ENVIRONMENTAL SCIENCE

PH. 3.10 THEORY **3 hours/week**

UNIT – I

Ecological Concepts and Natural Resources: Ecological perspective and value of environment. Environmental auditing, biotic components, Ecosystem Process: Energy, Food Chain, Water cycle, Air cycle etc.

Chemistry and Microbiology in Environmental Engineering: Physical and chemical properties of water, Atmospheric chemistry, Soil chemistry, Microbiology, Chemical and biochemical reactions.

Concept in Hydrology : Hydrological cycle, Water balance, Energy budget, Precipitation, Infiltration, evaporation and evapotranspiration, Rainfall-runoff relationships, Urban hydrology, Ground water, Ground water chemistry.

UNIT – II

Water Pollution: water quality standards and parameters, Assessment of water quality, Transformation process in water bodies, Oxygen transfer by water bodies, Turbulent mixing, Water quality in lakes and preservers, Ground water quality.

Water Treatment: Water quality standards, Water sources and their quality, Water treatment processes, Pre-treatment of water, Conventional process, Advanced water treatment process.

Waste Water Treatment: Water flow rate and characteristics, Design of waste water network, Waste water treatment process, pretreatment, primary and secondary treatment of waste water, Activated sludge treatment: Anaerobic digestion and its application.

UNIT – III

Solid Waste Management

Sources classification and composition of MSW ; properties and separation, storage and transportation, MSW Management, Waste minimization, Reuse and recycling, Biological treatment, Thermal treatment, Landfill, Integrated waste management.

Hazardous Waste Management, Hazardous waste and their generation, Medical hazardous waste. Household waste, Transportation and treatment of hazardous waste: incinerators, Inorganic waste treatment, Treatment systems for hazardous waste, handling of treatment plant residue.

Industrial Air Emission Control:

Air Pollution: Air pollution and pollutants, criteria pollutants, Acid deposition, Global climate change - green house gases, non-criteria pollutants, emission standard from industrial sources, air pollution metereology, Atmospheric dispersion.

Noise Pollution : Physical Properties of sound, Noise criteria, Noise Standards, Noise measurement, Noise control.

UNIT – IV

Waste Minimization: Concept, Life Cycle Assessment, Elements of waste minimization strategy, benefits of waste minimization, Elements of waste minimization programme, Waste reduction techniques.

Environment Impact Assessment, Origin and procedure of EIA, Project Screening of EIA, Scope studies, Preparation and review of EIS.

RECOMMENDED BOOKS:

1. Environmental Engineering Irwin/McGraw Hill International Edition, 1997 , G. Kiely,
2. Principles of Environmental Engineering and Sciences, K.L. Davis and S.J. Masen, McGraw Hill International Edition, 2004.
3. Principles of Environmental Science inquiring & applications, Cunningham & Cunningham (TMH, New Delhi)
4. Introduction to Environmental Science, Y. Anjaneyalu, B.S. Publication. Hyderabad