Gyanmanjari Innovative University

Syllabus
Gyanmanjari Diploma Engineering College
Semester-2 (Diploma)

Subject: Environment and Sustainable Future - DET1XX10109
Type of course: Value Added Course
Prerequisite: Basic knowledge of environment and ecology.
Rationale: To inculcate the environmental values translating into pro-conservation actions. Honorable Supreme Court of India has made it mandatory to introduce a basic course on environment at the undergraduate level.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks		Total Marks
CI	T	P	C	SEE	CCE	
2	0	0	2	100	50	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Course Content:

<table>
<tr><th>Unit No.</th><th>Course content</th><th>Hrs.</th><th>% Weightage</th></tr>
<tr><td>1</td><td>Module -1
Environment and Ecosystem
Definition, scope and importance, Need for public awareness. Ecosystems: Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Food chains, food webs and ecological pyramids.
Examination Style:
<table>
<tr><th>Sr. No.</th><th>Evolution Methods</th><th>SEE</th><th>CCE</th></tr>
<tr><td>1.</td><td>Food Web Puzzle & Pyramid Building</td><td>10</td><td></td></tr>
<tr><td>2.</td><td>Quiz –(ALA-1)</td><td></td><td>10</td></tr>
</table></td><td>T:6</td><td>20%</td></tr>
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3.	Documentary Review	10	
Total		**20**	**10**

1. Food Web Puzzle & Pyramid Building" (10 Marks)
Objective: Understand inter connectedness of species and trophic levels
Activity: Faculty will provide images or cards of various species. Students connect them into food chains and webs. Then construct an ecological pyramid and mark biomass or energy at each level.
2. Quiz (10Marks)
MCQ will be provided from the unit. 1 mark for each correct answer.
3. Documentary Review (10 Marks)
A documentary will be suggested by the faculty and will be reviewed (Minimum 300 Words) by the student.

2 **Module -2**

Social Issues and the Environment

From Unsustainable to Sustainable development. Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people: its problems and concerns. Case studies.

Examination Style:

Sr. No.	Evolution Methods	SEE	CCE
1	Field Visit Report–(ALA-2)		10
2.	Case Study Report	10	
3.	Short note on natural resources	10	
TOTAL		20	10

Activity No. 1 Field Visit Report / Virtual Field Study (10 Marks)

- A local dam site or mining area
- A community practicing rainwater harvesting.

Then ask students to write a report answering:

- What are the environmental concerns?
- What are the socio-economic implications?

Activity No. 2.- Case Study Report (10 Marks)

- **Task:** Faculty will assign students one of the following real-life problems.
- Rain water harvesting,
- Watershed management.
- Other

Activity No.3. Short note on Urban Problem related to Energy (10 Marks)

T:6 20%

3	**Module -3:** **Environmental Pollution** **Definition, Causes, effects and control measures of:** (a) Air pollution (b) Water pollution (c) Soil pollution (d) Noise pollution (e) Marine pollution **Examination Style:** **1. ALA-Pollution Diary / Journal Activity (10 Marks)** **Objective:** Reflect on personal environmental footprint **Task:** Keep a 3-day journal of personal pollution contribution (plastic use, travel emissions, noise, etc.)Reflect on what changes can be made. **Deliverable:** Diary entry summary + action plan **2. Watch and Respond (20 marks** Show the students one of the following short educational videos (10–15 minutes) on the topic of pollution (select based on the chapter). Students must watch the video carefully and answer the questions below in their answer sheet. No notes allowed during watching.	T:6	20%

Sr. No.	Evolution Methods	SEE	CCE
1.	Pollution Diary / Journal Activity—(ALA-3)		10
2.	Watch and Respond	20	
Total		20	10

