

EVOLUTION AND DIVERSITY OF LIFE (SELF STUDY)

Semester	Subject Code	Category	Lecture		Theory		P	C
I	POCBT1SS	Self Study	3 hrs per week	45		45	0	2

COURSE OBJECTIVES:

- The course is presented from an evolutionary perspective which focuses on the diversity of life and the similarities found among all living things and provide the tools to critically analyze biological data and intelligently relate these data to issues in our society such as extinction, global warming etc.

COURSE OUTCOME:

CO Number	CO Statement	Knowledge level K1 – K4
CO1	Understand the theories of evolution and behavior	K2
CO2	Analyse the time scale and molecular evolution	K4
CO3	Evaluate brain behaviour and evolution	K4
CO4	Analyse the classification of life forms	K4
CO5	Demonstrate about the habitat types in India and importance of agriculture	K3

Knowledge level: K1- Remember; K2- Understand; K3- Apply; K4- Analyze; K5- Synthesize; K6- Evaluate

MAPPING WITH PROGRAM OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	M	S	M	M	M
CO2	M	M	S	M	M	S
CO3	M	M	S	M	S	S
CO4	M	M	S	M	M	S
CO5	M	S	S	S	S	S

S-strong; M- medium; L-low

UNIT I

Evolution And Behaviour:

10 Hours

Emergence of evolutionary thoughts Lamarck; Darwin—concepts of variation, adaptation, struggle, fitness and natural selection; Mendelism; Spontaneity of mutations; The evolutionary synthesis

Concept of Oparin and Haldane; Experiment of Miller (1953); The first cell; Evolution of prokaryotes; Origin of eukaryotic cells; Evolution of unicellular eukaryotes

UNIT II

Paleontology And Evolutionary History:

15 Hours

The evolutionary time scale; Eras, periods and epoch; Major events in the evolutionary time scale; Origins of unicellular and multi cellular organisms; Major groups of plants and animals; Stages in primate evolution including Homo.

Molecular Evolution: Concepts of neutral evolution, molecular divergence and molecular clocks; Molecular tools in phylogeny, classification and identification; origin of new genes and proteins; Gene duplication and divergence.

UNIT III

Brain, Behavior And Evolution:

10 Hours

Approaches and methods in study of behavior; Proximate and ultimate causation; Altruism and evolution-Group selection, Kin selection, Reciprocal altruism; Neural basis of learning, memory, cognition, sleep and arousal; Biological clocks; Development of behavior; Social communication; Social dominance; Use of space and territoriality; Mating systems, Parental investment and Reproductive success; Parental care; Aggressive behavior; Habitat selection and optimality in foraging; Migration, orientation and navigation; Domestication and behavioral changes.

UNIT IV

Diversity of Life Forms:

10 Hours

Principles & methods of taxonomy: Concepts of species and hierarchical taxa, biological nomenclature, classical & quantitative methods of taxonomy of plants, animals and microorganisms.

Outline classification of plants, animals & microorganisms: Important criteria used for classification in each taxon. Classification of plants, animals and microorganisms. Evolutionary relationships among taxa.

UNIT V

Natural History of Indian Subcontinent:

10 Hours

Major habitat types of the subcontinent, geographic origins and migrations of species. Common Indian mammals, birds. Seasonality and phenology of the subcontinent.

Organisms of health & agricultural importance: Common parasites and pathogens of humans, domestic animals and crops. Organisms of conservation concern: Rare, endangered species. Conservation strategies.

TEXT BOOKS:

S.no	Authors	Title	Publishers	Year of publication
1	Robert Brooker	Evolution Diversity and Ecology	McGraw Hill Companies Incorporated	2010
2	Edward O.Wilson	The Diversity of life	W.W Norton and Company	2010

REFERENCE BOOKS:

S.no	Authors	Title	Publisher	Year of publication
1	Mayr Ernst	Evolution and diversity of life	Library of congress – in-publication data	2015
2	Eli C.Minkoff	Evolutionary biology	Addison Wesley Publishing Company	2010

WEB SOURCES:

1. <https://www.ugc.ac.in/oldpdf/modelcurriculum/Chapter4.pdf>
2. <https://www.biodiversitylibrary.org>
3. <https://www.studocu.com/en/document/university-of-calgary/primate-behaviour/lecture-notes/lecture-notes-lecture-9-evolution-and-natural-selection/430446/view>
4. https://www.academia.edu/10084149/Paleontology_Lecture_Notes
5. <https://www.studocu.com/en/document/macewan-university/brain-and-behaviour/lecture-notes/lecture-notes-brain-and-behaviour-chapter-1-7-9-11/723069/view>
6. <https://courses.lumenlearning.com/wm-biology2/chapter/the-diversity-of-life/>

Syllabus Designer:

- Mrs. S. Akhila
Assistant Professor