UNIVERSITY OF RAJASTHAN
JAIPUR
SYLLABUS
POST P.G. DIPLOMA IN
ENVIRONMENTAL STUDIES
(Semester Scheme)

2019-20
INDIRA GANDHI CENTRE FOR HUMAN ECOLOGY, ENVIRONMENTAL AND POPULATION STUDIES, UNIVERSITY OF RAJASTHAN, JAIPUR-302004

Post P.G. Diploma in Environmental Studies (Semester scheme) 2019-20

Post P.G. Diploma in Environmental Studies is divided into two semesters. There are Six theory papers and two practicals in each semester. Grades will be awarded as per norms considered for faculty of science.

Eligibility for admission:

Master's Degree in Science, Medicine, Engineering, Law (with B.Sc.) with at least 50% in aggregate (45% for SC and ST candidates).

### Post P.G. Diploma in Environmental Studies

#### 1st Semester

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Subject code</th>
<th>Course Title</th>
<th>Course category</th>
<th>Credit</th>
<th>Contact hours per week</th>
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<td>1.</td>
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<td>Fundamentals of Ecology</td>
<td>CCC</td>
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<td>DES 702</td>
<td>Natural Resources</td>
<td>CCC</td>
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<td>3.</td>
<td>DES 703</td>
<td>Environmental Pollution</td>
<td>CCC</td>
<td>4</td>
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<td>4.</td>
<td>DES 711</td>
<td>Core Lab</td>
<td>CCC</td>
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<td>5.</td>
<td>DES A01</td>
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<td>ECC</td>
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<td>Elective-3 Disaster Management</td>
<td>ECC</td>
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Dy. Registrar (Academic-I)
University of Rajasthan
Jaipur
Post P.G. Diploma in Environmental Studies

II\textsuperscript{nd} Semester

<table>
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<tr>
<th>S.No.</th>
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<th>Lecture</th>
<th>Tutorial</th>
<th>Practice</th>
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<tr>
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<td>DES 801</td>
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<td>CCC</td>
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Post P.G. Diploma in Environmental Studies

Semester-I

Note: Each paper will have five questions. Questions No. 1 containing short answer type questions from the entire syllabus and will be compulsory.

**DES 701: Fundamentals of Ecology**

60 Hours

- History of Ecology and Environmental Science, Historical development of ecology, Ecological principles.
- Concept of an Ecosystem, Ecological pyramids, Ecological amplitudes, and Ecological niches.
- Structure and Function of an Ecosystem, Food Chain, Food Web, Trophic levels, Ecological energetic, Flow of energy, Biogeochemical cycling.

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DES 702: Natural Resources

Non-renewable resources, Their availability, distribution and economics. (15 Hours)
Renewable Resources, Distribution, rate of depletion and imbalances. (15 Hours)
Wildlife Resources-Necessity of Wildlife, State of Wildlife in India, National Parks, Sanctuaries, Biosphere Reserves and Tiger Projects. (15 Hours)
Methods and Policies of Conservation of Natural resources and wildlife, WWF and CITES. (15 Hours)

DES 703: Environmental Pollution

Air pollution: Types of air pollutants, sources of air pollution, methods of detection and effects of air pollution. (15 Hours)
Water Pollution: Types of water pollutants, sources and impacts of water pollution. (15 Hours)
Land Pollution: Sources and adverse impacts on environment and human health. (15 Hours)
Noise Pollution: Sources and impacts; Radiation Pollution: Sources and Impacts; Space pollution; sources and impacts. (15 Hours)

DES 711: Core Lab based on theory papers

Elective-1

DES A01: Environmental Impact Assessment (EIA)

Introduction, aims and objectives of EIA, Procedures of EIA, in different countries, methodologies of EIA. Cost benefit analysis. (15 Hours)
EIA of Thermal Power and Nuclear Power Plants. (15 Hours)
EIA of Chemical Industries, Steel industries, Paper and pulp industries and distilleries. (15 Hours)
EIA of Mining, EIA of River Valley projects and major harbours. (15 Hours)

Elective-2

DES A02: Environmental Management and Planning

Introduction to environmental management system (EMS): Goals ISO 14000 and ISO 14001. (15 Hours)
Air pollution Control Technologies, Water Pollution control Technologies. (15 Hours)
Impact of use and production of Energy and Mitigations. (15 Hours)
Waste: Generation, Sources and types, Solid Waste management, Toxic and Hazardous waste management. (15 Hours)

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Elective-3

DES A03: Disaster Management

Earth’s process and disaster, Concepts of Hazard, Vulnerability, Risks.
Types of Disasters, Causes and effects.

