

## ENVIRONMENTAL BIOLOGY& EVOLUTION

Semester	Subject Code	Category	Lecture		Theory		Practical	Credits
			Hrs/ week	Total Hours/ Semester	Hrs/ week	Total Hours/ Semester		
II	21CPZO2B	Core-V	4	60	4	60	Nil	4

### COURSE OBJECTIVES

- To understand the nature of relationships among organisms that comprise functioning of ecosystem. To provide the knowledge on interactions between organisms and their environments to drive the dynamics of populations and communities.
- To know the different types of pollution and their management to protect the health and welfare of human population in the world.

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	To acquire knowledge on the ecosystem , energy transformations across tropic levels.	K3
CO2	To gain knowledge on physic-chemical parameters in coastal ecosystem and renewable and non renewable resources.	K4
CO3	To analyze the germplasm conservation, cryopreservation and environmental protection acts.	K4
CO4	To understand the concepts of evolution through fossil evidences.	K2
CO5	To know the process of evolution in mammals, genetic drift, hybridization and role of polyploidy.	K4

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

### MAPPING WITH PROGRAMME OUTCOME

COS	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	S
CO2	M	S	S	S	S
CO3	S	S	S	M	S
CO4	M	S	M	S	S
CO5	S	M	S	M	S

S- Strong; M – Medium ; L- Low

DISTRIBUTION OF MARKS: THEORY 100%

## **UNIT-I**

**12 Hours**

### **ECOSYSTEM AND COMMUNITY**

Review of concept of ecosystem - Physical environment; biotic environment; biotic and abiotic interactions - Natural and Man-made ecosystem, with examples. Energyflow - Trophic structure and levels - Pyramids, food chain and web - ecological efficiencies, and productivity and its measurement. Influence of competition, predation and disturbances -

**Community Ecology:** Nature of communities; community structure and attributes; levels of species diversity and its measurement; edges and ecotones

## **UNIT-II**

**12 Hours**

### **HABITAT AND RESOURCES ECOLOGY**

Biomass, Adaptations with reference to physico - chemical features of environment.

Aquatic environments (Freshwater, Marine and Eustarine) Terrestrial environments (Forest and Grass land)

Renewable and non - renewable resources - animal resources. Conventional and non - conventional energy sources.

## **UNIT III**

**13 Hours**

### **ENVIRONMENTAL CONSERVATION AND MANAGEMENT**

Principles of conservation - Rain water harvesting - Soil health and fauna - Biosphere reserves - agricultural ,Wildlife conservation and management (Project Tiger)- biodiversity - Germplasm conservation and cryopreservation. Problems of urbanization - Sewage, soil waste and industrial waste disposal and management. Social forestry - tribal welfare. Environmental Protection Act.

## **UNIT-IV**

**11 Hours**

### **EVIDENCES AND POLYMORPHISM**

**Evidences:** The need of evidences for the fact of evolution - evidences from comparative anatomy, embryology, physiology and biochemistry. Biogeography, Plate tectonics and continental drift - Evidences from systematic, evolutionary taxonomy - Paleontology – Evolutionary time scale-Era periods and Epoch.evolutionary trends in fossils, types of fossils.

**Mimicry** - Batesian and Mullerian mimicry and evolution.

**Polymorphism** - Transient and stable - Maintenance of polymorphism.

**UNIT-V****12 Hours****GENETIC BASIS OF EVOLUTION AND SPECIATION**

Mutations and their role in evolution - the concept of neutral evolution- population size and evolution - the role of genetic drift - hybridization and evolution - The role of polyploidy, isolating mechanisms - premating, post mating - problems of the origin of isolating mechanism. Genetics and Ecology of speciation. Mayer's founder principle and genetic evolution in the peripheral isolates - Ecological opportunities for speciation.

**Human Evolution-** Evolution of Man.

**TEXT BOOKS**

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	Berwer. A	The Science of ecology	Saunders's college publishing	1988
2.	AlphaSoli,I. Arceivala.	Wastewater treatment for pollution control	Second Ed. Tata McGraw Hill Publication Company Ltd., New Delhi.	1998
3.	P.A.Moody.	Introduction to Evolution	Harper International.	1978
4.	G.L. Stebbins.	Process of Organic Evolution	Prentice Hall India, New Delhi.	1979
5.	M. Grene.	Dimensions of Darwinism	Cambridge University Press. UK	1983

**REFERENCE BOOKS**

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	Odum. E.P	Fundamentals of Ecology.	Nataraj Publishers	1996
2.	Trivedi, P.R.and Gurdeepraj, K.	Environmental Biology	Akashdeep Publishing House, New Delhi.	1992
3.	Asthana, D.K. and Asthana, M	Environmental Problems and Solutions.	S. Chand and Co., New Delhi.	2001
4.	Abraham,J.C.B	Evolution (A Laboratory Manual)	Macmillan india Ltd.,Chennai	1987
5.	E.C.Minkoff	Evolutionary Biology	Addison Wesley,London	1984
6.	E.O.Dodson	Evolution	Reinhold,Newyork	1990

**WEB SOURES:**

[www.sciencedaily.com](http://www.sciencedaily.com)

[www.sciencemag.com](http://www.sciencemag.com)

[www.treehugger.com](http://www.treehugger.com)

[www.nature.com](http://www.nature.com)

**TEACHING METHODOLOGY**

- Class room teaching
- Assignments
- Discussions
- Home test
- PPT Presentations
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**SYLLABUS DESIGNERS**

- Dr D.Sasikala, Assistant Professor & HOD
- Dr.V.Kiruthiga, Assistant Professor
- Dr V.Rekha, Assistant Professor
- DrA.Vinodhini, Assistant Professor
- Dr.G.Vidhya, Assistant Professor
- Dr. S. Vijayakumari, Assistant Professor