

<b>ENVIRONMENTAL SCIENCE</b>	
<b>CHY 311 (A) &amp; CHY 411 (A)</b>	<b>Credits: 3</b>
<b>Instruction: 3 periods &amp; 1 tutorial/week</b>	<b>Sessional marks: 40</b>
<b>End exam: 3 Hours</b>	<b>End exam marks: 60</b>

**Target group: Open Elective for Lateral Entry Students of all branches**

**Course Objectives**

- To gain knowledge on the importance of environment and ecosystems.
- To acquire knowledge with respect to biodiversity, its threats and its conservation and appreciate the concept of interdependence.
- To acquire knowledge about environmental pollution- sources, effects and control measures of environmental pollution
- To understand the treatment of wastewater and solid waste management.
- To be aware of the national and international concern for environment for protecting the environment

**Course Outcomes**

By the end of the semester, the student will be able to:	
CO-1	Identify the characteristics of various natural resources and can implement the conservation practices
CO-2	Realize the importance of Ecosystem and Biodiversity for maintaining ecological balance
CO-3	Classify, analyze various pollutants and can develop methods for solving problems related to environment
CO-4	Design and evaluate strategies and methods for sustainable development of environmental systems and for the remediation or restoration of degraded environments
CO-5	Get awareness on various environmental laws and regulations applicable to global issues and play a role in solving social problems

**SYLLABUS**

**UNIT I**

**INTRODUCTION TO ENVIRONMENT AND NATURAL RESOURCES**      10 Periods  
 Introduction: Definition, Multidisciplinary nature, Scope and Importance of Environmental Sciences- R & D in environment, green advocacy, green marketing, green media and environment consultancy. Need for public awareness.

Natural Resources: Forest resources-use and overexploitation, deforestation, Big Dams effects on forests and tribal people. Water resources-sources, use and over utilization of surface and ground water, conflicts over water, dams-benefits and problems. Food resources-environmental impact of modern agriculture-fertilizer and pesticides. Land resources-land degradation- landslides, soil erosion and desertification. Energy resources- renewable and non-renewable energy resources and use of alternate-energy sources.

## **UNIT- II**

### **ECOSYSTEM & BIO DIVERSITY**

10 Periods

Ecosystem: Concept of an ecosystem-structure and function of an ecosystem Food chains, food webs and ecological pyramids, Energy flow in an ecosystem, Ecosystem regulation, Ecological succession. Types, characteristic features, structure and function of forest, grass land, desert and aquatic ecosystems.

Biodiversity-definition, types, India as a Mega diversity Nation, Values of biodiversity, Hot spots of biodiversity, Threats to biodiversity-habitat loss, poaching, human-wildlife conflicts, Endangered and endemic species, Conservation of biodiversity.

## **UNIT -III**

### **ENVIRONMENTAL POLLUTION AND WASTE MANAGEMENT**

10 Periods

Sources, effects and control measures of Air pollution, Noise Pollution, Soil Pollution, Marine pollution, Thermal pollution, Radio Active Pollution. Water Pollution (Sources, Effects, Control measures, DO, BOD, COD, sewage treatment), Green house effect, Ozone depletion, Acid rain –causes and adverse effects.

Solid waste management: Sources and effects of municipal waste, bio-medical waste, Industrial waste, e-waste, Process of waste management-composting, sanitary landfills, incineration.

## **UNIT- IV**

### **SOCIAL ISSUES AND ENVIRONMENT**

8 Periods

Social Issues and the Environment: From unsustainable to sustainable development, Environmental Impact Assessment, Water conservation, Rain water harvesting, water shed management. Resettlement and rehabilitation of people, Environmental ethics.

Urbanization, Industrialization, Transportation, Human population and the environment-population growth, role of information technology in environment and human health.

## **UNIT- V**

### **LEGISLATIONS, CONVENTIONS & CASE STUDIES**

10 Periods

Environmental protection act-Air (prevention and control of pollution) act, Water (prevention and control of pollution) act, Wildlife protection act, Forest conservation act.

International Conventions: Stockholm Conference, Brundtland Commission, Rio declaration, Vienna Convention, Kyoto protocol, Johannesburg Summit.

Case Studies: Chipko Movement, Kolleru Lake, Fluorosis, Silent valley project, Narmada Bacho Andolan, Ralegaon siddhi, Tehri dam, Madhura refinery and Tajmahal

### **Prescribed Book**

Principles of Environmental Studies by Anubha Kaushik & C.P.Kaushik, New Age International Publications.

### **Reference Books**

1. B.K. Sharma, "Environmental chemistry" Goel publishing house, Meerut, 2001.
2. G. S. Sodhi, Fundamental concepts of environmental chemistry, Narosa publishing house, New Delhi
3. S .S.Dara, " A text book of environmental chemistry and pollution control, S.Chand and Company Ltd, New Delhi, 2002.