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Module -4
Bio-diversity and its Conservation
Introduction, Definition: genetic, species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. India as a mega-diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity
Case study - Gir forest Gujarat conservation of Asiatic lions
Examination Style:
<table>
<tr><th>Sr. No.</th><th>Evolution Methods</th><th>SEE</th><th>CCE</th></tr>
<tr><td>1.</td><td>Situation given by faculty: Should Zoos Exist? –(ALA-4)</td><td></td><td>10</td></tr>
<tr><td>2.</td><td>Biodiversity Hotspots of India” – Mapping</td><td>10</td><td></td></tr>
<tr><td>3.</td><td>From Roots to Rights: A Biodiversity Appeal</td><td>10</td><td></td></tr>
<tr><td colspan="2">Total</td><td>20</td><td>10</td></tr>
</table>
Activity No. 1.ALA- Role-play/Debate: Should Zoos Exist? (10 Marks)
Objective: Understand ex-situ vs in-situ conservation
Task: Divide students into two groups: Pro-Zoo (ex-situ) vs Anti-Zoo (prefer in-situ)include points on ethics, conservation success, animal rights
Deliverable: Debate summary and one-page position paper
Activity No. 2. Hotspots of India – Mapping (10 Marks)
Objective: Understand India’s rich biodiversity
Task: Ca biodiversity hotspot map of India
Ex. Western Ghats, Himalayas, Indo-Burma region, Sundaland.
Activity No. 3. From Roots to Rights: A Biodiversity Appeal
Task Description: (10 Marks)
Write a persuasive letter titled “Roots to Rights: A Biodiversity Appeal”
You may address it to:

A Government Environmental Authority
A Member of Parliament
The General Public or Media

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<td>20%</td>
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<td>5</td>
<td>Module -5: Environmental issues
Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.</td>
<td>T:6</td>
<td>20</td>
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Case studies: In Nuclear holocaust in Japan 1945

Examination Style:

Sr. No.	Evolution Methods	SEE	CCE
1	Why Did It Happen?" Forensic Report Activity	10	
2	Role as a Green Advocate (Speech)	10	
3.	Acid Rain in a Jar– (ALA-5)		10
Total marks		20	10

Activity: 1. "Why Did It Happen?" Forensic Report Activity (10 Marks)

Task: Given an environmental disaster (e.g., acid rain or nuclear leak etc.), students write a forensic-style report:

- What caused it?
- Which laws were violated or missing?
- Recommendations to prevent future incidents

Evaluation Focus: Cause-effect analysis, scientific reasoning, understanding of legal gaps.

Activity: 2. Role as a Green Advocate (Speech Competition) (10 Marks)

Prompt: If I were the Environment Minister of India. Students present what laws they would create, strengthen, or reform.

Evaluation Focus: Vision, legal knowledge, leadership thinking

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	20%	10%	20%	30%	10 %	10%

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be able to:	
CO1	Understand of key environmental concepts and ecosystem.

CO2	Analyze urban environmental problems related to energy, including energy demand, resource depletion, and the need for renewable and efficient energy systems.
CO3	Evaluate pollution control strategies and propose sustainable practices to minimize environmental hazards and promote cleaner technologies.
CO4	Recognize India's status as a mega -Diversity nation, and identify major biodiversity hotspots and their significance.
CO5	Identify and analyze environmental problems, such as climate change, Global warming and Acid rain.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

1. Perspectives in Environmental studies
2. Environmental studies by Dr. D.L. Manjunath, Pearson Education-2006
3. Environmental studies by R. Rajagopalan, Oxford Publication-2005
4. Principles of Environmental Science by Curnningham. W.P. & Cunningham M.A,TataMcGraw Hill Publishing Co. Ltd., New Delhi.
5. Textbook of Environment & Ecology by Deeksha Dave and S.S. Katewa,Cengage Learning India Pvt. Ltd., Patparganj, Delhi, 2009
6. Environmental studies by Benny Joseph, Tata MCgraw-Hill-2005

Suggested Rubrics:

Suggested Assessment guidelines	
Module 1	MODULE 1 Activity 1: Food Web Puzzle & Ecological Pyramid Building – 10 Marks Criteria — Marks Correct formation of food chains and proper linking into a food web (interconnectedness & accuracy) — 5 Marks

