

LS 507A Biodiversity and Evolution		2 Credits
Name of the Faculty: Prof. Nirala Ramchary*, Dr. Bhupendra Chaudhary		
Sr.No.	Topic	Faculty Name / Contact Hours
1.	Introduction to biodiversity: germplasm, gene pool, and population biology, Centres of origin and biodiversity hotspots	NR/3
2.	Types of biodiversity: genetic, species and ecosystem diversity; Role of biodiversity in agriculture and industry.	NR/3
3.	Patterns of species distribution: biomes, gradients, island biogeography and species-area relationship, measuring biodiversity	NR/2
4.	Role of biodiversity in ecosystem function and stability; Hypotheses and Theoretical Foundations	BC/2
5.	Perspectives on biodiversity loss, species extinction, indirect & direct drivers: habitat loss, fragmentation, extractive uses, invasive species, endangered species and protection laws.	BC/2
6.	Biodiversity conservation strategies for marine and terrestrial ecosystems, area-based measures, other effective area-based conservation measures (OECMs); Convention on Biological Diversity; Aichi Target 11.	BC/2
7.	Concepts and theories of evolution, evidences in favor of evolution: morphology & comparative anatomy, embryology, paleontology, geographic distribution, taxonomy, connecting links, cytology, biochemistry & physiology, genetics	BC/3
8.	Forces affecting evolution – selections, mutation, insertion/deletion (indels), recombination and gene flow; variation and divergence of populations, natural selection	NR/2
9.	Microevolution and macroevolution: mechanisms and forces; monophyly and polyphyly; anagenesis, cladogenesis, and stasisgenesis; phyletic gradualism and punctuated equilibrium. Mechanisms of speciation: sympatric and allopatric speciation, genetics of speciation.	BC/3
10.	Evolution at genes, proteins, and genome level, Polyploidization, subfunctionalization and neofunctionalization, molecular clock	NR/2 BC/1
11	Recent advances in biodiversity, evolution, and organismal biology in the genomics era	NR/1 BC/1
12.	Field visit to National park/Wildlife Sanctuary/Biodiversity hotspot/Biosphere Reserves of India during the semester to study biodiversity practically.	NR/4 BC/4

Further Reading:

1. Text Book of Biodiversity by K. Krishnamurthy, Publisher: Science Publishers, Inc Post office Box 669, Enfield, New Hampshire, 03784, USA
2. Biodiversity: An Introduction (Second Edition) by Kevin J. Gaston and John I Spicer, Publisher: Blackwell Science Ltd, Blackwell publishing Company
3. Principles of Population Genetics (Fourth edition) by Daniel L. Hartl and Andrew G. Clark, Publisher: Sinauer Associates, Inc.; 4th edition (December 31, 2006)
4. An Introduction to Evolutionary Ecology by Andrew Cockburn, Publisher: Wiley-Blackwell Publisher
5. Evolution: Principles and Processes by Brian K Hall, Publisher: Jones & Bartlett Learning
6. Molecular Evolution and Phylogenetics by Masatoshi Nei and Sudhir Kumar, Publisher: Oxford University Press, USA; 1 edition.