

Paper: ZL807C Environmental Biology and Animal Behaviour (Credit 4)

First Half Environmental Biology Credit 2

Sl. No.	Topics	Classes (hrs)
1.	Environmental zoology: scope, principle and definition	2
2.	Physico-chemical and biological factors affecting terrestrial and aquatic environment; comparison of stressed and non-stressed environment	4
3.	Spheres of earth: atmosphere, hydrosphere, lithosphere and biosphere; mass and energy transfer across different interfaces. Climate change and global warming- GHG, causes and effects; adaptations; management	4
4.	Natural resources, conservation and sustainable development	2
5.	Environmental pollution and their control methods- case studies (sugarcane, leather and paper mill)	5
6.	Input and effects of organic loading on sedimentation-DO, BOD, COD and NOD	2
7.	Soil: inputs of heavy metals on ecosystem (arsenic, lead, cadmium) and their management	4
8.	Bioindicator: concept and their uses in environment	5
	Class Tests	2
	Class Discussion	2
	Total	32

Second Half Animal Behaviour Credit 2

Sl. No.	Topics	Classes (hrs)
1.	Basic component of animal behaviour: proximate cause, ultimate cause, adaptive values; innate behaviour – mechanism with examples; learning behaviour – mechanism with examples	4
2.	Behavioural genetics: genetics basis of behaviour – examples; selection of behaviour with life history fitness attributes - examples	4
3.	Cognitive behaviour: problem solving solution in non-human animals - examples	3
4.	Migratory behaviour: orientation – taxis and kinesis; long range migration in birds and fishes	3
5.	Animal communication: kinds of communication signals – levels of specificity; importance of communication in reproduction and group living; dance language of honeybees	5
6.	Behavioural ecology: foraging behaviour – optimization theory; territorial behaviour	5
7.	Altruism and group Living: kin selection – Hamilton's Rule, genetic relationship; evolution of social system – honey bees, leaf cutter ants, some vertebrates	4
	Class Tests	2
	Class Discussion	2
	Total	32

Paper: ZL904E**Aquatic Environmental Science****Credit – 2**

Sl. No.	Topics	Classes (hrs)
1.	Definition and scope of aquatic environmental biology, structure and function of aquatic ecosystem, wetland, pond, lake, river etc.	2
2.	Water and Light : scatter and diffusion, effects of UV radiation on aquatic fauna	2
3.	Thermal stratification and thermocline formation in lake, , flow of heat	2
4.	Contribution of atmospheric gases to aquatic ecosystem; Importance of wetlands as carbon sequester	1
5.	Gaseous biogeochemical cycle: Carbon and Oxygen cycle - diurnal and seasonal changes; Nitrogen cycle - forms of nitrogen, nitrogen fixation, dissolved organic nitrogen, eutrophication and control	3
6.	Sedimentary biogeochemical cycle: Phosphorus cycle, recycling of phosphorus, eutrophication and control	2
7.	Concept of meteorological data, climate change, causes and effects on biota, algae as carbon sequester, management	2
8.	Lentic and lotic resources- their conservation and sustainable development, basic characteristics of lentic and lotic environment, role of inorganic carbon and organic carbon (CO_2 , CO_3 , HCO_3 , H_2CO_3) and organic carbon	2
9.	Pesticides in freshwater: Origin, fate and effects on biota	3
10.	Marine ecosystem, its chemical characters and faunal distribution	2
11.	Estuarine ecosystem, its chemical characters and impact on faunal distribution	2
12.	Principles of analytical methods, Titrimetry, Gravimetry, Colorimetry and Spectrophotometry	2
13.	Hydrologic cycle, global water balance, ice sheets and fluctuations of sea levels, origin and composition of seawater, factors influencing the surface water, resources of oceans, ocean pollution, human use of surface and ground waters, groundwater pollution and control measures	3
	Class Tests	2
	Class Discussion	2
	Total	32

Paper: ZL905E1

Advance Animal Ecology

(Credit – 4)

First Half		Credit -2
Sl. No.	Topics	Classes (hrs)
1.	Life History Strategies <ul style="list-style-type: none"> Reproductive Strategies, Foraging strategies, Models Age Structure Mating System – Polygyny and Polyandry 	8
2.	Population Growth Models <ul style="list-style-type: none"> Deterministic Models – Geometric growth Stochastic Models Life Table Construction and Calculating Life Expectancy 	8
3.	Competition and Coexistence <ul style="list-style-type: none"> Species Interactions Intraspecific Competition Intraspecific Competition Coexistence of species Effects of Exotic Competitors on Native Fauna 	8
	Class Tests	2
	Class Discussion	2
Second Half		Credit 2
1.	Herbivore Ecology <ul style="list-style-type: none"> Plant defenses – physical and chemicals Effects of Herbivores on Plants - examples Effects of Plants on Herbivores - examples Secondary Chemicals 	8
2.	Metapopulations <ul style="list-style-type: none"> Concepts of Models Bottom –Up Factors Top-Down Factors Environmental Stress 	8
3.	Trophic Structure <ul style="list-style-type: none"> Food Web Patterns Thermodynamics of Energy Flow Guild Ecology Ecology of Interactions in coexisting species Keystone species 	8
4.	Conservation Ecology <ul style="list-style-type: none"> Methods of assessment of population status Conservation criteria and methods Genetic basis of conservation Examples from northeast India 	6
	Class Tests	2
	Class Discussion	2
	Total	62

Paper: ZL1007E1**Biodiversity****Credit 4**

First Half		Credit -2
Sl. No.	Topics	Classes (hrs)
1.	Global patterns in species richness: species richness gradients along latitude and longitude; global species richness; species richness and community function	8
2.	Species diversity: local and regional components of diversity; diversity in islands; niche concepts and diversity	8
3.	Methods of measuring diversity: diversity indices – dominance indices, information statistic indices, Shannon index, Brillouin index; rank abundance diagrams; community similarity – Jaccard coefficient, Sorenson coefficient; cluster analysis	10
	Class Test	2
	Class Discussion	2
Second Half		Credit 2
1.	Link between diversity and stability: community stability; theory of regulation of species diversity; diversity – stability hypothesis	8
2.	Field study of richness and diversity: butterflies; moths; rapid diversity assessment methods	8
3.	Conservation of biodiversity: the pressure on wildlife; maintaining biodiversity; biodiversity act of India; methods of conservation	10
	Class Tests	2
	Class Discussion	2
	Total	60