Course Name Basic Environment & Elementary Biology

Course Code CH(EE)401

Course Credit 2

Contact Hour 2L

Prerequisite Mathematics, C Programming

Course Objective

The objectives of this course are

1. Apply the knowledge of fundamental chemistry for identification, solution and analysis of complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
2. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
3. Function in multi/inter-disciplinary teams with a spirit of tolerance, patience and understanding so necessary for team work;
4. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcome

On completion of the course students will be able to

1. Describe the structure and function of environment and different types of environmental pollution.
2. Identify the types and use of different types of natural resources.
3. Demonstrate environmental problems like global warming, acid rain etc. from the given list.
4. Demonstrate the controlling method of environmental pollution
5. Apply the method of synthesis of green chemistry
6. Perform team work in a project

CO Mapping with departmental POs

H: High, M: Medium, L: Low

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	H	M				H	H	H	H	H	M	M
CO 2	H	M							H	H	H	M
CO 3						H	H		M		H	H
CO 4						H	H		H	H	H	H
CO 5						H	H	H		H		H
CO 6								H	H	H	H	H

Course Content

Module I: General **5L**

Definition, Scope & Importance, Need For Public Awareness- Environment definition, Eco system – Balanced ecosystem, Material cycles- oxygen, Carbon, Nitrogen and Sulphur Cycles. Human activities – Food, Shelter, Economic and social Security. Man, Society and Environment.

Module II: Natural Resources

Water resources: Availability and Quality aspects. Water borne diseases, Water induced diseases, Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Rain water harvesting, **3L**

Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. **1L**

Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Mineral resources : Use and exploitation, environmental effects of extracting and mineral resources. **1L**

Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. **2L**

Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources Different types of energy, Electro-magnetic radiation. Conventional and Non-Conventional sources – Hydro Electric, Fossil Fuel based, Nuclear, Solar, Biomass and Bio-gas. Hydrogen as an alternative source of Energy in future. **2L**

Module III: Pollution

Population Growth (Exponential & Logistic growth model) and Urbanization **2L**

Environmental Pollution and their effects (Previous disaster) **1L**

AirPollution (Atmospheric structure, Primary and Secondary pollutant, Global Temperature model, Green house effect and Global warming, Acid Rain, Ozone Layer depletion, Smog, Control measure) Lapse rate, Atmospheric stability. **4L**

Water pollution (Effects of heavy metals, Sewage, BOD, COD, Water treatment). **3L**

Land pollution and Solid waste management. Noise pollution, e-Waste, Radiation Hazard. **4L**

Module IV: Environmental Management

Objectives, components, Environmental Impact Assessment-basic elements, design. Environmental Audit for sustainable development. **2L**

Green chemistry:

Introduction, Goals Significance, Basic ideas in the field of green chemistry research. Industrial applications of green chemistry. **2L**

Text Books:

1. Basic Environmental Engineering and Elementary Biology: Gourkrishna Dasmohapatra
2. A textbook of Environmental Chemistry and Pollution Control: Dr. S.S. Dara & Dr. D.D. Mishra

Reference Books:

1. Garg, S.K and Garg, R., Ecological and Environmental Studies, Khanna Publishers, Delhi, 2012.
2. Henry J.G. and Heinke G.W., Environmental Science and Engineering, 2nd Edition, Prentice Hall of India, New Delhi, 2004.
3. Masters G.M., Introduction to Environmental Engineering and Science, 2nd Edition, Prentice Hall of India, New Delhi, 2004.