Geological Disasters: Earthquakes, Volcanic Eruption, Landslides; Wind
and Water Related Natural Disaster: Floods and Flash Floods, Droughts,
Cyclones, Tsunamis, Man-Made Disasters.

Disaster Cycle, Phases of Disaster, Disaster Risk Reduction, Disaster
Preparedness, Disaster Mitigation.

National Policy on Disaster Management (NPDM), Institutional and Legal
Arrangements, International Decade for Natural Disaster Reduction
(IDNDR), Policy for disaster reduction.

DES A11: ElectiveLab based on theory papers

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II Semester

DES 801: Environmental Economics, Auditing and Design

60 Hours

Objectives and scope of EA, types, general audit methodology, Elements of
audit process.

Waste audits, Liability Audits and site Assessment, EMS auditing,
principals of green buildings.

Environmental economics definition, environmental cost, benefit taxes,
accounting, environmental valuation, economy of natural resources,
ecological economics.

Principals of environmental design, benefits and motivation for ED, ED for
manufactured products, ED for building construction, Indian examples.

DES 802: Diversity of Ecosystems

60 Hours

Forest Ecosystem: Types and conservation, Distribution and Productivity

Grassland: Grassland ecosystems, types, distribution and productivity in
grassland ecosystems.

Desert: Desert ecosystems (Hot and Cold) distribution, productivity, and
adaptations.

Aquatic ecosystem: fresh water, estuaries and marine ecosystem.

60 Hours

(15 Hours)

(15 Hours)

(15 Hours)

(15 Hours)

(15 Hours)

(15 Hours)

(15 Hours)

(15 Hours)

(15 Hours)

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DES 803: Sustainable Development
Sustainable agriculture: drip irrigation, organic fertilizers, organic pesticides, integrated pest management.
Sustainable industrialization: clean development mechanism, reduction of emission in air, reduction of effluents in water bodies.
Sustainable forest management: water shed development and conservation, soil conservation, ecosystem peoples' rehabilitation.
Sustainable mining: mining overburden utilization, mine reclamation, afforestation, conservation of indigenous species.

DES 811: Core lab based on theory papers

Elective-1
DES B01: Social Issues and Environment
Environmental ethics, Religion and Environment, Eco-Imperialism with regard to global distribution of resources, eco-fund.
Current environmental issues in India; Narmada Dam, Tehri Dam, Almetti Dam, Silent valley, Doon Valley, Sariska and Narayan Sarovar etc. Chipko movement, Appiko movement.
Scheme of labeling of environmentally friendly products (Ecomark), Public awareness.
Role of NGOs in environmental protection, KSSP, etc. problems and causes related to resettlement and rehabilitation of displaced people, dams-benefits and problems.

Elective-2
DES B02: Energy Resources
Classification of energy resources, renewable and non-renewable energy resources, supply and demand of energy both in urban and rural areas.
Conventional energy resources, coal, oil, natural gas, nuclear energy.
Non-conventional energy sources, solar, wind, hydel, tidal and geothermal energy resources, the nuclear fuels, biomass energy, hydrogen as fuel etc.
Concept of alternative sources of energy, energy from waste, Alternative Fuels for Transportation.

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Elective-3

DES B03: Environmental Pollution Control

Air pollution control technologies and equipments, air quality monitoring.

Water pollution control: Waste Water Treatment, Groundwater Protection
Surface Water Management, Treatment and Supply of Drinking Water.

Control of soil pollution, Soil Conservation, mine land reclamation,
Wasteland reclamation, Control of noise pollution: structural and non-
structural measures.

Role of an individual in prevention of pollution, Pollution case studies.

DES B11: Elective lab based on theory papers