

**Revised Syllabus
Under NEP-2020
P.G. Diploma in Environmental Management
W.e.f. Academic Session 2025-2026 onwards**

Course structure for 1-Year P.G. Diploma Program

First Semester for 1-year P.G. Diploma program

Semester	Course category	Course Code	Course title	Credits		Total Credit
				T	P	
I	Discipline Specific Core	SOLS/PGDEM-C-001	DSC-1 Basics of Environmental Sciences	3	-	3
		SOLS/PGDEM- C-002	DSC -2 Natural Resource Management	3	-	3
		SOLS/PGDEM-C-003	DSC -3 Environmental Monitoring and Pollution Control	3	-	3
		SOLS/PGDEM-C-004	DSC Practical	-	4	4
	Discipline Specific Elective (Any 1 out of Minimum 2 electives)	SOLS/PGDEM-E-001	DSE-1 Waste Management	4	-	4
		SOLS/PGDEM-E-002	DSE-2 Traditional Ecological Knowledge	4	-	4
		SOLS/PGDEM-E-003	DSE Practical Or Field Work / Project Work	-	3	3
Total				13	07	20

Note: 1. In lieu of only Elective Practical (3 credits) the departments may offer 3 credit additional course (Field work/Project).

Second Semester for 1-year P.G. Diploma program

Semester	Course category	Course Code	Course title	Credits		Total Credit
				T	P	
II	Discipline Specific Core	SOLS/PGDEM-C-005	DSC-1 EIA and Environmental Management	3	-	3
		SOLS/PGDEM-C-006	DSC -2 Biodiversity Conservation and Management	3	-	3
		SOLS/PGDEM-C-007	DSC -3 Disaster Management	3	-	3
		SOLS/PGDEM-C-008	DSC Practical	-	4	4
	Discipline Specific Elective (Any 1 out of Minimum 2 electives) Or Dissertation/ Industrial Training)	SOLS/PGDEM-E-004	DSE-1 Environmental Laws and Policies	4	-	4
		SOLS/PGDEM-E-005	DSE-2 Wildlife Management	4	-	4
		SOLS/PGDEM-E-006	DSE Practical	-	3	3
Total				13	07	20
NHEQF Level- 6.5	Student on successfully completing one-year PG Diploma programme (i.e., securing minimum required 40 credits will be awarded "Postgraduate Diploma in Environmental Management.					

Note: 1. In lieu of elective (Theory and practical= 4+3 credits) the students may opt Dissertation/Industrial training of 7credits.

First Semester for 1-year P.G. Diploma program

Course Code: SOLS/PGDEM-C- 001

Course Title: DSC-1 Basics of Environmental Sciences

(03 credits)

Unit I. Environment

- 1.1 Definition, scope and importance of Environmental Sciences
- 1.2 Components of environment: atmosphere, hydrosphere, lithosphere and biosphere
- 1.3 Concept of Biosphere-2, Technosphere and Noosphere
- 1.4 Various activities under national environment awareness Campaigns (NEAC)

Unit II. Man and Environment Relationship

- 2.1 Pre-historic man and Environment
- 2.2 Hunting and Gathering society and Environment
- 2.3 Pastoralism and Environment
- 2.4 Agro-society, Industrial society and Environment
- 2.6 Future Society (Sustainable Society)

Unit III. Religion, Culture and Environment

- 3.1 Role of religion, culture and traditions in conserving environment
- 3.2 Hinduism and Environment
- 3.3 Buddhism and Environment
- 3.4 Islam and Environment
- 3.5 Christianity and Environment

Unit IV. Ecosystem

- 4.1 Structure and types of an ecosystem
- 4.2 Energy pathways and ecological processes
- 4.3 Ecosystem productivity (primary and secondary)
- 4.4 Biogeochemical cycles: Nitrogen, Carbon, Phosphorus, Sulphur, Water and Oxygen
- 4.5 Food chain, food web and ecological pyramids
- 4.6 Ecological succession: primary and secondary succession, climax communities and trends in succession

Unit V. Environmental Issues and Problems

- 5.1 Green house effect, Global warming and climate change
- 5.2 Conflicts on emission of green house gases
- 5.3 Eutrophication
- 5.4 Mega dams and its impact on Environment
- 5.5 International and national water disputes and coastal zone conflicts

Course Code: SOLS/PGDEM-C- 002

Course Title: DSC-2 Natural Resource Management

(03 credits)

Unit I. Principles of Natural Resource Management

- 1.1. Natural resources- concepts, types and their values
- 1.2. Process of resource depletion
- 1.3. Ecosystem services by various natural resources

