



जे. सी. बोस विज्ञान एवं प्रौद्योगिकी विश्वविद्यालय, वाए.एम.सी.ए, फरीदाबाद

J.C. BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY, YMCA

SECTOR -6, MATHURA ROAD, FARIDABAD, HARYANA-121006

(Established vide Haryana State Legislative Act No. 21 of 2009)

'A+' GRADE NAAC Accredited

DEPARTMENT OF ENVIRONMENTAL SCIENCES

LESSON PLAN

Name of the Faculty: Dr. Somvir Bajar
Discipline & Semester: M.Sc. (Environmental Sciences)
Subject: Natural Resource Management
Lesson plan duration: 15 weeks

Department: Environmental Sciences
Semester/Year: III/ II
Subject Code: ESP-217-V
Academic Year: 2025-26

Topic No.	Topic to be covered	Teaching Aids	No. of Lect/ Hrs Required	Text/ Ref. Books	CO Mapping
UNIT-1: FOREST RESOURCES					
1	Natural resources: Concept	BB & PPT	1	R1, R4	CO1
2	Classification of Natural Resources-I	BB & PPT	2	R1, R4	CO1
3	Natural Resource Degradation	BB, PPT & Case Study	1	R1, R4, R6	CO1
4	Natural Resource Conservation	BB, PPT & Case Study	1	R1, R4, R6	CO1
5	Impacts of Resource depletion on environment	PPT & Discussion	2	R1, R6	CO1
6	Forest Resources: Forest cover	BB & PPT	1	R5, R9	CO1
7	Classification and types of forest in India	BB & PPT	1	R5, R9	CO1
8	Importance and values of forest resources	BB & PPT	2	R5	CO1, CO2
9	Use and over-exploitation of Natural Resources	PPT & Case Study	1	R4, R5	CO1, CO2
10	Deforestation: cause and effects	PPT & Case Study	1	R4, R5	CO1, CO2
11	Forestry programme: Social Forestry	BB, PPT, E-Resources	1	R5, R6	CO2
12	Urban Forestry	BB, PPT, E-Resources	1	R5, R6	CO2
UNIT-2: WATER AND MARINE RESOURCES					
13	Water Resources: Surface problems	BB & PPT	1	R3, R4	CO2
14	Water Resources: Groundwater problems	BB & PPT	1	R3, R4	CO2
15	Water Logging	BB & PPT	1	R3, R4	CO2
16	Salinity	BB & PPT	1	R3, R4	CO2
17	Water Conservation and Management techniques: An Overview	BB & PPT	1	R3, R4	CO2, CO4
18	Rainwater Harvesting	BB & PPT	1	R3, R4	CO2, CO4
19	Watershed Management	BB & PPT	1	R3, R4	CO2, CO4
20	National River Action Plans	PPT, Discussion	1	R3, R9	CO2
21	Ganga Action Plan	PPT, Discussion	1	R3, R9	CO2
22	Yamuna Action Plan	PPT, Discussion	1	R3, R9	CO2
23	Marine resources: Introduction and Importance	PPT	2	R2, R6	CO1
24	Deep sea mineral resources: Exploration prospective	PPT & Discussion	1	R2, R9	CO3
25	Deep sea mineral resources: Challenges towards exploration	PPT & Discussion	2	R2, R9	CO3
26	Environmental impacts and sustainability of deep-sea mining	PPT, Case Study	2	R2, R6	CO3, CO4
UNIT-3: LAND AND MINERAL RESOURCES					
27	Land degradation: Loss of soil fertility	BB, PPT	1	R1, R10	CO1
28	Salinization	BB, PPT	1	R1, R10	CO1
29	Waterlogging	BB, PPT	1	R1, R10	CO1
30	Soil Conservation Methods: Wasteland reclamation-I	PPT, Video, Field Eg	1	R1, R6	CO2
31	Organic Farming	PPT, Video, Field Eg	1	R1, R6	CO2
32	Green Manuring	PPT, Video, Field Eg	1	R1, R6	CO2
33	Wetland: Definition, classification	PPT & Discussion	1	R6, R7	CO2, CO3
34	Functions of Wetlands	PPT & Discussion	1	R6, R7	CO2, CO3
35	Ecological importance and conservation of wetlands	PPT & Discussion	1	R6, R7	CO2, CO3
36	Mineral resources of India: Use and exploitation	BB, PPT	2	R4, R9	CO3

37	Mineral exploration and extraction	PPT, E-tutoring	2	R4, R9	C04
38	Environmental Impacts of Extraction	PPT, Case Study	2	R4, R9	C03, C04
UNIT-4: BIORESOURCES					
39	Definition, Types and significance of biodiversity,	BB & PPT	2	R8, R6	C01
40	Values and threats of Biodiversity	PPT, Discussion	2	R8, R6	C02
41	Biodiversity Conservation Strategies	BB, PPT	2	R8, R6	C02, C03
42	Bioprospecting	PPT, Case Study	1	R8	C03
43	Biopiracy	PPT, Case Study	1	R8	C03
44	REDD+: Mechanism – objectives and framework;	PPT, E-Resources	2	R6, R7	C03, C04
45	Conventions and Protocols	PPT	1	R6, R8	C03
46	Wildlife Resources and Conservation measures	BB, PPT	2	R6, R8	C02, C03
Total Hours / Lectures			60		

Pre-requisite:

Basic understanding of environmental science, ecology, and sustainability concepts.

