Gen 2003	NATURAL SCIENCE (Chemistry)	(CR3)
Preq.	FSc/A-Level or equivalent	

Objectives
To make students understand basic principles of science of chemistry.

Syllabus
Atomic structure, Periodic table and Atomic properties, Types of Chemical Bonding Gaseous and Liquid states of matter, Nature of covalent bond, Lewis structure, bond length, bond angles and bond energies, localized and delocalized bonding resonance valence bond theory and molecular orbital concepts, hybridizations, Sp3, Sp2, and Sp orbital, dipole moments, inductive and resonance effects, rules for relative contribution from different resonance structures, Modern concepts using mathematics for understanding the principles, Fundamental laws, Atomic molecular structure, states of matter, Equilibrium, Kinetic and elementary inorganic, organic and nuclear chemistry, physical chemistry.

Recommended Books

1. *Chemistry: the central science, by T. E. Brown et. al. Pearson, (2017)*
2. *Chemistry, by S. S. Zumdahl and S. A. Zumdahl, Cengage, (2017)*
3. *Chemistry: structure and properties, by N. J. Tro, Pearson, (2017)*

OR

Gen 2004	NATURAL SCIENCE (Biology)	(CR3)
Preq.	FSc/A-Level or equivalent	

Objectives
To give students an introduction to basic concepts of modern biology.

Syllabus
Life and second law of thermodynamics, natural history of cell, life and periodic table, water and life, small molecules of the living machine, Nucleic acids, proteins, enzyme catalysis, metabolic pathways, mitochondrion, nucleus and the storage and transmission of information, ribosomes, ground substances and conversion of chemical energy into work, membrane system, development and control of cell structure and function. Structure and duplication of genetic material, chromosome duplication and division, segregation of genes, independent assortment, sex-linked inheritance, linkage and recombination of genes, cytoplasm in heredity, transmission of genetic material in bacteria and bacterial virus, mutation gene action and synthesis of proteins, genetic units of recombination, mutation and function.

Recommended Books

1. Biology: the core, by E. J. Simon, Pearson, (2016)
2. Campbell Biology, by L. A. Urry and M. L. Cain, Pearson, (2016)