

Core course 8 **Code: BO5CRT08**
ENVIRONMENTAL SCIENCE AND HUMAN RIGHTS
(Theory 54 hrs; Practical 36 hrs; Credits 3 + 1)

Objectives:

- Acquaint the student with the significance of Environmental Science and Human rights.
- Make the students aware about the extent of the total biodiversity and the importance of their conservation.
- Help the student to design novel mechanisms for the sustainable utilization of natural resources.
- Enable the students to understand the structure and function of the ecosystems.
- Enable the students to understand various kinds of pollution in the environment, their impacts on the ecosystem and their control measures
- Make the students aware about various environmental laws in India and the role of various movements in the protection of nature and natural resources

ENVIRONMENTAL SCIENCE (36 hours)

Module 1: (10 hrs)

Unit:1 Introduction to ecology- introduction, definition, scope and relevance; sub-divisions of ecology - autecology, synecology and ecosystem ecology.

Population: population size, density, natality, mortality, age, rate of natural increase, growth form and carrying capacity, population interactions between species - competition, parasitism, predation, commensalism, mutualism, neutralism.

Community: community concept, biotic community, species diversity, species richness, dominance; growth forms and structure, trophic structure, ecotone, edge effect, habitat, ecological niche, micro-climate, ecological indicators, keystone species.

Unit 2: Ecosystems -Structure and function of ecosystems, ecosystem components: abiotic and biotic - producers, consumers, decomposers. Productivity - primary and secondary - gross and net productivity - homeostasis in the ecosystem.

Unit 3:Concept of energy in ecosystems - energy flow, food chain, food web, trophic levels, trophic structure and ecological pyramids - pyramid of numbers, biomass, energy. Nutrient cycles - biogeochemical cycles of C and N₂. Ecosystem development: ecological succession, process, climax community, hydrosere, xerosere.

Module 2: (8hrs)

Unit 1:Biodiversity: definition, types, examples – endemism - hot spots; hot spots in India - Western Ghats as hot spot. Wetlands and their importance. Biodiversity loss - IUCN threat categories, Red data book; causes and rate of biodiversity loss - extinction, causes of extinction.

Conservation: methods - in-situ, ex-situ. Joint Forest management - people's participation in biodiversity conservation: community reserve, eg. Kadalundi-vallikkunnu.

Unit:2 Remote sensing and GIS: introduction, principle, application of remote sensing and GIS in environmental studies and biodiversity conservation (brief account).

Unit 3:Ecotourism: ecotourism centers in Kerala - Thenmala and Thattekkad WLS.

Module 3: (8 hrs)

Unit 1: Environmental pollution - introduction, definition; Air pollution - air pollutants, types, sources, effect of air pollution on plants and humans, control measures; Water pollution – common pollutants, sources, impact, control measures; water quality standards - DO and BOD; eutrophication. Soil Pollution - causes, sources, solid waste, biodegradable, non-biodegradable, management of solid waste, composting, e – waste.

Unit 2: Environmental issues - global warming, greenhouse effect, climate change - causes and impact, ozone layer depletion. Carbon sequestration.

Module 4: (10 hrs)

Unit 1: Conservation of nature- Global conservation efforts - Rio Earth summit - Agenda 21, Kyoto protocol, COP15 (15 The Conference of the parties under the UN framework convention on climate change) and Paris protocol - major contributions. Conservation strategies and efforts in India and Kerala. Organizations, movements and contributors of environmental studies and conservation: organizations - WWF, Chipko, NEERI; contributors - Salim Ali, Sunder Lal Bahuguna, Madhav Gadgil, Anil Agarwal, Medha Patkar, Vandana Siva (brief account only).

Unit 2: Environmental Legislation and Laws: Environment (protection) Act 1986, Air (protection and control of pollution) act, 1981 Water (protection and control of pollution) Act, 1974, Wildlife (protection) Act, 1972, Forest (conservation) Act, 1980, Biological Diversity Act (2002) [brief account only].

Module - 5 (18 Hours)

Unit 1 - Human Rights

An Introduction to Human Rights, Meaning, concept and development –History of Human Rights-Different Generations of Human Rights- Universality of Human Rights- Basic International Human Rights Documents - UDHR ,ICCPR,ICESCR.-Value dimensions of Human Rights

Unit 2 - Human Rights and United Nations

Human Rights co-ordination within UN system- Role of UN secretariat- The Economic and Social Council- The Commission Human Rights-The Security Council and Human rights- The Committee on the Elimination of Racial Discrimination- The Committee on the Elimination of Discrimination Against Women- the Committee on Economic, Social and Cultural Rights- The Human Rights Committee- Critical Appraisal of UN Human Rights Regime.

Unit 3- Human Rights National Perspective

Human Rights in Indian Constitution – Fundamental Rights- The Constitutional Context of Human Rights-directive Principles of State Policy and Human Rights- Human Rights of Women-children –minorities- Prisoners- Science Technology and Human Rights- National Human Rights Commission- State Human Rights Commission- Human Rights Awareness in Education.

PRACTICAL (36 hrs)

1. Estimation of CO, Cl, and alkalinity of water samples (Titrimetry)
2. Determination of pH of soil and water.
3. Assessment of diversity, abundance, and frequency of plant species by quadrat method (Grasslands, forests).
4. Study of the most probable number (MPN) of Coliform bacteria in water samples.

5. EIA studies in degraded areas (Sampling, Line transect, Quadrate).
6. Ecological adaptations in xerophytes, hydrophytes, epiphytes, halophytes and mangroves.

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 47. Universal Human Rights in Theory and practice, Jack Donell Future of Human rights, Upenda Baxi.
 48. Understanding Human Rights An over view O P Dhiman
 49. Reforming Human Rights, D P Khanna
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