Mode of Teaching:

Blackboard (BB), PowerPoint Presentations (PPT), Discussion, Case Studies, E-tutoring, Online Resources, Demonstrations, and Field-based Illustrations.

LMS/ICT Tools:

Digital Classrooms, DLMS, ZOOM, G-Suite, MS PowerPoint, SWAYAM, YouTube Academic Channels, and Online Resources (IUCN, MoEFCC, CBD, ENVIS).

Prepared by:

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Assistant Professor

Department of Environmental Sciences

Approved by:

Chairperson

Department of Environmental Sciences

M.Sc. ENVIRONMENTAL SCIENCES - SEMESTER III

Course Name: - Natural Resource Management

Course Code: - ESP-217-V

Type of Course: - Theory

Maximum Credits: - 4

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SESSIONAL	: 25
FINAL EXAM	: 75
TOTAL	: 100

NOTE: Question paper will have two parts. Part-1 will be compulsory and have 10 questions of equal marks covering the entire syllabus. Attempt any four questions out of six from Part-2.

COURSE OBJECTIVE:

The objective of this course is to provide an in-depth understanding of sustainable resource management principles. It examines conservation strategies for water, soil, forests, and biodiversity while assessing the role of policies and regulations in resource management. The course also explores emerging technologies for sustainable resource utilization and long-term environmental conservation.

UNIT-I: FOREST RESOURCES

Natural Resources: Concept and classification of natural resources; Natural resource degradation and conservation; Impacts of resource depletion on environment.

Forest Resources: Forest cover, classification and types of forest in India; Importance and values of forest resources; Use and over-exploitation, Deforestation: cause and effects; Forestry programme: Social Forestry, Urban Forestry

UNIT-II: WATER AND MARINE RESOURCES

Water Resources: Surface and Groundwater problems; Water logging and salinity; Water conservation and management techniques: Rain water harvesting, Watershed management, River action plans

Marine Resources: Introduction to Marine resources; Deep Sea mineral resources: Exploration prospective, challenges and environmental impacts; Sustainable deep sea mining

UNIT-III: LAND AND MINERAL RESOURCES

Land resources: Land degradation; Loss of soil fertility, Salinization and waterlogging; Soil Conservation Methods: Wasteland reclamation, Organic farming, Green manuring; Wetland: Definition, classification, functions, ecological importance and conservation.

Mineral resources: Mineral resources of India: Use and exploitation; Mineral exploration and extraction; Environmental impacts of extraction

UNIT-IV: BIORESOURCES

Definition, types and significance of biodiversity; Values and threats; Biodiversity conservation strategies; Bioprospecting and biopiracy; REDD+; Conventions and protocols; Wildlife resources and their conservation measures

COURSE OUTCOMES:

At the completion of this course, the learner will be able to:

CO1: Explain the significance and challenges of natural resource management.

CO2: Analyze conservation techniques for various natural resources.

CO3: Evaluate policy frameworks governing resource management.

CO4: Assess sustainable technologies for resource utilization.

REFERENCE BOOKS:

1. Anderson, D. A. (2013). *Environmental economics and natural resource management*. Routledge.
2. Beckman, D. (2012). *Marine environmental biology and conservation*. Jones & Bartlett Publishers.
3. Grigg, N. S. (2009). *Water resources management: principles, regulations, and cases* (No. 631.7 G72). New York: McGraw-Hill.
4. Kudrow, N. J. (2009). *Conservation of Natural Resources*. Nova Science Publishers, Incorporated.
5. Kumar, H. D. (2001). *Forest Resources: Conservation and Management*. Affiliated East-West Press.
6. Lynch, D. R. (2009). *Sustainable natural resource management: For scientists and engineers*. Cambridge University Press.
7. Peacock, K. W. (2008). *Natural resources and sustainable development*. Infobase Publishing.
8. Primack, R. B. (2002). *Essentials of conservation biology*. 5th ed. Sunderland: Sinauer Associates
9. Sampson, R. N. (2010). *Natural resources for the 21st century*. Island Press.
10. Singh, G., & Ahuja, V. (1992). *Land resource management: a case study of Goa*. Land resource management: a case study of Goa.

SUGGESTED WEB SOURCES:

1. http://envis.nic.in/ENVIS_html/ENVISSubject/subject.html
2. <https://www.iucn.org/>
3. <https://www.cbd.int/>
4. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=14>
5. <http://moef.gov.in/en/#>

MODE OF TRANSACTION:

Lecture, Demonstration, PowerPoint presentation, E-tutoring, Discussion, Assignments, Case study

LMS/ICT TOOLS: Digital Classrooms, DLMS, ZOOM, G-Suite, MS Power-Point, Online Resources