Unit II. Forest and Wildlife Resources and their Management

- 2.1 Forest resources: Major Forest types, their characteristics and distribution, status of forest cover
- 2.2 Forest use, over exploitation and management practices
- 2.3 Wildlife resources: Current status, services and threats
- 2.4 Human-wildlife conflict and its resolution
- 2.5 Principles and practices of wildlife management: Need for wild life planning

Unit III. Water Resources and their Management

- 3.1 Water resources: Historical background, world scenario and current challenges, status of surface and groundwater
- 3.2 Use and over exploitation of surface and ground waters
- 3.3 Integrated Water Resource Management (IWRM): Key challenges and issues
- 3.4 Legal aspects of water resources and management

Unit IV. Energy Resources and their Management

- 4.1 Definition, concept and classification of energy resources
- 4.2 Non-renewable energy resources
- 4.3 Renewable energy resources
- 4.4 Energy Management: Energy crisis, energy audit and sustainable use of energy resources

Unit V. Geo Resources and their Management

- 5.1 Mineral resources: Minerals, their classification, resources and reserves, exploitation of mineral resources
- 5.2 Environmental impact of extracting, processing and smelting of minerals
- 5.3 Conservation and Management of geo-resources

Course Code: SOLS/PGDEM-C- 003

Course Title: DSC-3 Environmental Monitoring and Pollution Control

(03 credits)

Unit I. Environmental Monitoring

- 1.1 Concept and objectives of environmental monitoring
- 1.2 Global environmental monitoring system (GEMS)
- 1.3 National environmental monitoring programmes
- 1.4 Bio-indicators and biological monitoring

Unit II. Air Pollution

- 2.1 Sources of air pollution
- 2.2 Effects of pollutants on human beings, plants and animals
- 2.3 Methods of monitoring of gaseous and particulate pollutants
- 2.4 Control of air pollution

Unit III. Water Pollution

- 3.1 Major sources of water pollution
- 3.2 Effects of water pollution on animals, plants and human beings
- 3.3 Sewage and wastewater treatment and recycling
- 3.4 Industrial effluent treatment

Unit IV. Noise Pollution

- 4.1 Sources of noise pollution
- 4.2 Measurement of noise, exposure levels and standards
- 4.3 Impact of noise on human health
- 4.4 Noise control and abatement measures

Unit V. Radioactive and Thermal Pollution

- 5.1 Radioactive pollution: causes and consequences
- 5.2 Radioactive fallout, Chernobyl Accident: Three Mile Island accident, Fukushima radio-active leakage
- 5.3 Radioactive waste management
- 5.4 Thermal pollution: causes and consequences

Course Code: SOLS/PGDEM-C- 004

Course Title: DSC Practical

(03 credits)

1. Analysis of various components of ecosystems.
2. Calculation of frequency, density and abundance of different ecosystem.
3. Calculation of Importance Value Index (IVI) for grassland ecosystems/forest patches.
4. Monitoring of biological diversity and calculation of Shannon Wiener diversity index in aquatic/ terrestrial habitats.
5. To inventory of natural resources of any forest ecosystem located in nearby area.
6. To study the ecosystem services by various natural resources.
7. To study the effects of dams on the forest resources and tribal communities.
8. To understand the drainage systems of river Ganga, Yamuna and Ramganga.
9. Determination of dissolved oxygen, BOD and COD in a given water samples.
10. Determination of Total solid, total dissolved solids (TDS) and total suspended solids in a water sample.
11. Determination of alkalinity, acidity and total hardness in given water samples.
12. Determination of chloride in a given water samples.

Course Code: SOLS/PGDEM-E- 001

Course Title: DSE-1 Waste Management

(04 credits)

Unit I: Introduction to Waste and Its Classification

- 1.1 Concepts, Scope, historical development, and need for sustainable waste management
- 1.2 Types of Waste Solid, liquid, hazardous, biomedical, and e-waste
- 1.3 Sources and Characteristics of municipal, industrial, agricultural, commercial, and domestic Waste
- 1.4 Waste Generation trends

Unit II: Solid Waste Management

- 2.1 Collection and transportation and storage of Municipal Solid Waste (MSW)
- 2.2 Segregation and Recycling: Source segregation, material recovery, and recycling processes.
- 2.3 Aerobic and anaerobic composting, vermin-composting, organic waste management, biogas
- 2.4 Types of landfills, sanitary landfills, incineration technologies, and environmental concerns

Unit III: Hazardous and Biomedical Waste Management

- 3.1 Industrial, chemical, hazardous and toxic waste categories and sources
- 3.2 Waste treatment and disposal methods (physical, chemical, and biological method)
- 3.3 Biomedical Waste Management Rules and Practices
- 3.4 Occupational hazards and safety measures, risk to waste workers, PPE, training, and emergency protocols.

