GUJARAT TECHNOLOGICAL UNIVERSITY

CHEMICAL TECHNOLOGY (36)
GREEN CHEMISTRY FOR TECHNOLOGISTS
SUBJECT CODE: 2153611
B.E. 5th SEMESTER

Type of course: Chemical Technology.

Prerequisite: A good understanding of Chemistry and reaction mechanism

Rationale: This subject is intended to make students aware about the importance & advantages of Green Chemistry in the present scenario of industrial life.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks			Practical Marks			
				ESE (E)	PA (M)		ESE (V)		PA (I)	
					PA	ALA	ESE	OEP		
3	0	0	3	70	20	10	0	0	0	100

Content:

Sr. No	Topics	Teaching Hrs.	Module Weightage
1.	Introduction to Green Chemistry: Green Chemistry and its 12 principles. Concepts of green chemistry, waste prevention and minimization of waste generation	5	11
2.	Nature of Chemicals: Nature of Chemicals & world chemical scenario, prevention.	5	11
3	Safety: Atom economy, less hazardous chemical synthesis, designing safer chemicals, safer solvents & auxiliaries, inherently safer chemistry for accident prevention.	10	22
4	Design: Design for energy efficiency, design for degradation, and use of renewable feed stock, reduction of derivatives.	12	27
5	Catalysis: Catalysis, real time analysis for pollution prevention, Catalysis and green chemistry, solvent free systems, super critical fluids, ionic liquids, fluorous biphasic solvents, photochemical reactions and reactors, microwave and sono chemistry. Electrochemical reactions.	13	29

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
50%	**17%**	**12%**	**11%**	**10%**	**-**

Reference Books:

1) An Introduction to Green Chemistry Matlack A.S., Marcel Dekker, 2001
2) Green Chemistry: Theory and Practice, Anastas P.T. and Wavner J.C.; Oxford University Press, 1998
3) An Introductory Text on Green Chemistry, Lancaster M., Royal Society of Chemistry, Cambridge, 2002
4) Handbook of Green Chemistry and Technology, Clark J.H. and Macquaries, Blackwell Publishers, 2002

Course Outcome:

After learning the course the students should be able to

1. Properly understand classify safer chemicals & safe reactions.
2. Apply correctly the conservation principles of material, energy.
3. Designing of safer chemical reaction

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.