Environmental Science (Hons.)

Program specific outcomes (PSOs)

- Graduate students will be able to acquire information, become competent professionals with a solid foundation in environmental science, and apply that knowledge to become qualified for key roles in academia, business, government, and non-government entities as skilled manpower.
- The students will be able to work effectively in multidisciplinary teams as collaborators and scientific communicators to tackle complex environmental issues on a local, national, and international scale.
- Due to the interdisciplinary nature of environmental research, students have the option of choosing to pursue post-graduate study in fields other than environmental science, such as Conservation Biology, Geospatial Science, etc.

Programme outcome

- Students will be able to build up sound knowledge on concept of environment, environmental components, environmental education
- Understand how interactions between organisms and their environments drive the dynamics of individuals, populations, communities, and ecosystems
- Become well-versed in earth science, environmental chemistry, and environmental physics.
- Students will gain knowledge about the causes, consequences, and management procedures of various types of environmental pollution.
- Students will be to acquire in-depth understanding of India's environmental laws and policies towards achieving environmental sustainability
- Students will acquire thorough knowledge of geographic information systems and remote sensing (GIS) as well as data management
- Become well-versed with methods for managing biological diversity including wildlife and safeguarding it at the national and international level.
- Student will acquire basic knowledge on environmental toxicology and environmental biotechnology and applications of environmental biotechnological aids.
- The proposed programmes will develop sound knowledge on environmental hazards and waste management for achieving the circular bioeconomy
- Acquire knowledge about the process of environmental impact assessment and environmental management system
- The proposed programme will deliver to obtain practical experience in the environmental domain that will be helpful for environmental monitoring and successful implementation of environmental management practices.

Course outcome of Environmental Science (Hons.)

CO1.1: Gain knowledge on the basic of environment, components of Environment, Scope and multidisciplinary nature in environmental science, Man-environment relationships; aware about Earth Summits, recent Conventions on climate change & Public awareness
CO1.2: Aware about goals of Environmental Education, process of environmental education at different levels, and know about different environmental movements
CO1.3: Acquire knowledge on different cell organelles and preliminary concept on gene
CO1.4: Aware about different laws on genetics & evolution theory
Practical outcome:
CO1: Gain practical knowledge on cytological preparation of dividing cell and identification of different meiotic and mitotic stages

CO2.1: Imparts basic knowledge regarding general taxonomical rules,classification & studies flora & fauna
CO2.2: Gain general concept of Ecological classification, adaptation, Ecological factors and Shelford's Law, Liebig law
CO2.3: Aware about the Structural and functional aspects of major ecosystems & Energy flow models and concept of biomes and its classification
CO2.4: Aware about Biotic Community and Nutrient cycle
Practical outcome:
CO2: Gain practical knowledge on measurement of DO, Alkalinity and Acidity of surface water
Acquire practical knowledge on staining and identification zooplankton

CO3.1: Acquire knowledge on Fundamental Concepts of General Chemistry
CO3.2: Gain knowledge on general concepts & ideas on Biochemistry
CO3.3: Aware about the Chemical Equilibrium and Kinetics and Acid-base reactions
CO3.4: Aware about the principle and process of sedimentation, coagulation, precipitation; Concept of solubility product; filtration and adsorption
CO3.5: Imparts basic knowledge regarding fundamental concept of Atmospheric Chemistry
Practical outcome:
CO3: Gain practical knowledge about biochemical measurement of chlorophyll, carbohydrate and protein
Acquire practical knowledge on measurement of Primary productivity and Hardness of a water body

CO4.1: Aware about radioactivity and its applications
CO4.2: Gain basic knowledge on thermodynamics & pollutants dispersion
CO4.3: Imparts basic knowledge on biophysics in environmental science
CO4.4: Acquire knowledge on guiding principles of different instruments & their applications

CO5.1: Acquire brief knowledge on evolution of earth, drift theory and geological time scale
CO5.2: Aware about climate and its classification
CO5.3: Know about Mineral resources and Water resources; concept, type and characteristics of aquifers
CO5.4: Acquire brief knowledge on Remote Sensing and GIS

Practical outcome:

CO5: Gain practical knowledge on identification of different surface features from toposheet and visual interpretations of satellite imagery
Acquire practical knowledge of measurement of climatic parameters of wind speed & direction, relative humidity & temperature

CO6.1: Learn about different types of natural resources and their current status
CO6.2: Gain brief idea about soil
CO6.3: Know the classification of energy resources
CO6.4: Acquire details idea about Coal, petroleum, natural gas and oil
CO6.5: Know briefly about renewable energy resources
CO6.6: Aware about alternate Sources of Energy
CO6.7: Imparts basic knowledge on biodiversity and its distribution, conservation, threats
Practical outcome:
CO6: To gain practical knowledge about soil parameters of pH, temperature, soil porosity, bulk density, organic carbon

CO7.1: Know briefly on general concept, principles & application of green chemistry
CO7.2: Aware about the usage of green technology
CO7.3: Gain idea about products from green chemicals & its applications
CO7.4: Acquire theoretical knowledge on different instruments used in environmental samples analysis

CO8.1: Know briefly on different concept of toxicology and discuss the different therapeutic index
CO8.2: Gain idea about on Environmental biotechnology, techniques and its application in environmental field
CO8.3: Acquire basic knowledge about biofertiliser, biopesticide, biofuel, and biogas