Unit IV: Liquid Waste, E-Waste, and Plastic Waste

- 4.1 Wastewater and Sewage Management: Urban and rural systems, decentralized treatment (DEWATS), reuse options
- 4.2 E-Waste: Generation and Impacts: Composition, toxic components, and informal recycling issues.
- 4.3 Plastic Waste Management: Single-use plastics, Extended Producer Responsibility (EPR), recycling technologies.
- 4.4 Policy Framework and Rules: Plastic Waste Management Rules, E-Waste Rules, and CPCB guidelines

Unit V: Sustainable Waste Management and Policy Approaches

- 5.1 3R principle and circular economy, cradle-to-cradle approaches
- 5.2 Community participation and behavioral change, role of households, SHGs, schools, and NGOs in waste management
- 5.3 Policies, Acts, and Institutional Frameworks, SWM Rules 2016, SBM (Urban & Gramin), Environment Protection Act
- 5.4 Best Practices and Global Case Studies: Zero waste cities, successful models from India and abroad

Course Code: SOLS/PGDEM-E- 002

Course Title: DSE-2 Traditional Ecological Knowledge

(04 credits)

Unit I. Introduction

- 1.1. Definition, concept, and scope of TEK
- 1.2. TEK in different forms (stories, legends, folklore, rituals, folk songs, dictums, crafts and artifacts)
- 1.3. Language and traditional knowledge

Unit II. Culture, Sacred, Myth, Rituals and Beliefs

- 2.1. Basic concept of society, culture and religion
- 2.2. Nature and objectives of comparative religion (caste, community and their culture)
- 2.3. Basic feature of religion and myths, rituals and beliefs associated with TEK in Hinduism, Buddhism, Islam, Jainism and Christianity etc.
- 2.4. TEK in Indian Himalayan states

Unit III. TEK and Natural Resources Management

- 3.1. TEK for forest and biodiversity conservation and wildlife management
- 3.2. TEK for water harvesting and land management
- 3.3. TEK related with medicinal plants and healthcare system
- 3.4. TEK related with agriculture, horticulture and cattle rearing

Unit IV. Knowledge Transfer: Old Concepts and Barriers

- 4.1. Old concepts and barriers in transferring indigenous traditional knowledge
- 4.2. Old myths in transferring traditional knowledge
- 4.3. Ways of prayers, rituals in different communities

Unit V. Documentation and Preservation of TEK

- 5.1. Need for Documentation and Preservation
- 5.2. International laws and policy of TEK
- 5.3. Laws and policy in India for TEK

Course Code: SOLS/PGDEM-E- 003

Course Title: DSE Practical

(03 credits)

(Waste Management)

1. Segregation and composition analysis of municipal solid waste
2. Vermi-composting – preparation, maintenance and product analysis
3. Assessment of construction & demolition (C&D) waste composition
4. Identification and classification of hazardous waste types
5. Visit to a Sewage Treatment Plant (STP)/Effluent Treatment Plant (ETP)

Or

(Traditional Ecological Knowledge)

1. To study origin and evolution of various environmental movements.
2. Preparation of an inventory of TEK for water conservation.
3. Preparation of an inventory of TEK for biodiversity conservation.
4. Preparation of an inventory of TEK related to medicinal plants.
5. Documentation of traditional technology of subsistence (Artifacts, Crafts, Handlooms etc.)

Second Semester for 1-year P.G. Diploma program

Course Code: SOLS/PGDEM-C- 005

Course Title: DSC-1 EIA and Environmental Management

(03 credits)

Unit I. Environmental Impact Assessment (EIA)

- 1.1 Concept, scope and objectives of EIA
- 1.2 Developmental projects under EIA
- 1.3 Impact assessment methodologies and Procedure of EIA
- 1.4 EIA law, policy and notifications
- 1.5 Public consultation
- 1.6 Concept of cumulative impact assessment
- 1.7 Statuary clearance procedure

Unit II. Environmental Management

- 2.1 Concept, objective and scope of environmental Management
- 2.2 Environmental management in terms of developmental projects
- 2.3 Environmental management and sustainability

Unit III. Environmental Management Plan

- 3.1 Concept, scope, objectives and guidelines for EMP
- 3.2 Development of EMP- air, water, groundwater, noise and land
- 3.3 Rehabilitation and resettlement
- 3.4 Compensatory afforestation

