



# GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering (Minor/Honours Degree Syllabus)

Subject Code : 115AS01

Subject Name : Environmental Engineering and Pollution Prevention for Sustainability

WEF Academic Year :	2022-23
Semester :	5
Category of the Course :	Compulsory

**Prerequisite :** Students should have clear idea about environment and its components and basics of pollution.

### Rationale :

This course focuses on classification of pollution, sources of pollutants and its mitigating techniques. Prevention of pollution is essential component of sustainability as understanding how waste is produced and how it can be minimized, or prevented, is the first step to reduce waste and protect the environment. Waste management, recycle and reduction equally contributes for sustainable development.

### Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
03	00	02	04	70	00	30	00	100

### Course Content :

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Basic concepts- biotic and abiotic environment, environmental acts and regulations, environment and public health, air quality standards, Environmental impact analysis	5	10
2	Water pollution - nature and types of water pollutants, organic and inorganic water pollutants	5	10
3	Water treatment- municipal sewage and industrial water treatment, Preliminary primary, secondary and tertiary treatment methods water reuse and recycling	5	10
4	Air pollution: Definition of pollutants, standards and limits of pollutants. Sources and sinks of pollutants. meteorology. Problems associated with dispersion. Sampling techniques. Control techniques for removal of particulate and gaseous pollutants applications	7	20
5	Global atmosphere- greenhouse gases, global warming, acid rain, ozone depletion and photochemical smog	5	15
6	Solid waste management- sources, characteristic, waste reduction and material recovery, hazardous waste management	7	15



# GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering (Minor/Honours Degree Syllabus)

Subject Code : 115AS01

Subject Name : Environmental Engineering and Pollution Prevention for Sustainability

7	Environmentally compatible materials, Design of unit operations for pollution prevention, Economics of pollution prevention, Process flow-sheet for pollution prevention, sustainable process design, life cycle analysis of plastics and paper	8	20
<b>Total</b>		<b>42</b>	

### Reference Books :

- 1) Introduction to environmental engineering - P. Aarne Vesilind- Cengage learning.
- 2) Environmental engineering - Joseph A. Salvato – wiley.
- 3) Unit operations and processes in environmental engineering- Tom D Reynolds – PWS Publishing.

### Course Outcome :

After Completion of the Course, Student will be able to :

Sr. No	Course Outcomes	RBT Level*
1	CO 1- Explain the sources of environmental pollution and their causes.	UN
2	CO 2 - Analyze advanced treatment methods and pollution abatement techniques for water pollution.	AN
3	CO 3 - Explain sources of air pollution and its control techniques.	AP
4	CO 4 - Summarize the techniques for solid waste management.	AP
5	CO 5 - Design and evaluation of environmental issues pertaining to industry and society.	EL

\*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

### Suggested Course Practical List :

- 1) Parameter determination of wastewater. (COD, BOD, DO etc.)
- 2) Determination of hardness and TDS of water.
- 3) Treatment of water to reduce hardness and TDS.
- 4) Decolorization of wastewater using adsorbent.
- 5) Analysis of air sample from stack.
- 6) Synthesis of bio-adsorbent or adsorbent from waste.

\*\*\*\*\*