

Branch Name:	IMCA
Program Code:	CS301
Course Code	1CS3010707T
Course Title	Environmental Studies
Prerequisite Course:	Basic understanding of science (Biology, Chemistry, Geography) at school level & Awareness of environmental issues and general surroundings

Course Objective:

1. To introduce students to the fundamental concepts of environmental studies, its multidisciplinary nature, and the importance of natural resources.
2. To develop understanding of ecosystems, biodiversity, and their conservation for maintaining ecological balance.
3. To create awareness about environmental pollution, social issues, environmental laws, and sustainable development.
4. To enhance knowledge about human population dynamics, environmental health, and the role of technology and field studies in environmental protection.

Teaching and Examination Scheme:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
4	-	-	4	60	40	-	-	100

Course Contents:

Unit No	Topics	Total Hours	Weightage (%)
1	Multidisciplinary nature of environmental studies Definition, scope, and importance; need for public awareness. Natural Resources: a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams, and their effects on forests and tribal people. b) Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams—benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, and case studies. e) Energy resources : Growing energy needs, renewable and non-renewable energy sources, and use of alternate energy sources. Case studies. f) Land resources : Land as a resource, land degradation, man-induced landslides, soil erosion, and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.	10	25

2	Ecosystems: Concept of an ecosystem, Structure and function of an ecosystem. Producers, consumers, and decomposers. Energy flow in the ecosystem. Ecological succession, food chains, food webs, and ecological pyramids. Introduction, types, characteristic features, structure, and function of the following ecosystem: - a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) Biodiversity and its conservation Introduction—Definition: genetic, species, and ecosystem diversity. Biogeographical classification of India, Value of biodiversity : consumptive use, productive use, social, ethical, aesthetic, and option values ; biodiversity at global, national, and local levels. India as a megadiversity nation V : Hotspots of biodiversity and threats to biodiversity : habitat loss, poaching of wildlife, and man-wildlife conflicts. Endangered and endemic species of India: Conservation of biodiversity : in situ and ex situ conservation of biodiversity.	12	25
3	Environmental Pollution Causes, effects, and control measures of the following: a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution, noise pollution, Thermal pollution g. Nuclear hazards, Solid Waste Management : Causes, effects, and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies: disaster management: floods, earthquakes, cyclones, and landslides. Social Issues and the Environment From unsustainable to sustainable development, urban problems related to energy, water conservation, rainwater harvesting, watershed management, and resettlement and rehabilitation of people are its problems and concerns. Case studies, environmental ethics : issues and possible solutions, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents, and the Holocaust. Case studies, wasteland reclamation, consumerism and waste products, the Environment Protection Act, and the Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act, Issues Involved in Enforcement of Environmental Legislation, Public Awareness.	12	25
4	Human Population and the Environment Population growth and variation among nations. Population explosion – Family Welfare Programme, environment, and human health. Human Rights, Value Education, HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and Human Health. Case Studies. Field work Visit to a local area to document environmental assets (river/forest/grassland/hill/mountain). Visit to a local polluted site—urban/rural/industrial/agricultural: Study of common plants, insects, and birds. Study of simple ecosystems—pond, river, hill slopes, etc. Fieldwork Equal to 5 lecture hours)	11	25

Text Books:

Textbook for Environmental Studies For Courses of all Branches of Higher Education Erach Bharucha for University Grants Commission

Reference Books:

- a) Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- b) Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India, Email:mapin@icenet.net (R)
- c) Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- d) Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
- e) Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumabai, 1196p
- f) De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- g) Down to Earth, Centre for Science and Environment (R)
- h) Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
- i) Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- j) Heywood, V.H & Waston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.
- k) Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.
- l) Mckinney, M.L. & School, R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition. 639p.
- m) Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
- n) Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
- o) Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
- p) Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.
- q) Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
- r) Survey of the Environment, The Hindu (M)
- s) Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science (TB)

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Explain the multidisciplinary nature, scope, and importance of environmental studies, and analyze the use and conservation of natural resources.	L2 – Understand
CLO2	Describe ecosystem structure and function, and examine biodiversity concepts along with conservation strategies.	L4 – Analyze
CLO3	Analyze causes, effects, and control measures of environmental pollution and evaluate environmental issues and policies.	L5 – Evaluate
CLO4	Assess the relationship between human population, environment, and health, and apply knowledge through field-based environmental studies.	L3 – Apply

Course Learning Outcomes	Program Outcomes(POs)												Program Specific Outcomes (PSOs)	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CLO1	L	M	L	L	-	M	M	-	L	H	L	-	-	M
CLO2	L	M	L	M	-	L	M	-	L	H	L	-	-	M
CLO3	-	M	L	M	-	H	M	-	L	H	L	-	-	M
CLO4	-	M	L	H	M	M	M	L	M	H	H	L	L	M

H:High, M:Medium, L:Low