LJ University

University with a Difference

Diploma in Cloud Computing and Big Data

Course Code: 025100204

Environmental Studies

Programme / Branch Name			Diploma in Cloud Computing and Big Data			
Course Name	Environmental Studies				**Course Code**	025100204
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses BSC: Basic Science Courses
ESC: Engineering Science Courses PCC: Program Core Courses
OEC: Open Elective Courses PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

Teaching Hours / Week / Credits				Evaluation Scheme			
L	**T**	**P**	**Total Credit**	**CCE**	**SEE (Th)**	**SEE (Pr)**	**TOTAL**
0	0	2	1	50	-	50	100

Legends:
L: Lectures T: Tutorial P: Practical
CCE: Continuous & Comprehensive Evaluation
SEE (Th): Semester End Evaluation (Theory)
SEE (Pr): Semester End Evaluation (Practical)

2. Prerequisites

- ✓ Interest in natural systems sustaining the life on the earth. Basic understanding of primary and secondary level science subjects. Basic understandings of Electronics terminology and laws. Current awareness about the Environment of earth.

3. Rationale

- ✓ To inculcate the environmental values translating into pro-conservation actions. For a country to progress, sustainable development is one of the key factors. Environment Conservation and Hazard Management is of much importance to every citizen of India. The country has suffered a lot due to various natural disasters. A considerable amount of energy is being wasted. Energy saved is energy produced. Environmental pollution is on the rise due to rampant industrial mismanagement and indiscipline. Renewable energy is one of the answers to the energy crisis and also to reduce environmental pollution. Therefore, this course has been designed to develop a general awareness of these and related issues so that every student will start acting as a responsible citizen to make the country and the world a better place to live in.

4. Objectives

- ✓ To create and disseminate knowledge to the students about environmental problems on a local, regional, and global scale.
- ✓ To sensitize students towards environmental concerns and issues and make them able to apply their knowledge for sustainable development.
- ✓ To provide intensive practical training on modern instrumentation and analytical techniques for environmental analyses.
- ✓ To orient the students towards efficient environmental decision-making and management.
- ✓ To develop understanding of the impacts of climate change and related mitigation strategies.

5. Contents

Unit No.	Unit Name	Topics	Learning Outcome	% Weightage	Hours
1.	**Ecology and Environment**	1.1. Importance of Environment and Scope 1.2. Engineering and Environment Issues 1.3. The Natural System, Biotic and Abiotic Components and Processes of Natural System 1.4. Eco system, Food Chain and Webs and Other 1.5. Biological Systems 1.6. Causes of Environmental Pollution 1.7. Pollution due to Solid Waste 1.8. Water Pollution, Air Pollution, the Noise as Pollution 1.9. Pollution of Land due to Industrial and Chemical Waste 1.10. Radiation and Its Effects on Vegetables and Animals	• Enhance Knowledge About Engineering Aspects of Environment • Causes of Environmental Pollution • State the Major Causes of Air, Water and Noise Pollution • Describe How Industrial Waste Contaminates the Land • Effects of Radiation	18	05
2.	**Sustainable Development and Waste Management**	2.1. Concept of Sustainable Development 2.2. Natural Resources, Biotic and Biotic Resources 2.3. Principles of Conservation of Energy & Management 2.4. Need of Renewable Energy 2.5. Growth of Renewable Energy in India and the World 2.6. Concept of Waste Management and Recycling	• Explain the Concept of Sustainable Development • Describe the Growth of Renewable Energy in India • Waste Management and Methods of Recycling	18	05

