

GUJARAT TECHNOLOGICAL UNIVERSITY

ENVIRONMENT ENGINEERING CHEMICAL ENGINEERING PROCESSES

SUBJECT CODE: 2131304

B.E. 3RD SEMESTER

Type of course: Applied Science

Prerequisite: None

Rationale: In order to combat the problem of industrial pollution the first step is to understand the various chemical processes taking place in an industry. More over it will be possible to identify the sources from which pollutants are originating and their probable characteristics.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks			Practical Marks			
			ESE (E)	PA (M)		PA (V)		PA (I)		
PA	ALA	ESE		OEP						
3	2	0	5	70	20	10	30	0	20	150

Content:

Sr. No.	COURSE CONTENT	Total Hrs	% Weightage
1	Nitrification : Manufacturing process of Nitric Acid, process flow diagram, Sources of pollution, health & safety	04	9
2	Amination by Reduction Aniline:- Manufacturing process , flow diagram ,Sources of pollution, health & safety	04	9
3	Halogenation Monochloroacetic Acid, Ethylene Chloro hydrin, Vinyl Chloride:- Manufacturing process,process flow diagram ,Sources of pollution, health & safety.	08	20
4	Sulfonation and sulfation. Ethanol from Ethylene:- Manufacturing process ,process flow diagram ,Sources of pollution, health & safety.	04	9
5	Amination by ammonolysis. Hydrogen cyanide and Urea:- Manufacturing process ,process flow diagram ,Sources of pollution, health & safety	06	14
6	Oxidation:- Acetic Acid:- Manufacturing process, process flow diagram ,Sources of pollution, health & safety.	04	9
7	Hydrogenation:- Hydrogenation of cotton seed oil:- Manufacturing process ,process flow diagram ,Sources of pollution, health & safety, Methanol from carbon monoxide and hydrogen.	04	10
8	Esterification:- Ethyl Acetate, Vinyl Acetate and Cellulose Acetate:-Manufacturing	04	10

	process ,process flow diagram ,Sources of pollution, health & safety		
9	Hydrolysis:- Furfural, Ethanol and Phenol:- Manufacturing process ,process flow diagram ,Sources of pollution, health & safety.	04	10

Reference Books:

1. Unit Processes and Organic Synthesis by P.H. Groggins
2. Chemical Engineering Processes by Dryden
3. Chemical Plant Technology by Shreeves

Course Outcome:

After learning the course the students should be able to:

1. Identify the chemical engineering unit processes.
2. Identify the sources of pollution from different manufacturing processes.
3. Assess the pollution potential from the chemical manufacturing processes.

List of Open Source Software/learning website: NPTEL

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.