



| Code     | Subject Title | Cr. Hrs | Semester |
|----------|---------------|---------|----------|
| ZOOL-308 | Evolution     | 2       | V        |
| Year     | Discipline    |         |          |
| 3        | Zoology       |         |          |

Origin of life: Panspermia and Chemical theory; The causes of micro-evolution; Hardy-Weinberg equilibrium, Mutation, Gene flow, Genetic drift, Nonrandom breeding, and natural selection. Types of natural selection, its measurement. Causes of polymorphism in populations. The general selection model: (one locus and two locus), Genetic load, Cost of selection, Hitch-hiking, Linkage disequilibrium and shifting balance theory. Fitness and its measurement, Dependence of fitness on frequency of individual. Concept of phenotypic variation: Polygenic traits and Heritability. Explanation for adaptation, genetics of adaptation, reasons of imperfect adaptation. The Units of selection (allele, cell line, organisms, kin group and group). Sexual selection, Theories of sexual selection; Darwin, Fisher and Zahavi. Macroevolution: Evolutionary developmental biology: allometry, heterochrony, species selection, Evolutionary innovation and origin of higher taxa. Rates of evolution; Evolutionary trends and laws, Gradualism and punctuated equilibrium. Coevolution and co adaptations.

#### Textbook

Ridley, M. 2004. Evolution, 3<sup>rd</sup> edition. Blackwell Science.

#### Additional Readings

1. Bell, G. 1997. Selection: the mechanism of evolution. Chapman & Hall, NY.
2. Dawkins, R. 1986. The blind watchmaker. Longman Scientific and Technical. Essex, England.
3. Dawkins, R. 1978. The selfish gene. Oxford University Press, NY.
4. Freeman, S. and Herron, J. C. 2004. Evolutionary analysis, 3<sup>rd</sup> ed. Pearson Prentice Hall.
5. Futuyma, D. J. 1997. Evolutionary Biology, 3<sup>rd</sup> ed. Sinauer Associates, Inc. Sunderland, Massachusetts.
6. Gould, S. J. 1977. Ever since Darwin. W. W. Norton and Company, NY.
7. Ridley, M. 2000. Genome. New York: Perennial. Great reading.
8. Stearns, S. C. and Hoekstra, R. F. 2000. Evolution, an introduction. Oxford University Press.
9. Strickberger, (3<sup>rd</sup> or latest edition) Evolution. Jones and Barrett Publishers.
10. Freeman Dyson, 1999. Origin of life, Cambridge University Press.