**Biology**

**1.The Living World**   
--Classification   
--Levels of organization

**2.Cell Biology**   
--Chemical Components of a Cell   
--Elements and inorganic compounds   
--Lipids, carbohydrates, proteins and nucleic acids colloidal systems   
--Cellular Metabolism   
--Enzymes   
--Energy production in glycolysis, Krebs cycle and terminal oxidation Photosynthesizes   
--The biosynthesis of lipids, carbohydrates, proteins and nucleic acids   
--Cellular Ultrastructure (Organelles), Cellular physiology, Membrane transport   
--Endocytosis and exostosis   
--The action potential cellular movements

**3.Organic Biology**   
--Nutrition   
--Respiration   
--Excretion   
--Circulation Locomotion   
--Reproduction   
--Sexual an asexual reproduction growth and development   
--Regulation   
--Homeostasis and regulation by hormones   
--Nervous regulation   
--The nervous system   
--The synapse and neurotransmitters   
--Autonomic nervous system   
--The spinal cord   
--The brain   
--Memory and sleep   
--Perception   
--Receptors and perceptive organs   
--The evolution of the systems listed above   
--Structure and function of the corresponding human-organs   
--Animal behavior   
--Innate and learned behavior

**4.The Environment**--Ecology, ecosystems   
--Food chains, limiting factors, cycles in nature   
--Populations and communities

**5.Genetics**--Molecular genetics   
--Properties of the genetic material   
--Mutation, recombination   
--The genetic code   
--The operon   
--Classical genetics   
--Modes of inheritance (discontinuous traits)   
--Linkage   
--Sex chromosomes

**6.Evolution**   
--Population genetics   
--Chemical and biological evolution   
--Human evolution

**Chemistry**

###### 1. General Chemistry  --Atomic theory. Classification of matter. Elements and compounds

###### --Basic terms: atomic and mass numbers, isotopes, the mole concept, atomic and molar masses  --Basic structure of atoms. Electronic structure of atoms: quantum numbers and atomic orbitals

###### --The periodic table. Periodic properties

###### --Chemical bonding: ionic, covalent and metallic bonding

###### --Intermolecular forces

###### --Naming of molecular and ionic substances  --States of matter; changes of state. Properties of

###### gases and liquids  --Properties of solids. Types of crystal lattice

###### --Lewis structures. Geometry of molecules

###### --Solutions, solubility. Ways of expressing concentration

###### --Chemical reactions: types of inorganic chemical reactions. Stoichiometry

###### --Chemical reactions: rate of chemical reactions. Catalysts

###### --Thermochemistry. Heat of chemical reactions. Hess's law

###### --Chemical equilibrium. Law of mass action  --Acids and bases. The pH

###### --Electrochemistry: electrode potential, electrochemical cells  --Electrolysis

###### 2. Inorganic Chemistry  --Non-metals  --Metals  --d-Block elements

###### 3. Organic Chemistry  --Properties of carbon. Functional groups. Types of organic chemical reactions  --Alkanes. Alkyl groups  --Alkenes and alkynes  --Aromatic hydrocarbons --Alkyl halides  --Alcohols  --Ethers and phenols  --Aldehydes and ketones  --Carboxylic acids. Substituted carboxylic acids  --Amines  --Heterocyclic compounds  --Stereochemistry. Isomerism. Optical activity  --Carbohydrates. Conformation of monosaccharides  --Monosaccharides, disaccharides and oligosaccharides  --Amino acids, peptides and proteins  --Carboxylic acid derivatives. Lipids  --Nucleic acids

**--Continuous traits genetic counselling**

**6.Evolution   
--Population genetics   
--Chemical and biological evolution   
--Human evolution**