Indraprastha College for Women
University of Delhi

Course Name:	BAP-GRP2-SEM-I, ECO(HONS.) SEM3
Paper Title:	Environmental Science: Theory into Practice I
Unique Paper Code:	2181001001
Semester:	I
Faculty(s):	Viniti Nagar
Year:	2026

Work Plan (Theory)			
Unit No.	Learning Objective	Lecture No.	Topics to be Covered
1	Development of a Strong foundation on the on the critical linkages between ecology- society- economy	1	Introduction to Environmental Studies: Multidisciplinary nature of environmental studies; components of environment: atmosphere, hydrosphere, lithosphere, and biosphere
		2	Concept of sustainability and sustainable development; Brief history of environmentalism
II	Knowing of biotic and non biotic components that make up an ecosystem. Understand how energy flows through an ecosystem. Gain an understanding of how various nutrients are cycled through ecosystems. Understand the difference between ecosystems and biological communities.	3	Definition and concept of Ecosystem: Structure of ecosystem (biotic and abiotic components);
		4	Functions of Ecosystem: Physical (energy flow}, Biological (food chains, food web, ecological succession),
		5	Biogeochemical (nutrient cycling) processes pyramids and homeostasis
		6	Types of Ecosystems: Tundra, Forest, Grassland, Desert, Aquatic (ponds, streams, lakes, rivers, oceans, estuaries); importance and threats with relevant examples from India
		7	Ecosystem services (Provisioning, Regulating, Cultural, and Supporting); Ecosystem preservation. and conservation strategies; Basics of Ecosystem restoration
III	Understanding of Land resource, land cover, land use, Water resources Energy Resources.	8	Land resources: Minerals, soil, agricultural crops, natural forest products, medicinal plants, and forest-based industries and livelihoods;
		9	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
		10	Water resources: Natural and man-made sources; Uses of water; Over exploitation of surface and

			ground water resources; Floods, droughts, and international &interstate conflicts over water
		11	Energy 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
		12	Case studies: Contemporary Indian issues related to mining, dams, forests, energy, etc (e.g ., National Solar Mission, Cauvery river water conflict, Sardar Sarovar dam, Chipko movement, Appiko movement, Tarun Bharat Sangh, etc)
IV	Learning about Environmental pollution, Air pollutants Solid waste management, solid waste management.	13	Environmental pollution (Air, water, soil, thermal, and noise): causes, effects, and controls
		14	Primary and secondary air pollutants; Air and water quality standards
		15	Nuclear hazards and human health risks
		16	Solid waste management: Control measures for various types of urban, industrial waste
		17	Hazardous waste, E-waste, etc; Waste segregation and disposal
		18	Pollution case studies: Ganga Action plan (GAP}, Delhi air pollution and public health issues, Plastic waste management rules, Bhopal gas tragedy, etc

Work Plan (Practical)			
Unit No.	Learning Objective	Lecture No.	Topics to be Covered
1	Introduction to Environmental Studies	1	Analysis of achievement of Sustainable Development Goals of any country.
		2	Submition and correction
II	Ecosystems	3	Schematic collection of data for depicting ecological pyramids in the College campus
		4	Submition and correction
		5	Differentiation of natural and managed ecosystems using Google Earth/Google Map
		6	Field visit to terrestrial and aquatic ecosystems (forests, grasslands, wetlands, biodiversity parks, etc.)
		7	Use of worksheets to identify structure and function of different ecosystems.
		8	Submition and correction
III	Natural Resources	9	Visit to a paper recycling unit/rainwater harvesting plant/solar plant/biogas plant in the College campus
		10	Submition and correction
		11	Comparison of energy demand and consumption of a particular state over the years

			using graphical tools
		12	Submition and correction
IV	Environmental Pollution	13	Assess air quality index (AQI) of any location using real-time air quality parameters
		14	Determine magnitude of solid waste generated in a home/college on a monthly basis
		15	Submition and correction
		16	Prepare water audit report of the college/house/locality/colony
		17	Map solid and liquid discharge of the college/colony and develop a management plan (show it using schematic diagram, and photographs.
		18	Submition and correction

Syllabus		
Unit	**Contents**	**Contact Hours**
I	**Introduction to Environmental Studies**: Multidisciplinary nature of environmental studies; components of environment: atmosphere, hydrosphere, lithosphere, and biosphere Scope and importance; Concept of sustainability and sustainable development; Brief history of environmentalism	2
II	**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), and 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	5
III	**Natural Resources** Land resources: Minerals, soil, agricultural crops, natural forest products, medicinal plants, and forest-based industries and livelihoods; 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	5

	Water resources: Natural and man-made sources; Uses of water; Over exploitation of surface and ground water resources; Floods, droughts, and international &interstate conflicts over water Energy 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 (e.g ., National Solar Mission, Cauvery river water conflict, Sardar Sarovar dam, Chipko movement, Appiko movement, Tarun Bharat Sangh, etc)	
IV	**Environmental Pollution** Environmental pollution (Air, water, soil, thermal, and noise): causes, effects, and controls; Primary and secondary air pollutants; Air and water quality standards Nuclear hazards and human health risks Solid waste management: Control measures for various types of urban, industrial waste, Hazardous waste, E-waste, etc; Waste segregation and disposal Pollution case studies: Ganga Action plan (GAP}, Delhi air pollution and public health issues, Plastic waste management rules, Bhopal gas tragedy, etc	6
	Total	**18**

Text Books/Suggested Readings:

S. No.	Name of Authors/Books/Publishers	Year of Publication/ Reprint
1.	Raven, P.H, Hassenzahl, D.M., Hager, M.C, Gift, N.Y., and Berg, L.R. Environment, 8th Edition. Wiley Publishing, USA.	2015
2.	Singh, J.S., Singh, S.P., and Gupta, S.R. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.	2017
3.	Brusseau, M.L., Pepper, I.L. and Gerba, C.P. Environmental and Pollution Science, 3rd Edition. Academic Press, USA.	2019
4.	Carson, R. Silent Spring. Houghton Mifflin Harcourt, USA. Pp. 1-264.	2002

	Paper Components		
Credits	**Lecture (L)**	**Tutorial (T)**	**Practical (P)**

2	**1**	**-**	**1**
Assessment Scheme			
S.No.	**Component**	**Marking Scheme**	**Total Marks**
1	Internal Assessment • Assignment/Quiz/Project/ Presentation • Class Test • Attendance	 4 4 2	**10**
2.	Continuous Assessment (**Tutorial)** • Activity 1 • Activity 2 • Attendance		NA
3.	Practical • Continuous Assessment • End Term Written/Practical Exam • Viva	 40 (4 activities , 10 marks each)	40
4.	End Semester Examination		30