

ENVIRONMENTAL STUDIES

Programme Structure

Course Code	Course Title	Lectures (L) Hours per week	Tutorial (T) Hours per week	Practical (P) Hours per week	Total Credits (16)
ENV2151	Environmental Studies-I *	2	-	-	2
ENV2251	Environmental Studies-II *	2	-	-	2
ENV2152/ ENV2252	Environmental Studies *	4	-	-	4

(Environmental Studies is mandatory for all undergraduate courses and is taught in three different schemes during first year)*

ENVIRONMENTAL STUDIES

Syllabus - Semester First

ENVIRONMENTAL STUDIES-I

Course Code: ENV2151

Credit Units: 02

Course Objective:

The term environment is used to describe, in the aggregate, all the external forces, influences and conditions, which affect the life, nature, behaviour, growth, development, and maturity of living organisms. At present a great number of environmental issues, have grown in size and complexity day by day, threatening the survival of mankind on earth. A study of environmental studies is quite essential for handling environmental disasters and industrial management. The objective of environmental studies is to enlighten the masses about the importance of the protection and conservation of our environment and control of human activities which has an adverse effect on the environment.

Course Contents:

Module I: The multidisciplinary nature of environmental studies

Definition, scope and importance, Need for public awareness

Module II: Natural Resources - Renewable and non-renewable resources

Natural resources and associated problems

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

Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

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

Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

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.

Module III: 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 ecosystems:

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

Module IV: 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 mega-diversity nation, hot-spots of biodiversity, threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts, endangered and endemic species of India, conservation of biodiversity: in-situ and ex-situ conservation of biodiversity.

Examination Scheme:

Components	CT	HA	S/V/Q	A	EE
Weightage (%)	15	5	5	5	70

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, A: Attendance, EE: End Semester Examination

Text & References:

- Agarwal, K.C., 2001, Environmental Biology, Nidi Publ. Ltd. Bikaner.
- Bharucha, E., The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380013, India.
- Brunner, R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p.
- Clark, R.S., Marine Pollution, Clarendon Press Oxford (TB).
- Cunningham, W.P., Cooper, T.H., Gorhani, E.& Hepworth, M.T., 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.
- De, A.K., Environmental Chemistry, Wiley Eastern Ltd.
- Down to Earth, Centre for Science and Environment (R).
- Gleick, H.P., 1993, Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute, Oxford University Press, 473p.
- Hawkins, R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R).
- Heywood, V.H.& Waston, R.T., 1995, Global Biodiversity Assessment, Cambridge University Press, 1140p.
- Jadhav, H.& Bhosale, V.M., 1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi 284 p.
- Mckinney, M.L. & School, R.M., 1996, Environmental Science Systems & Solutions, Web enhanced edition, 639p.
- Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB).
- Miller, T.G., Jr. Environmental Science, Wadsworth Publishing Co. (TB).
- Odum, E.P., 1971, Fundamentals of Ecology, W.B. Saunders Co. USA, 574p.
- Rao, M N. & Datta, A.K., 1987, Waste Water treatment, Oxford & IBH Publ. Co. Pvt. Ltd., 345p.
- Sharma, B.K., 2001, Environmental Chemistry. Geol Publ. House, Meerut.
- Survey of the Environment, The Hindu (M).
- Townsend, C., Harper, J., and Michael Begon, Essentials of Ecology, Blackwell Science.
- Trivedi, R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R).

Syllabus - Semester Second

ENVIRONMENTAL STUDIES-II

Course Code: ENV2251

Credit Units: 02

Course Objective:

The term environment is used to describe, in the aggregate, all the external forces, influences and conditions, which affect the life, nature, behaviour, growth, development, and maturity of living organisms. At present a great number of environmental issues, have grown in size and complexity day by day, threatening the survival of mankind on earth. A study of environmental studies is quite essential for handling environmental disasters and industrial management. The objective of environmental studies is to enlighten the masses about the importance of the protection and conservation of our environment and control of human activities which has an adverse effect on the environment.

Course Contents:

Module I: Environmental Pollution

Definition, causes, effects, and control measures of: air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, and nuclear pollution.

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, earthquake, cyclone, and landslides.

Module II: Social Issues and the Environment

From unsustainable to sustainable development, Urban problems related to energy

Water conservation, rain water harvesting, and watershed management

Resettlement and rehabilitation of people, its problems and concerns, case studies

Environmental ethics: issues and possible solutions

Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies

Wasteland reclamation

Consumerism and waste products

Environmental Protection Act, 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

Module III: Human Population and the Environment

Population growth, variation among nations

Population explosion – Family Welfare Programmes, 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

Module IV: 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 (Field work equal to 5 lecture hours)

Examination Scheme:

Components	CT	HA	S/V/Q	A	EE
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- Trivedi, R.K. and Goel, P.K., Introduction to air pollution, Techno-Science Publication (TB).
- Wanger, K.D., 1998, Environmental Management, W.B. Saunders Co. Philadelphia, USA 499p.

Syllabus - Semester First / Second

ENVIRONMENTAL STUDIES

Course Code: ENV2152 / ENV2252

Credit Units: 04

Course Objective:

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