CO9.1: Acquire basic concept on law, rules, act, treaty and Powers and Functions of Govt. Agencies for pollution control
CO9.2: Know briefly on objectives and principles of the Environmental acts
CO9.3: Gain basic ideas, definition, goals, techniques and methods of EIA

CO10.1: Acquire basic knowledge on the definition, types, causes, distribution, consequences and mitigation measure of natural hazards
CO10.2: Gain idea on Disaster Management
CO10.3: Know briefly the concept on environmental management and Environmental Management System
CO10.4: Acquire knowledge on hazardous waste management, Municipal Solid Waste Management; Biomedical waste management; Industrial Pollution Management

CO11.1: Gain idea on pollution, poverty, and population and their relationship
CO11.2: Acquire knowledge on source and effect of Air Pollution indoor air pollution, photochemical smog, and impact of air pollution on global environment
CO11.3: Builds up knowledge about source of water pollution and its impact on different water bodies
CO11.4: Gain basic knowledge on source, types and effects of soil pollution
CO11.5: Acquire basic knowledge on Thermal Pollution and its effects

CO11.6: Builds up knowledge on characteristics of automobile emissions and their effects
CO11.7: Know about Fireworks Pollution and its effects
Practical outcome:
CO11: Acquire practical knowledge about estimation of nitrate-nitrogen, Phosphate, Chloride from water sample
Gain practical knowledge about measurement of Noise, Dust fall

CO12.1: Acquire knowledge on Environmental Engineering technique and its application
CO12.2: Gain knowledge on Environmental Modelling Steps, Limitations of model application, fate of chemicals, sophistication levels in modelling
CO12.3: Builds up knowledge on general concept of statistical sampling
CO12.4: Gain idea on different measurement processes of statistics

CO13.1: Acquire concept on the scope of Environmental Economics; grow knowledge on Environmental Kuznets's Curve; grow knowledge on Cost - Benefit analysis, Polluter's Pay Principle
CO13.2: Gain basic knowledge on Environmental Accounting and Auditing
CO13.3: Know about definition and concept on environmental management, and functions of management
CO13.4: Builds up knowledge on management of air pollution, water pollution, noise pollution in respect to Indian scenario, Ganga Action Plan (GAP), Yamuna Action Plan (YAP)
CO13.5: Imparts basic knowledge on system used for management of Municipal Solid Wastes (MSW), biomedical wastes, plastic wastes, hazardous wastes, radioactive waste

CO14.1: Gain idea on wildlife management, conservation practices, and role of Govt. in wildlife management
CO14.2: Builds up knowledge on the relation between human and wild life and their co existence in environment.
CO14. Acquire knowledge on Wild life conservation act, and status of current protected areas in India

Practical outcome:
CO14: Acquire practical knowledge from educational tour

SEC
SEC1
CO.1: Acquire basic knowledge on remote sensing, process of remote sensing, remote sensing platforms, sensors
CO.2: Gain basic idea on Geographical Information System (GIS)

SEC2
CO.1: Gain basic knowledge on wildlife conservation, techniques of different animal survey, and nursery technology
CO.2: Acquire elementary idea on ecotourism, rural truism and adventure tourism. Builds up knowledge on impacts and management of ecotourism

DSE

DSE1

CO5.1: Acquire basic knowledge on nature, types and effects of radiation.

CO5.2: Gain basic idea about sources and categories and effects of pesticide pollution

CO5.3: Acquire basic knowledge on metal pollution

CO5.4: Acquire theoretical knowledge about sampling, analytical techniques like titrimetry, gravimetry and potentiometry. Gain basic idea on the environmental application of ultrasound, RADAR and LASER

CO5.5: Gain theoretical idea on Standard Plate Count and Coliform test which are used for bacteriological examination of water

DSE2

CO.1: Acquire basic knowledge on health, disease, epidemiology and epidemiological methods

CO6.2: Acquire concept on water, air, vector borne diseases. Gain knowledge on some communicable diseases and non-communicable diseases. Learn about immunology.

CO.3: Gain basic knowledge on health programs and family planning practices in India, nutrition and health, and role of Information Technology in environment and human health

CO.4: Builds up fundamental knowledge on environmental stress physiology

DSE3

DSE.1: Acquire knowledge on water resource, and hydrological cycle

DSE.2: Learn about physical, chemical and biological properties of water

DSE.3: Builds up knowledge on characteristics of surface and ground water, and formation and properties of aquifers. Acquire knowledge on watershed and its management, and rain water harvesting

DSE.4: Gain knowledge on water resources scenario in India

DSE.5: Learn about the river valley projects in India and their environmental and social impacts. Acquire knowledge on international conflicts on water sharing between India and its neighbours

DSE4

DSE.1: Acquire concept on sources, classification and chemical composition of solid waste. Gain knowledge on characteristics of municipal solid waste, hazardous waste and biomedical waste

DSE.2: Know about the effect of solid waste disposal and industrial effluent discharge on environment

DSE.3: Learn about the management of different types of solid waste

DSE.4: Gain knowledge on the types, effect and management of industrial waste

DSE.5: Acquire knowledge on resource recovery, and green techniques used for waste treatment

DSE.6: Gain concept on energy recovery processes from waste

DSE.7: Acquire concept on integrated waste management