Unit IV. Environmental Auditing

- 4.1 Principles, objectives and guidelines of environmental auditing
- 4.2 Methodology and basic structure of environmental auditing
- 4.3 Procedure of environmental auditing
- 4.4 ISO: 9001, ISO:14001, ISO 19011, ISO: 45001series

Course Code: SOLS/PGDEM-C- 006

Course Title: DSC-2 Biodiversity Conservation and Management

(03 credits)

Unit I. Introduction to Biodiversity

- 1.1 Concept and values of biodiversity
- 1.2 Biodiversity at different levels (genetic, species and ecosystem)
- 1.3 Magnitude and distribution of biodiversity

Unit II. Threats to Biodiversity

- 2.1 Threats to biodiversity: Habitat loss and fragmentation, Genetic drift, Inbreeding, Disturbance, Pollution, Climate Change, Overexploitation, Invasive Species, Disease
- 2.2 Concept of endemism and Biodiversity hotspots
- 2.3 Human wildlife conflicts and its solutions

Unit III. Biodiversity Conservation and Management

- 3.1 Need for biodiversity conservation and management
- 3.2 Various methods of *In -situ* and *Ex-situ* conservation
- 3.3 Biodiversity and livelihood security
- 3.4 Extinction to species: IUCN threatened species categories, causes of species extinction, endangered species, Red and Green Data Books

Unit IV. Legal Framework for Biodiversity Conservation

- 4.1 The Biological Diversity Act, Rules and Regulations
- 4.2 International efforts for conserving biodiversity *viz.*, CITES, CBD, IUCN, MAB, UNEP, UPOV and WTO
- 4.3 International treaty on Plant Genetic Resources, International Agreement for conserving biodiversity, wetland conservation, rangeland management

Course Code: SOLS/PGDEM-C- 007

Course Title: DSC-3 Disaster Management

(03 credits)

Unit I. Disaster Introduction: an overview

- 1.1 Introduction and definition of vulnerability, risk, hazard, disaster and catastrophe
- 1.2 Hazards in Himalaya, coastal region and plains
- 1.3 Impact of disaster on economy and society
- 1.4 Disaster management and sustainability

Unit II. Natural Disasters

- 2.1 Natural disasters: introduction, meaning and nature
- 2.2 Natural Disasters in Himalaya: Earthquake, cloudburst, Glacier lake outburst (GLOF), Landslides, Snow Avalanches, flash-flood
- 2.3 Natural hazards Cyclone, volcanic eruptions, drought, floods, heat and cold waves and Tsunami

Unit III. Anthropogenic Disasters

- 3.1 Anthropogenic disasters: introduction, meaning and nature
- 3.2 Nuclear disaster, fires (Forest fire, Building, coal, and chemical fires), Desertification causes, effects, management
- 3.3 Transportation Accidents, war, stampede and riots: causes, effects, management

Unit IV. Disaster Mitigation and Management

- 4.1 Risk and Vulnerability assessment: Risk analysis techniques, vulnerability identification, concept and factors associated with vulnerability.
- 4.2 Disaster management cycle
- 4.3 Disaster preparedness: Concept and nature, Disaster preparedness plans, Role of Information, education, communication, & awareness.
- 4.4 Disaster mitigation: Concept, principles, mitigation approaches and strategies.
- 4.5 Disaster Response: Disaster response plans, Search, Rescue and evacuation, Community Health and Casualty Management and damage assessment.
- 4.6 Recovery: Rehabilitation, Its social and economic aspects, Housing to resist disasters
- 4.7 Community based disaster risk reduction strategies

Course Code: SOLS/PGDEM-C- 008

Course Title: DSC Practical

(03 credits)

1. Presentation of procedure of Environmental Impact Assessment (EIA) through flowchart
2. Presentation of procedure of Environmental Clearance through flowchart
3. Presentation of procedure of Environmental Auditing through flow chart
4. Presentation of procedure of Environmental Management Plan (EMP) through flow chart
5. To calculate the Alpha (α) diversity, Beta (β) diversity and total diversity of given community.
6. Survey of biological resources in your locality.
7. Assessment of threats to biodiversity of a given region.
8. Preparation of inventory of endangered and extinct species of plants/animals of Garhwal Himalaya.
9. Understanding the occurrence of various hazards in Himalayas
10. Role of various agencies in disaster management
11. Rehabilitation of People from disaster affected areas
12. Preparation of master plan for any Environmental Hazard mitigation

