FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2020-21

Programme: **Bachelor of Engineering (Information Technology)**

Semester: **II**

Course Code: **102001207**

Course Title: **Energy and Environment Science**

Course Group: **Basic Science Courses**

Course Objectives: The objectives of this course are to introduce the basics of environment & ecosystem, different sources of pollution, its control measures and various energy resources & its management. The course gives awareness about global environmental issues and outlines the measures for sustainable development.

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
3	0	0	3	40 / 14	60/ 21	NA	NA	100 / 35

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Environment & Ecosystem:** Components of environment and their relationship, impact of technology on environment, environmental degradation. Structure and functions of an ecosystem, components of ecosystem –producers, consumers and decomposers, energy flow and productivity in the ecosystem, hydrological and bio-geo-chemical cycles, food chain, food web and ecological pyramids, biodiversity and ecosystem functions, biodiversity hotspots.	08
2	**Environmental Pollution:** Sources, effects and control measures of – air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution and radioactive pollution. Drinking water and waste water quality standards, ambient air and noise quality standards. Solid waste management – causes, effects and control measures of urban and industrial wastes, E-waste – sources and management, Biomedical waste – sources and management. Role of individuals and authorities in pollution control.	12

3	**Global Environmental Issues:** climate change, global warming, acid rain, ozone layer depletion	**04**
4	**Energy and its Uses:** Importance of energy resources, conventional and non conventional energy sources (solar energy, wind energy etc) and its uses, global and Indian scenario, Urban problems related to energy, environmental impact of energy production, energy and environment policy	**08**
5	**Sustainability and Environment:** Sustainable development, water conservation, rainwater harvesting, watershed management, waste land reclamation, environmental impact assessment (EIA), Environmental auditing, environmental protection Acts (Environment Protection Act, Air (Prevention and Control of Pollution) Act and water (Prevention and Control of Pollution) Act, introduction to ISO 14000, carbon footprint, cleaner development mechanism (CDM), concept of 4R's, Environmental ethics.	**08**
6	**Energy Management:** Earth's global energy balance, energy budget – past and present, energy conservation, energy efficiency and sustainable energy systems.	**05**
	TOTAL	**45**

Reference Books:

1	Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha Second edition,2013 Publisher: Universities Press (India) Private Ltd, Hyderabad.
2	Dr. Suresh K Damecha, Environmental Studies, S K Kataria & Sons, New Delhi.
3	R. Rajagopalan, Environmental Studies, Oxford University Press.
4	Benny Joseph, Environmental Studies, TMH publishers.
5	Wright Richard and Nebal Bernard, Environmental studies, Prentice Hall, New Jersey.
6	U K Khare, Basics of Environmental Studies, Tata McGrawHill
7	Robert A. Ristinen, Jack J. Kraushaar, Jeffrey Brack, Energy and the Environment, wiley Publication
8	Daniel B Botkin & Edward Akeller, Environmental Sciences, John Wiley & Sons

Supplementary learning Material:

1	NPTEL courses on Energy and Environment
2	www.iso.org/iso-14001-environmental-management
3	www.sciencedirect.com/topics/earth-and-planetary-sciences/energy-management
4	www.india.gov.in/official-website-ministry-environment-and-forests
5	Relevant videos to explain the contents of the syllabus

Pedagogy:

- Direct classroom teaching
- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Seminar/Poster Presentation

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
40%	40%	20%	0%	0%	0%	

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 Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	To comprehend components of environment and ecosystem and to get awareness about environmental degradation.	**20**
CO-2	To identify different types of pollutions and control measures.	**30**
CO-3	To create awareness about global environmental issues.	**10**
CO-4	To understand various energy sources and its related issues.	**15**
CO-5	To apply the concepts of sustainability on environment.	**15**
CO-6	To study energy budget and energy management options.	**10**

Curriculum Revision:	
Version:	1.0
Drafted on (Month-Year):	June-2020
Last Reviewed on (Month-Year):	-
Next Review on (Month-Year):	June-2025