Code	Subject Title	Cr. Hrs	Semester
ZOOL-201	Zoology-III (Biochemistry)	3	III

Year	Discipline
2	Botany, Zoology, Chemistry-I

Monomers and Polymers of life, Amino acids, Peptides and Proteins:
Standard Amino acids, their structure and Classification; Acid/Base properties of amino acids and their Titration curves; Non-standard amino acids, their structure and role; Peptides, Biologically active peptides and polypeptides; Covalent structure of proteins and amino acid sequence; Protein; Three dimensional structure of proteins, Secondary structures of proteins; Tertiary and Quaternary structure of proteins, Globular proteins, Structural and functional diversity in globular proteins; Immunoglobulins their types, structure and functions;
Enzymes: Introduction; Important characteristics of enzymes;
How enzymes work, Enzyme rate of reaction and substrate concentration, How pH and temperature effect enzyme activity; Kinetics of Bisubstrate and Multisubstrate reactions; Enzyme Inhibition, Irreversible and Reversible inhibition; Isozymes; Enzyme precursors and Associates.

Carbohydrates:
Classification, types, important characteristics and structure of Carbohydrates; Disaccharides their types structure and function; Polysaccharides, Storage and Structural types; Structure and major functions of polysaccharides; Glycogen, Starch, Cellulose, Chitin; Homo- and Hetero-polysaccharides; Peptidoglycans of bacterial cell wall.

Lipids:
Fatty acids, their types and major characteristics; Storage Lipids, Acylglycerols; Waxes; Structural Lipids in membranes, Glycerophospholipids, Sphingolipids, their role and degradation; Glycolipids; Isoprenoids, Terpenoids and Sterols; Major functions of Lipids.

ENVIRONMENTAL BIOLOGY & EVOLUTION I:

Environmental Biology:
An overview of concepts of ecosystem with emphasis on interaction and homeostasis. Basic global ecosystems (atmosphere, hydrosphere, lithosphere, ecosphere). Biogeochemical cycle: nitrogen, phosphorus, sulpher, water, carbon. Limiting factors: basic concepts, temperature, soil, water and humidity, light, fire. Energy: laws of thermodynamics, primary and secondary productions, trophic levels and energy variation with increasing trophic levels, energy flow, food chains and food webs. Population ecology: basic population characters, growth and growth curves, population dynamics and regulations.

Evolution:
The nature and origin to life. Evidences of evolution. (molecular, embryological & paleontological). Factors initiating elementary evolutionary changes (micro-evolution) by changing gene frequencies, mutation pressure, selection pressure, immigration and crossbreeding, genetic drift.

Books Recommended:

1. David L. Nelson, and Michael M. Cox, 2005. Lehninger Principles of Biochemistry, 4th Edition, Macmillan Worth Publishers, New York.
2. Lubert Stryer, 1995. Biochemistry, 4th Edition, W.H. Freeman & Company, New York.

3. Murray, R. K., Granner, D. K., Mayer, P. A. and Rodwells, V. W., 2000. Harper's Biochemistry, McGraw Hill Bok Company, New York.
4. Elliott, W. H. and Elliot, D. C., 2002. Biochemistry and Molecular Biology, Oxford Medical Publications, Oxford University Press.
5. Voet, D., Voet, J. G. and Pratt, C. W., 1999. Biochemistry, John Wiley & Sons.
6. Odum, E. P. 1994. Fundamentals of Ecology. W.B. Saunders.
7. Molles, M.C. Ecology: Concepts and applications McGraw Hill, Boston
8. Dondson, S.I., Allen, T.F.N., Carpenter, S.R., Ives, A., Jeanne, R.L., Kitchell, J.F.,
9. Langston, N.E. and Turner, M.G., 1998. Ecology. Oxford Univ. Press, Oxford.
10. Singby, D. and Cork, D., 1986. Practical Ecology. McMillan Education Ltd. London.
11. Chapman, J.L. and Reiss, M.J.1997. Ecology. Principles and Application. Cambridge Univ. Press, Cambridge.
12. Smith, R.L. 1980. Ecology and Field Biology, Harper and Row.
13. Ridley, M., 1993. Evolution. Blackwell Scientific Publications.
14. Dobzhansky, T., Ayala, F.J., Stebbins, G.L. and Valentine, J.W., 1973. Evolution. W.H. Freeman and Company.
15. Dobzhansky, T. Genetics and the Origin of Species, Columbia University Press, New York.
16. Mayr, E. Populations, Species and Evolution, Harvard University Press.
17. Moody, P.A., 1989. Introduction to Evolution, Harper and Row Publishers, New York.
18. Strickberger. (2000). Evolution. Jones & Barrett Publishers