	Construction of ecological pyramid with correct trophic levels, labeling of energy/biomass	4 Marks
	Overall clarity, correctness & presentation	1 Mark
	Total	10 Marks
	Activity 2: Quiz (MCQ-Based) – 10 Marks	
	Criteria	Marks
	Conceptual accuracy demonstrated through MCQ responses	5 Marks
	Application and understanding of syllabus concepts	3 Marks
	Overall performance consistency & correctness	2 Marks
	Total	10 Marks
	Activity 3: Documentary Review – 10 Marks	
	Criteria	Marks
	Understanding of documentary theme and key ecological issues	4 Marks
	Integration of ecological concepts with examples	3 Marks
	Critical analysis, personal reflection & learning outcome	2 Marks
	Organization, language & word limit	1 Mark
	Total	10 Marks
MODULE 2	Activity 1: Field Visit Report / Virtual Field Study – 10 Marks	
	Criteria	Marks
	Description of study area with clarity of objectives	4 Marks
	Identification and explanation of environmental concerns	4 Marks
	Socio-economic implications, conclusion & presentation	2 Marks
	Total	10 Marks
	Activity 2: ALA – Case Study Report – 10 Marks	
	Criteria	Marks
	Understanding of the environmental problem and context	4 Marks
	Case analysis, discussion of challenges & solutions	4 Marks
	Feasibility of suggestions, conclusion & clarity	2 Marks
	Total	10 Marks
	Activity 3: Short Note on Urban Energy Problem – 10 Marks	
	Criteria	Marks
	Identification and explanation of urban energy problems	4 Marks
	Causes, impacts & consequences explained logically	4 Marks
	Solutions, sustainability perspective & presentation	2 Marks
	Total	10 Marks

MODULE 3	MODULE 3 Activity 1: ALA – Pollution Diary / Journal Activity – 10 Marks Criteria Marks Completion of diary and identification of pollution sources 5 Marks Reflection, self-analysis & environmental awareness 3 Marks Practical and realistic action plan for reduction 2 Marks Total 10 Marks Activity 2: Watch and Respond – 20 Marks Criteria Marks Summary of main idea with clarity (4–5 sentences) 5 Marks Identification of causes/sources of pollution 4 Marks Explanation of harmful effects on humans/environment 6 Marks Solutions or preventive measures suggested 5 Marks Total 20 Marks
MODULE 4	Activity 1: ALA – Role-Play / Debate "Should Zoos Exist?" – 10 Marks Criteria Marks Understanding of conservation concepts (ex-situ vs in-situ) 4 Marks Ethical, ecological & animal-rights arguments 4 Marks Quality of participation, debate summary & position paper 2 Marks Total 10 Marks Activity 2: Hotspots of India – Mapping – 10 Marks Criteria Marks Correct location, marking & labeling of biodiversity hotspots 5 Marks Description of significance and biodiversity value 3 Marks Neatness, legend & map presentation 2 Marks Total 10 Marks Activity 3: "From Roots to Rights: A Biodiversity Appeal" – 10 Marks Criteria Marks Relevance and clarity of biodiversity issues & threats 4 Marks Persuasive arguments with emotional and ethical appeal 4 Marks Scientific accuracy, structure & presentation 2 Marks Total 10 Marks
MODULE 5	Activity 1: "Why Did It Happen?" – Forensic Report – 10 Marks Criteria Marks Identification and explanation of causes with cause–effect analysis 5 Marks

	Analysis of violated/missing environmental laws	3 Marks
	Preventive recommendations, clarity & reasoning	2 Marks
	Total	10 Marks
	Activity 2: Role as a Green Advocate – Speech Competition – 10 Marks	
	Criteria	Marks
	Vision, originality & sustainability-oriented ideas	4 Marks
	Understanding of environmental laws & policies	3 Marks
	Persuasiveness, communication skills & confidence	3 Marks
	Total	10 Marks