**Teaching plan (2022-23)**

**(Monthly)**

**Subject: *Environmental Studies***

**Teacher: Dr Nazia Talat**

Objective: to train students to cater to the need for ecological citizenship through development of a strong foundation on the critical linkages between ecology-society-economy

The course will empower the undergraduate students through:

1. Gaining of in-depth knowledge on natural processes and resources that sustain life and govern economy.

2. Understanding and predicting the consequences of human actions on the web of life, global economy, and quality of human life.

3. Development of critical thinking for shaping strategies (scientific, social, economic, administrative, and legal) for environmental protection, conservation of biodiversity, environmental equity, and sustainable development.

4. Acquisition of values and attitudes towards understanding complex environmental economic- social challenges, and active participation in solving current environmental problems and preventing the future ones.

5. Encouraging adoption of sustainability as a practice in life, society, and industry

**Sem-1 (November 2022-March 2023)**

**1. November 2022:**

***Unit 1: Introduction to Environmental Studies***

Multidisciplinary nature of environmental studies; Scope and importance of EVS; Concept of sustainability and sustainable development; Brief history of environmentalism

***Unit 2: Ecosystems***

Definition and concept of Ecosystem: Structure of ecosystem (biotic and abiotic components);

Functions of Ecosystem: Physical (energy flow), Biological (food chains, food web, ecological succession).

**2. December 2022:**

***Unit 2: Ecosystems***

Biogeochemical (nutrient cycling) processes. Concepts of productivity, ecological pyramids and homeostasis; Types of Ecosystems: Tundra, Forest, Grassland, Desert, Aquatic (ponds, streams, lakes, rivers, oceans, estuaries); importance and threats with relevant examples from India

Ecosystem services (Provisioning, Regulating, Cultural, and Supporting); Ecosystem preservation and conservation strategies; Basics of Ecosystem restoration

***Unit 3: Natural Resources***

Forest resources; Goods and Services received from forest resources; Land cover, land use change, land degradation, soil erosion, and desertification; Causes of deforestation; Impacts of mining and dam building on environment, forests, biodiversity, and tribal communities Natural and man-made sources of water; Uses of water; Over exploitation of surface and ground water resources; Floods, droughts, and international & inter-state conflicts over water.

**3. January 2023**

***Unit 3: Natural Resources***

Renewable and non-renewable energy sources; Use of alternate energy sources; Growing energy needs; Energy contents of coal, petroleum, natural gas and bio gas; Agro-residues as a biomass energy source. Case studies: Contemporary Indian issues related to mining, dams, forests, energy, etc.

***Unit 4: Biodiversity and Conservation***

Definition of Biodiversity; Levels of biological diversity; India as a mega-biodiversity nation; Biogeographic zones of India; Biodiversity hotspots; Endemic and endangered species of India; IUCN Red list criteria and categories. Value of biodiversity: Ecological, economic, social, ethical, aesthetic, and informational values of biodiversity with examples; sacred groves and their importance with examples.

Threats to biodiversity: Habitat loss, degradation, and fragmentation; Poaching of wildlife; Man-wildlife conflicts; Biological invasion with emphasis on Indian biodiversity; Current mass extinction crisis;

Biodiversity conservation strategies: in-situ and ex-situ methods of conservation; National Parks, Wildlife Sanctuaries, and Biosphere reserves.

***Unit 5: Environmental Pollution***

Environmental pollution (Air, water, soil, thermal, and noise): causes, effects, and controls; Primary and secondary air pollutants; Air and water quality standards. Related case studies.

**4. February 2023**

***Unit 5: Environmental Pollution***

Nuclear hazards and human health risks; Control measures for various types of urban, industrial waste, Hazardous waste, E-waste, etc; Waste segregation and disposal. Related case studies

***Unit 6: Global Environmental Issues and Policies***

Causes of Climate change, Global warming, Ozone layer depletion, and Acid rain; Impacts on human communities, biodiversity, global economy, and agriculture.

International agreements and programmes: Earth Summit, UNFCCC, Montreal and Kyoto protocols, Convention on Biological Diversity( CBD), Ramsar convention, The Chemical Weapons Convention (CWC), UNEP, CITES, etc.

Sustainable Development Goals: India’s National Action Plan on Climate Change and its major missions. Wildlife Protection Act, 1972; Water (Prevention and Control of Pollution) Act, 1974; Forest (Conservation) Act 1980; Air (Prevention & Control of Pollution) Act, 1981; Environment Protection Act, 1986; Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

***Unit 7: Human Communities and the Environment***

Human population growth: Impacts on environment, human health, and welfare; Carbon foot-print; Resettlement and rehabilitation of developmental project affected persons and communities; relevant, Environmental philosophy: Environmental ethics; Role of various religions and cultural practices in environmental conservation, Environmental communication and public awareness.

**Field Report:**

An online field trip to Yamuna Biodiversity Park will conducted in the month of February. Students will be asked to submit their reports by 15th February. A plantation drive started by University of Delhi is also taken into account. Students need to plant a sapling/seed in the start of the session and take care of it for about 4 months. They will submit report of this activity along with pictures, by 15th February.

**Teaching Learning process**

The teaching–learning methodologies are designed to provide the undergraduate students a comprehensive understanding of the subject in a simplistic manner as well as evoke critical reasoning and analytical thinking among them. The various approaches to teaching–learning process include classroom lectures, video presentations, and ICT enabled teaching tools. For enhancing practical understanding, field visits are encouraged to relevant places in Delhi like Biodiversity parks, Protected areas, Wetlands, Sewage treatment plants, etc.

**Assessment methods**

1. Written examinations (Semester exams, internal assessment)

2. Project work and reports related to field visits and practical learning

3. Assignment/presentations on any contemporary environmental issue

***#same lesson plan will be followed in Semester 2 from April to July, 2023***