B. Tech Environmental Science Syllabus Revision – 2022

Environmental Science
Subject Code: CH10102A (with effect from August 2022)

Credit: 0 **Contact hours:** 2 hrs/week

Objective: The course exposes students to various types of environmental problems, their mitigation and prevention. It aims to generate awareness and active participation in environment related issues in workplace and society.

Course Outcome:
CO1: General understanding of environmental degradation and the underlying reasons.
CO2: Basic knowledge about physical components like atmosphere, hydrosphere and Lithosphere.
CO3: General understanding about structure and functions of ecosystem.
CO4: Measurement of Biochemical Oxygen Demand and Understand the relationship between air pollutants and meteorology.
CO5: General idea of global environmental issues.

Module I

Fundamentals of Environmental Science (4 hrs):
Current environmental issues, socio-economic reasons behind degradation of environment, Environmental Science as an interdisciplinary subject, Difference between Environmental Science and Ecology. (2 hrs), Unique features of earth and types of natural resources (1hr.), Tragedy of commons & Ecological Footprint (1 hr.)

Module II

Atmosphere, Lithosphere and Hydrosphere (6 hrs):
Lithosphere and Aesthenosphere. Physico-chemical properties of crust, mantle and core, theory of plate tectonics (1 hr)
Types of rocks – igneous, sedimentary and metamorphic. (1 hr)
Polarity of water, unique properties of water. (1hr), importance of hydrogen bond in biomolecules, amphipathic substances, composition & characteristics of sea & river water. (1hr)
Atmospheric composition (1 hr), Layers of atmosphere. (1hr)

Module III

Ecology (3 hrs):
Components and functions of Ecosystem. (1 hrs), Cybernetics in ecosystem (1 hr)
Analysis of Technoecosytem as case study (1 hr)

Module IV

Biochemical Oxygen Demand (5 hrs):

Carbonaceous BOD test. (1 hr), BOD numerical (1 hrs)
Air pollution and meteorology (1 hrs):
Mathematical model of dry adiabatic lapse rate (1hr), atmospheric stability and air pollution, radiation inversion (1hr)

Module V

Global Environmental Issue (2 hr):
Simple global temperature model and numerical (1hr), global warming and its impact (1 hr)

Texts Books / Reference Books:

i) Fundamentals of Ecology - Eugene P. Odum & Garry W. Barrett
ii) Environmental Chemistry - A.K. De
iii) Environmental Science & Engineering – J. Glynn. Henry & Gary W. Heinke.
iv) Renewable Energy – Power for a sustainable future – Godfrey Boyle.