

507. ENVIRONMENTAL SCIENCE

Atmosphere composition and structure- green house gases and its effect-global warming and consequences. Ozone layer and depletion. photochemical reactions. Soil composition and formation. soil erosion and conservation. hydrological cycles. Thermal stratification in lakes. Biogeochemical cycles. Eutrophication and Restoration of lakes.

Effect of air pollution on plants, humans, material damage. Various types of plumes, wind rose dispersion of air pollutants. Dispersion models. The Gaussian plume model. Ambient air sampling methods for collection and analysis of SPM and RSPM,SO₂,NO_x. Air pollution control methods. Automobile pollution control.

Principles and application of Flame Photometer and atomic absorption spectrophotometer. Classification and principle of chromatography of TLC, GC, HPLC, Electrophoresis – Theory and applications. Microscopy Phase-contrast microscope and scanning electron microscope and scanning electron microscope principles and application.

Culturing of Micro-organisms –culture media, isolation of pure culture. The influence of environmental factors on growth of micro-organisms. Control of micro organisms by physical and chemical agents.

Precipitation process, forms and types. Major climatic regions of the world. Classification of climates – Koppen's.

Development and Evolution of Ecosystems. Patterns types of succession. Concept of climax. Climax theory. Positive and negative interaction of populations community characters. Community interactions including prey predator relationships. Biomass utilization. Methods of measurement of biomass and productivity.

Effect of heavy metals on plants and animals. Biological treatment methods of waste water (secondary treatment)-waste stabilization ponds, aerated lagoons. Activated sludge, trickling filter. Sludge disposal. Advanced waste water treatment . characteristics and methodology for the treatment of industrial waste water. Reuse and recycle of waste water. Removal of suspended solids. Dissolved solids, Nitrogen, phosphorous, Reuse and recycle of waste water. Flow diagrams for the treatment methods of sugar, distillery and tannery industries.

Rain water harvesting and watershed management.

Environmental impact of mining of ground water. Solid waste disposal and management. Radioactive waste management. Large dams and environmental problems. Hazardous chemicals – storage, safe keeping. Industrial fires and their on environment . safety and accreditations OHSAS 180001.

Bio diversity – Threats to biodiversity, Endemic and endangered species, hot spots of biodiversity, conservation of biodiversity.

Drinking water quality standards – BIS 0500 CPHEEO WHO guidelines. Conventional water treatment methods. Specific water treatment methods. Biomedical waste management.

Principles of remote sensing. Advantages and limitations of visual and digital interpretation for environmental studies. Applications of remote sensing to Urban landscape mapping, vegetation, land scape ecology. Remote sensing for flood mapping, flood damage assessment and drought assessment. Application of GIS for Environmental studies GPS applications for environmental studies interface of GPS data with GIS.

Phyto-remediation, Rhizo-deposition and their role in Rhizo-degradation Immobilization of cells and enzymes. Methods of immobilization and application.

Bio-concentration and Bio-magnification of toxicants. TLC techniques for determination of toxicants in water and vegetables samples. Chemical classification and mode of action of pesticides. Factors effecting metabolism of xenobiotics. Natural resources. Depletion and conservation.

EIA-Environmental Assessment guidelines. Various categories of EIA. EIA Notification of 1994. Identification of impact. Prediction and evaluation of impact. Environmental management plants (EMP). Role of Remote sensing and GIS in EIA studies. Environmental Audit. Designing and implementation of Audit Programmes. Environmental Audit report of MOEF format. – From V. Environmental laws. Water and Air Act. Environmental Protection Act 1986.