



FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2025-26

Programme: Bachelor of Technology

Semester: I/II

Course Code: 102001219

Course Title: Environment and Sustainability

Course Group: Basic Science Course

Course Objectives: The objectives of this course are to introduce basic concepts of Environment, Ecosystem and to impart knowledge on causes and effects of Environmental pollution and Global environmental issues. The course gives awareness about Sustainability concepts and Life Cycle Analysis (LCA).

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Theory		J/V/P*		Total
				Internal	External	Internal	External	
3	0	0	3	50/18	50/18	NA	NA	100 / 36

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

Detailed Syllabus:

Sr.	Contents	Hours
1	Introduction to Environment: Basic Components (Biotic and Abiotic), Ecosystem, Food Chain, Food Web, Ecological Pyramids, Scope of Environment- Public awareness, Biodiversity and its conservation, Impact of technology on environment, Environmental degradation.	05
2	Environmental Pollution: Pollutants, Pollution, types of pollution, Sources, effects and control measures of – air pollution, water pollution, soil pollution, and noise pollution. Drinking Water Standards, Ambient Air and Noise Quality Standards. Solid waste management – types and disposal methods, E-waste – sources and management, Biomedical waste – sources and management. Environmental Legislation: Environmental protection Acts : Environment Protection Act, Air (Prevention and Control of Pollution) Act and Water (Prevention and Control of Pollution) Act.	12
3	Energy Resources: Growing energy needs Renewable and Non-renewable energy- Sources and Types, Energy management and conservation, Sustainable energy, Urban problems related to energy.	05



4	Global Environmental Issues: Climate Change- Factors affecting climate change, Impacts, and Mitigation, Global Warming-Causes, Effects and Process, Green House Effect, , Ozone Depletion, Acid Rain.	04
5	Sustainability Concepts and Life Cycle Analysis (LCA): Sustainability – Concept, Needs and Challenges, Sustainable Development Goals (SDGs’)- targets, indicators and intervention areas, Unsustainable to sustainable development, Water conservation, Concept of 4R’s, Sustainable habitat, Green sustainable materials, Sustainable engineering design principles, Environmental footprint, Circular economy. Life Cycle Analysis: Introduction, Framework, Phases of LCA, Key features of LCA, Methodology, Benefits, Life Cycle Inventory Analysis (LCI), Life Cycle Impact Assessment (LCIA) , IS/ISO 14040:2006 Environmental Management- Life Cycle Assessment – Principles and Framework, Case study	14

Reference Books:

1	Textbook of Environmental Studies for Undergraduate Courses by ErachBharucha 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	Prof. Brijeshkumar Dubey, Civil Engineering, IIT Kharagpur, Sustainable Engineering Concepts and Life Cycle Analysis
5	Singh, Ritu, Kumar, Sanjeev, Green Technologies and Environmental Sustainability, Springer International Publishing, 2017 , eBook ISBN 978-3-319-50654-8
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
9	Anandita Basak, Environmental Studies , Pearson Publications ,ISBN :8131785688

Supplementary learning Material:

1	NPTEL courses on Sustainable Engineering Concepts and Life Cycle Analysis: https://archive.nptel.ac.in/courses/105/105/105105157/
2	IS/ISO 14040:2006 Environmental Management- Life Cycle Assessment – Principles and Framework pdf.
3	www.iso.org/iso-14001-environmental-management
4	www.sciencedirect.com/topics/earth-and-planetary-sciences/energy-management
5	www.india.gov.in/official-website-ministry-environment-and-forests
6	Relevant videos to explain the contents of the syllabus
7	Environment Protection Act: https://www.indiacode.nic.in/bitstream/123456789/4316/1/ep_act_1986.pdf
8	Air (Prevention and Control of Pollution) Act: https://www.indiacode.nic.in/bitstream/123456789/9462/1/air_act-1981.pdf



9	Water (Prevention and Control of Pollution) Act https://www.indiacode.nic.in/bitstream/123456789/15429/1/the_water_%28prevention_and_control_of_pollution%29_act%2C_1974.pdf
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Pedagogy:

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

Internal Evaluation:

The internal evaluation comprised of written exam (40% weightage) along with combination of various components such as Certification courses, Assignments, Mini Project, Simulation, Model making, Case study, Group activity, Seminar, Poster Presentation, Unit test, Quiz, Class Participation, Attendance, Achievements etc. where individual component weightage should not exceed 20%.

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	
10%	30%	20%	10%	10%	20%	

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	Understand components of environment and ecosystem and to get awareness about environmental degradation.	20
CO-2	Impart knowledge on causes, effects and control of environmental pollution.	40
CO-3	Facilitate the understanding of energy resources and and global environmental issues.	10
CO-4	Inculcate the concepts of sustainability and Life Cycle Analysis.	30

Curriculum Revision:

Version:	1
Drafted on (Month-Year):	April - 2025
Last Reviewed on (Month-Year):	--
Next Review on (Month-Year):	April - 2028