CURRICULUM PLAN (Aug. -Dec., 2025)

Dr. MAYANGLAMBAM ROJINA DEVI

Subject- **Evolutionary Ecology (DSC 15; Theory)**
Class- **B. Sc. Life Science Sem. V**

Contents	Allocation of lectures	Month-wise schedule to be followed	Tutorial/ Assignments / Presentations
UNIT- 1: Introduction to Evolutionary Ecology 3 hrs Introduction to the concepts of evolution and ecology and the relationship, evolutionary theories and origin of life, Levels of ecological hierarchy, heritability, natural selection, fitness and adaptation; Types of selection, Ecological adaptations of animals to their environment	3 lectures	August	• Overall introduction to this paper • PPT with relevant pictures and videos
UNIT- 2: Population Ecology 7 hrs Group attributes- Density, natality, mortality, dispersal and dispersion, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion. Population growth- Exponential and logistic growth, Life history traits - r and K selection. Population regulation - Density dependent and independent. Population interactions: Positive and negative interactions	7 lectures	August	• 2 minutes recap of previous class • PPT with relevant pictures
UNIT- 3: Community Interactions 6 hrs Characteristics of community- species richness, dominance, diversity and abundance. Community organisation – habitat, niche, guilds, and dominant species. Interspecific interactions with examples. Species diversity indices. Types of ecological succession. Characteristics of climax community, Concept of keystone, flagship, umbrella species with examples.	6 lectures	September	• Discussion through PPT • Surprise quiz • Distribution of assignments
UNIT- 4: Processes of Evolutionary Change and Species Concept Natural selection and its types, Genetic drift, Artificial selection. Species concept, Isolating mechanisms, Modes of speciation (Allopatric, Sympatric, Parapatric and	7 lectures	September	• Discussion through PPT • Surprise quiz

Peripatric), Adaptive radiation/macroevolution (Darwin finches).			
UNIT- 5: Coevolution Introduction to coevolution; types of coevolution (pairwise coevolution, diffuse coevolution, and gene-for-gene coevolution); Co-evolutionary interactions (Coevolution of competitors, Predator-prey coevolution, Host-parasite coevolution, Coevolution of mutualists); Evolutionary equilibria. Approaches to examine coevolution; Co-speciation and diversification.	4 lectures	October	• Lecture • Class test
UNIT- 6: Macroecology Introduction to macroecology: patterns and constraints; macroecological datasets; statistical patterns of abundance, distribution and diversity; Allometry: metabolism, body size and temperature; Macroecology of humans; Conservation macroecology: assessing, prioritizing, and quantifying biodiversity at large scales; Extinction dynamics.	3 lectures	November	• 2 minutes recap of previous class • PPT with relevant pictures • REVISION

Subject- **Evolutionary Ecology (DSC 15; Practical)**
Class**- B. Sc. Life Science Sem. V**
Shared with**- Dr. Kanchan Batra** and **Mr**. **Gulshan Yadav**

Month	**Practical**
August 2025	• Study of Phytoplankton and zooplankton from an aquatic ecosystem • Measurement of temperature, turbidity/penetration of light, determination of pH
	• Determination of Dissolved oxygen content (Winkler's method) from different water samples
	• Determination of Free carbon dioxide and hardness in different water sample
	• Study of life tables and plotting of survivorship curves of different types from hypothetical/ real data

September 2025	• Determination of population density in a natural or a hypothetical community by quadrate method and calculation of Shannon-Weiner diversity index
	• Determination of Chemical oxygen demand from different water samples
	• Determination of chlorides in different water sample
	• Study and verification of Hardy-Weinberg Law by Chi-square analysis
	• Catch, mark and recapture technique for finding the population size.
October 2025	• Lotka-Volterra equation significance in competition; Lotka-Volterra equation, functional and numerical responses in Predation
	• Study of homology, analogy and homoplasy from suitable specimens
	• Gause's Principle with laboratory and field examples
	• Construction of cladograms based on morphological characters
	• A visit to a National Park/Biodiversity Park/Wildlife Sanctuary
November	**REVISION and MOCK PRACTICAL TEST**