments and Examination

Text and Reference Books:

1. Molles, M.C. 2005. Ecology: Concepts and Applications. 6th Ed., McGraw Hill, New York, USA.
2. Cox, C.B., Morre, D. 2000. Biogeography: An Ecological and Evolutionary Approach, 6th Ed., Life Sciences King's College, London, UK.
3. 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. Oxford Univ. Press, UK.
4. Chapman, J.L., Reiss, M.J.1997. Ecology: Principles and Applications. Cambridge Univ. Press, UK.
5. Odum, E. P. 1994. Fundamentals of Ecology. 3rd Ed. W.B. Saunders.Philadelphia.
6. Newman, I. 1993. Applied Ecology. Black Well Scientific Publications Oxford. UK.
7. Slingsby, D., Cook, C., 1986. Practical Ecology. McMillan Education Ltd. UK.