Course Code: SOLS/PGDEM-E- 004

Course Title: DSE-1 Environmental Laws and Policies

(04 credits)

Unit I. National and International Efforts

- 1.1 Global Environmental issues and problems
- 1.2 Environmental protection in the Indian Constitution(Article 48a, Article 51A (g))
- 1.3 International efforts (Stockholm Conference, Montreal,Kyoto protocol, Ramsar Convention, CITES)

Unit II. National Environmental Laws-1

- 2.1 Wildlife Protection Act 1972 and successive amended
- 2.2 The Water (Prevention and Control of Pollution) Act 1974 and Rules 1975 and successive amended
- 2.3 The Air (Prevention and Control of Pollution) Act 1981 and Rules 1982 and successive amended
- 2.4 The Forest Conservation Act1980 and rules 1981
- 2.5 The Environmental (Protection) Act 1986 and Rules 1986
- 2.6 National Green Tribunal Act 2010

Unit III. National Laws –II

- 3.1 Biomedical waste (Management and handling) Rules1998
- 3.2 Hazardous waste (Management and handling) Rules 1989
- 3.3 E-waste (Management and handling) Rules
- 3.4 Plastic Waste (Management and handling) Rules

Unit IV. National Policies

- 4.1 Forest Policy
- 4.2 Environmental Policy
- 4.3 Water Policy

Course Code: SOLS/PGDEM-E- 005

Course Title: DSE-2 Wildlife Management

(04 credits)

UNIT I: Introduction to Wildlife and Management Principles

- 1.1 Definition of wildlife, wildlife habitat, landscape ecology
- 1.2 Importance and values of wildlife: ecological, economic, cultural, ethical
- 1.3 Wildlife status in India and global context
- 1.4 Goals and objectives of wildlife management
- 1.5 Ecological principles, carrying capacity, niche, population dynamics Habitat requirements, food, cover, water, space

UNIT II: Population Ecology and Wildlife Techniques

- 2.1 Population abundance and density, Age and sex ratio
- 2.2 recruitment, mortality, Life tables, survivorship curves
- 2.3 Minimum Viable Population (MVP), PVA (Population Viability Analysis)
- 2.4 Wildlife Survey and Monitoring Techniques: Direct methods: census, line transect, point count, call count,
- 2.5 Indirect methods: pugmarks, droppings, camera trapping, spoor counts, GIS and Remote Sensing in wildlife management

Unit III. Wildlife of the Himalaya

- 3.1 Unique characteristics and importance of the Himalayan wildlife
- 3.2 Himalayan biodiversity and endemism
- 3.4 Depletion of Himalayan wildlife
- 3.5 Himalayan Wildlife (mammals, birds, reptiles, amphibians, fish, butterflies, wild flora)

UNIT IV: Human–Wildlife Interactions and Conflict Management

- 4.1 Human–Wildlife conflict causes: habitat loss, encroachment, crop raiding, livestock depredation
- 4.2 Species wise specific conflicts: elephant, tiger, leopard, monkey, bear, herbivores
- 4.3 Conflict Mitigation Measures: Early warning systems, physical barriers: trenches, fences, solar barriers, Compensation schemes
- 4.4 Modern tools: drones, GIS risk mapping, automated sensors
- 4.5 Community-based wildlife management approaches

Unit V. Wildlife Conservation and Management

- 5.1 Administrative and legislative measures for protection of wildlife
- 5.2 Protected areas (National parks, sanctuaries, biosphere reserves) in the Himalaya
- 5.3 Tiger Project, Project Elephant, Project Rhino, Project Snow Leopard
- 5.4 Man-Wildlife Conflict: agriculture-wildlife conflict
- 5.5 Wildlife Protection Act 1972 and successive amendments

Course Code: SOLS/PGDEM-E- 006

Course Title: DSE Practical

(03 credits)

(Environmental Laws and Policies)

1. Presentation of salient features of Wildlife Protection Act 1972
2. Presentation of salient features of Water (Prevention and Control of Pollution) Act 1974
3. Presentation of salient features of the Air (Prevention and Control of Pollution) Act 1981
4. Presentation of salient features of The Environmental (Protection) Act and Rules 1986
5. Presentation of salient features of The Indian Forest Conservation Act 1980

Or

(Wildlife Management)

1. Documentation of Wild life conflict hotspots using field mapping & interviews
2. Mitigation measure evaluation for Himalayan Wild life
3. Preparation of a micro-management plan for wildlife habitat.
4. Assessment of anthropogenic pressures to Himalayan Wild life
5. Preparation of corridor maps for species movement (least-cost path analysis)