

Devi Ahilya University, Indore, India Institute of Engineering & Technology			IV Year B.E. (Electronics &Instrumentation Engg.)				
Subject Code & Name	Instructions Hours per Week			Credits			
EIR8E5 Environmental sustainability & resource management	L	T	P	L	T	P	Total
	3	1	2	3	1	1	5
Duration of Theory Paper: 3 Hours							

COURSE OBJECTIVES:

Students will be able to

1. Recall the importance of environment and its related issues.
2. Discuss about biogeochemical cycles and biodiversity.
3. Predict threats to the flora and fauna of biodiversity.
4. Evaluate environmental impact, its prediction methods.
5. Create awareness towards global environmental issues, population growth, and use of energy resources, sustainability and waste management.

COURSE CONTENTS

UNIT-I: Ecosystems

Introduction to Environmental Studies. Concept of ecosystem: Introduction, Types of ecosystems- forest and aquatic ecosystems-lentic (pond), lotic (river) and estuaries, Structure-Biotic (Producers, Consumers and Decomposers) and Abiotic, Functions-energy flow in an ecosystem, Food chain- significance (bio magnification- pest and pest control-case study-DDT, Arsenicosis Disease), Food web, Ecological Pyramids-Pyramids of Energy, pyramid of number and pyramid of biomass, Bio-Geochemical Cycles- Hydrological Cycle, Carbon Cycle, Nitrogen Cycle, Evolution in the ecosystem: Ecological succession-xerosere andhydrosere.

UNIT-II: Biodiversity and Its Conservation

Definition, types, values-productive use, consumptive value, social value, ethical value, aesthetic value and option value, biodiversity Vs bio productivity, biodiversity Vs biotechnology, threats to biodiversity: Habitat loss, poaching of wildlife, Invasive species (Exotic), list of endangered and endemic species, Conservation of biodiversity- In situ and Ex situ with examples.

UNIT-III: Renewable Energy

Energy resources-Growing energy needs, Renewable-Solar energy, hydroelectric power, wind energy, bio-energy (bio-ethanol, methane, hydrogen), tidal energy and geothermal energy.

Sustainable development

Concept, threats to sustainability, strategies for achieving sustainability, green building concept.

Population growth and Its Consequences

Health Consequences, Population growth in rich and poor Nations–Their problems and demographic transition.

UNIT-IV: Pollution

Pollution-Introduction, Types- air and water – causes, effects and control measures-Air pollution sampling techniques, waste water treatment-aerobic and anaerobic(treatment of sludge process-composting pasteurization), alternate treatment systems, septic system, composting, septic system.

Global Environmental Issues

Urban environmental problems, Global warming (Climate change- Carbon sequestrationPlants,

soil and oceans, green house gases), Acid rain, Ozone layer depletion and Bio fuels

Vs Food crisis, Fukushima Daiichi nuclear disaster, Ganga action plan, Protocols-Kyoto and Montreal.

UNIT-V: Waste Management

Wealth from the Waste-fly ash, Solid waste treatment methods-Composing, vermincomposting, incineration, pyrolysis, autoclaving, land filling and recycling, collection, handling rules and segregation of municipal solid waste, bio-medical waste and ewaste.

Environmental Impact Assessment (EIA)

Definition, Impact - Classification of impacts (positive and negative), prediction methods of EIA- adhoc and matrix method.

TEXT BOOKS:

1. Richard T. Wright, Dorothy F. Boorse., “Environmental Science”, Towards a sustainable Future12/E, PHI Learning Pvt. Ltd., M97, Ashok Goshal, Connaught circuit, New Delhi.
2. ErachBarucha, “Environmental Studies”, UGC-India, Pune.

REFERENCE BOOKS:

1. Gilbert M. Masters and Ela Wendell P, Introduction to “Environmental Engineering and Science”- LPE Pearson educations.
2. Henry J.G. and Heinke G.W., “Environmental Science and Engineering”, Prentice Hall of India, New Delhi.
3. M. Anji Reddy, “Text book of Environmental Science and Technology”, BS Publications (2010).

4. Benny Joseph, “Environmental Studies”, Tata McGraw Hill, New Delhi (2009).

PRACTICAL:

Field Work:

Local area for documentation on Sustainable development and Population-Health Consequences.

Local polluted site - Urban/ Rural / Industrial/ Agricultural.

Note: Field work - Visit to a local area to document environmental assets/ pollution sites.

COURSE OUTCOMES:

At the end of the course, the students will develop ability to

1. Memorize the concept of environment and its related issues.
2. Paraphrase about components of ecosystem and environment cycles.
3. Compute loss of biodiversity.
4. Categorize the values and conservation of biodiversity.
5. Prioritize energy resources, sustainability, pollution and its types.
6. Estimate global environmental issues and waste management.
7. Recommend solutions to population growth, natural disasters and waste management.
8. Formulate the impacts of environment and its assessment.