Course contents submitted by Dr. Nirotpal Mrinal

1. **Department:** N/A
2. **Faculty:** FLSB
3. **Course Code:** To be given
4. **Course Title:** Evolution and Biodiversity
5. **Number of Credits:** Two
6. **Course objectives:**

Understanding the basic principles of Darwinian Evolution, population genetics and ecosystems

7. **Minimum prerequisites for taking this course, if any:**

Bachelor-level of Biology.

8. **Course structure with units, if applicable:**

The following topics will be covered as part of Molecular Genetics course:

a) Evolutionary science:
Creationism, Darwin, Lamarck and Weismann

b) RNA world, evolution of genes and genomes:
Evolution of genetic material, RNA, DNA, gene, gene function, plasmids, phage, transposable elements, recombination

c) Molecular evolution:
Phylogeny, tree of life, evolution of eukaryotes and multicellularity, population genetics, Allele frequency, genetic drift

d) Phenotypic evolution:
Evo- Devo, macro-evolution and their mechanism, host pathogen evolution and co- evolution

e) Species and speciation:
Speciation mechanism, relation to natural selection, role of adaptation, genetic variation and evolutionary fitness

f) Evolution above the species level:
Evolution of diversity, evolution of novelty, evolution of sex and sexually dimorphic features

g) Ecology and ecosystems:
Community ecology, behavioral ecology, species interaction, conflict and co-operation, ecosystem dynamics, biodiversity, energy flow, physiological ecology, population ecology.

9. **Reading suggestions:**

a) **Ecology: From individuals to ecosystem**, Begon and Harper, Blackwell publishing
b) **Ecology: Concepts and applications**, Molles, 4th edition, McGraw Hill
c) **Principles of population genetics**, Hartl
d) **Evolution**, Nipam Patel, CSHL press