3.	**Renewable Energy Sources**	3.1. Introduction to Renewable Energy Sources 3.2. Different Types of Renewable Energy Sources 3.3. Concept of Biomass Energy and Its Application 3.4. Concept of Tidal Energy 3.5. Concept of Geo-thermal Energy 3.6. Concept of Hydro Power Plant	• Perceive Basic Understanding About Various Renewable Energy Sources, Its Types and Applications	18	05
4.	**Wind and Solar Energy**	4.1. Growth of Wind Power in India 4.2. Types of Wind Turbines: Vertical Axis Wind Turbines (VAWT) and Horizontal Axis Wind Turbines (HAWT) 4.3. Types of HAWTs – Drag and Lift Types 4.4. Working of Large Wind Turbines Features of Solar Thermal and PV Systems 4.5. Types of Solar Cookers and Solar Water Heaters 4.6. Solar PV Systems and Its Components and their Working	• Describe the Growth of Wind Power in India • State the Differences Between VAWTs and HAWTs • Working of Large Wind Turbines • Describe the Salient Features of Solar Thermal and PV Systems • Describe a Solar Cooker and Solar Water Heater	32	09
5.	**Disaster Management**	5.1. Features of Disasters such as Floods, Earthquakes, Fires, Epidemics, Gas / Radioactive leaks etc. 5.2. Management and Mitigation of Above Disasters	• State the Appropriate Actions to be taken During Disasters	14	04
				Total Hours	**28**

6. List of Practicals / Exercises

Sr. No	Name of Activity	Key Competency
1.	Plantation Activity	• Awareness & Importance about Forestation
2.	Visit Based on Awareness about Ecology & Environment	• Study of Simple Ecosystems-Pond, River, Hill Slopes, etc
3.	Visit Based on Awareness about Renewable Energy Sources	• Solar Power Plants, Wind Energy Plants, Biogas Plants
4.	Poster / Model Making Activity One Day Celebration on Environmental Activities	• Graphical Representation of Ideas & Concepts about Environment
5.	Social Awareness Campaign for Protection of Environment	• Visit to a Local Polluted Site- Urban / Rural / Industrial / Agricultural Site
6.	Describe the Environmental Problem of Your Locality and Suggest a Remedy.	• Ability to Solve the Common Environmental Problems

7. Suggested Specification Table for Evaluation Scheme

Unit No.	Unit Name	Distribution of Topics According to Bloom's Taxonomy					
		R %	U %	App %	C %	E %	An %
1.	Ecology and Environment	12	18	23	23	12	12
2.	Sustainable Development and Waste Management	11	21	26	16	16	10
3.	Renewable Energy Sources	15	20	20	15	20	10
4.	Wind and Solar Energy	17	17	23	13	13	17
5.	Disaster Management	14	28	14	14	15	15

Legends: R: Remembering U: Understanding
App: Applying C: Creating
E: Evaluating An: Analyzing

8. Textbooks

1) Ecology and Control of the Natural Environment, Izrael, Y.A., Kluwer Academic Publisher
2) Environmental Studies, Anandita Basak, Pearson

9. Reference Books

1) Engineering and Environment, Edward S. Rubin, Mc Graw Hill Publications
2) Renewable Energy Technologies, Solanki, Chetan Singh, PHI Learning, New Delhi
3) Ecology and Control of the Natural Environment, Izrael, Y.A., Kluwer Academic Publisher
4) Environment Engineering and Disaster Management, Sharma, Sanjay K., Luxmi Publications, New Delhi
5) Environmental Noise Pollution and Its Control, Chhatwal, G.R.; Katyal, T.; Katyal, Anmol Publications, New Delhi
6) Wind Power Plants and Project Development, Earnest, Joshua & Wizelius, Tore, PHI Learning, New Delhi
7) Renewable Energy Sources and Emerging Technologies, Kothari, D.P. Singal, K.C., Ranjan, Rakesh, PHI Learning, New Delhi
8) Environmental Studies, Anandita Basak, Pearson
9) Environmental Science and Engineering, Alka Debi, University Press

10. Open Sources (Website, Video, Movie)

1) http://www1.eere.energy.gov/wind/wind_animation.html
2) http://www.nrel.gov/learning/re_solar.html
3) http://www.nrel.gov/learning/re_biomass.html
4) http://www.mnre.gov.in/schemes/grid-connected/solar-thermal-2/
5) http://www.mnre.gov.in/schemes/grid-connected/biomass-powercogen/
6) https://www.youtube.com/playlist?list=PLSQj2zZx2Kxd-zuw-N9oCK5AHYjA5eQjp/
7) https://ljku.edu.in/