LSC 506 - ECOLOGY AND EVOLUTIONARY BIOLOGY

1. Aquatic and terrestrial ecology, concept of population and community, succession process, competition and coexistence, types of interactions, predations, parasitism, antibiosis, commensalism, cooperation and mutualism, population growth.

2. Abiotic and biotic environment, limiting factors, adaptation, habitat and niche, nature of environment. Biosphere, biomes, population parameters, structure, growth regulation, interactions between populations.

3. Ecosystem, types, characteristics, structure and function of ecosystems, population dynamics, carrying capacity, sustainable field, components of ecosystem, food web, producer, consumer, decomposer, biotic and abiotic components, ecological pyramids, bioaccumulation and bio-magnifications- mass and energy transfer successive tropical level.

4. Energy flow and fixation, ecological pyramids. Biogeochemical cycles, hydrological cycle, carbon, oxygen, nitrogen, sulfur and phosphorus cycles – their importance and applications.

5. Ecological succession, primary and secondary successions, ecological climax, impacts of development on ecosystem.

6. Biodiversity - Concept, components, types, ecological and economical importance, key stone, umbrella and flagships species, ecotone and niche.

7. Biodiversity - values, national and global status, hotspot; threatened species - IUCN Red list**,** endangered species, vulnerable species, rare species, extinct species and endemic species; effects of climate change.

8. Biodiversity conservation - *in situ* & *ex situ*, species management, bio-prospecting, commercialization, gene banks, transfer of technology and related IPR issues; roles of International bodies, UN, WTO, FAO, WIPO.

9. Evolutionary biology before Darwin, Darwinism, after Darwin, evolutionary synthesis, fact and theory.

10. Microevolution - concept, history, theories, genetic drift, gene flow, mutation and selection.

11. Macroevolution - concept, history, theories, hierarchy, speciation, extinction.

12. Human evolution

Suggested Readings

1. Fundamentals of Ecology - by Eugene P. Odum
2. Biological Diversity: Frontiers in Measurement and Assessment – by A.E. Magurran, B.J. McGill
3. Evolutionary Biology – by Douglas J. Futuyma