

CHN – 604 (D) Environmental Chemistry

CH-503 Environmental Chemistry

60 Hrs (2 Hrs/week)

- I Environment 8 Hrs**
Introduction. Composition of atmosphere, vertical temperature, heat budget of the earth atmospheric system, vertical stability atmosphere. Biogeochemical cycles of C, N, P, S and O. Biodistribution of elements.
- II Hydrosphere 12 Hrs**
Chemical composition of water bodies-lakes, streams, rivers and wet lands etc. Hydrological cycle.
Aquatic pollution – inorganic, organic, pesticide, agricultural, industrial and sewage, detergents, oil spills and oil pollutants. Water quality parameters – dissolved oxygen, biochemical oxygen demand, solids, metals, content of chloride, sulphate, phosphate, nitrate and micro-organisms. Water quality standards.
Analytical methods for measuring BOD, DO, COD, F, Oils, metals (As, Cd, Cr, Hg, Pb, Se etc.), residual chloride and chlorine demand.
Purification and treatment of water.
- III Soils 6 Hrs**
Composition, micro and macro nutrients, Pollution – fertilizers, pesticides, plastics and metals. Waste treatment.
- IV Atmosphere 8 Hrs**
Chemical composition of atmosphere – particles, ions and radicals and their formation.
Chemical and photochemical reactions in atmosphere, smog formation, oxides of N, C, S, O and their effect, pollution by chemicals, petroleum, minerals, chlorofluorohydrocarbons. Green house effect, acid rain, air pollution controls and their chemistry.
Analytical methods for measuring air pollutants. Continuous monitoring instruments.
- V Industrial Pollution 12 Hrs**
Cement, sugar, distillery, drug, paper and pulp, thermal power plants, nuclear power plants, metallurgy. Polymers, drugs etc. Radionuclide analysis. Disposal of wastes and their management.
- VI Environmental Toxicology 14 Hrs**
Chemical solutions to environmental problems, biodegradability, principles of decomposition, better industrial processes.

Bhopal gas tragedy, Chernobyl, Three mile island, Sewozo and Minamata disasters.

Books Suggested

Environmental Chemistry, S. E. Manahan, Lewis Publishers.

Environmental Chemistry, Sharma & Kaur, Krishna Publishers.

Environmental Chemistry, A. K. De, Wiley Eastern.

Environmental Pollution Analysis, S.M. Khopkar, Wiley Eastern

Standard Method of Chemical Analysis, F.J. Welcher Vol. III, Van Nostrand Reinhold Co.

Environmental Toxicology, Ed. J. Rose, Gordon and Breach Science Publication.

Elemental Analysis of Airborne Particles, Ed. S. Landsberger and M. Creatchman, Gordon and Breach Science Publication.

Environmental Chemistry, C. Baird, W. H. Freeman.