



Basics of Chemistry

Unit I

15 h

Some Basic Concepts of Chemistry:

Importance and scope of Chemistry, atomic number, molecular masses and valency, molecular formula, Chemical equation, types of chemical reactions, oxidation and reduction, Acids and bases (Their definitions in terms of furnishing of H^+ and OH^- ions, General properties, examples and uses), concept of pH scale (Definition relating to logarithm not required), importance of pH in everyday life;

Unit II

15 h

Elements, Metals and Non-Metals

Basic structure of atom, Periodic classification of elements, modern periodic law and the present form of periodic table, Metals and non-metals (Physical and Chemical Properties), Idea of Nobel gases, Radioactivity and radioactive elements, Deficiency diseases of Fe, Cu, Zn and Mn, toxicity of As and Hg.

Unit III

15 h

Carbon compounds:

Covalent bonding in carbon compounds. Versatile nature of carbon, difference between saturated hydro carbons and unsaturated hydrocarbons. Chemical properties of carbon compounds (combustion, oxidation, addition and substitution reaction). Some carbon compound used in industry and daily life (vinegar (Acetic acid), benzoic acid, benzene, methane, Graphite, Alcohol, Hand sanitizer), Common Fuels (LPG, Petrol and Diesel).



Unit IV

15 h

Chemistry and Environmental Monitoring

Layers of atmosphere, Pollution and its types (Air, Water, Soil, radioactive and microplastic), Green House effect, Global warming, acid rain and Ozone layer depletion. Air Quality parameters (PM 2.5, PM 10, SO₂, SO₃, NO₂, NO₃, Ozone) and air quality index, Drinking water quality parameters (TDS, pH, DO, Turbidity, Fluoride and their permissible range. Noise quality (permissible limit of noise level in various zones (industrial, residential) with reference to Indian standards.



(4 Credit)

Elective Course

Chemistry in Everyday Life

Unit 1 General Chemistry: Chemicals in our life, Chemical symbols and composition, Organic and Inorganic chemicals, Uses of some common chemicals: Alum, Bleaching Powder, Caustic Soda, Baking Soda, Washing Soda, Sulphuric acid and Vinegar.

Unit 2 Chemistry in Biology: Minerals, Vitamins, hormones, enzymes, nucleic acid, oil and fat, food adulteration, additives and preservatives, common class of drugs: Analgesic, antipyretic, antibiotic, antiviral, antidiabetic: artificial sweetener; antimalarial, antifungal, antimicrobial, germicide and antiseptic.

Unit 3 Material Chemistry: Paints, Enamels, Lubricants, gels, Glass, Polymers, cement and plaster of Paris, soap and detergents, dyes, nanoparticles and nanotubes, Antifreeze, anticoagulant.

Unit 4 Chemistry in Agriculture: Composition of soil, Introduction to fertilizers, Common fertilizers like DAP, NPK, Urea, vermicompost, Common herbicides and insecticides, impact of agrochemicals on environment.