

**Subject Code: 01CH0252****Subject Name: Chemical Technology-II****B.Tech. Year - II**

**Objective:** To study the various manufacturing processes involved in production of various daily use chemicals and materials of Organic & Inorganic in nature.

**Credits Earned:** 5 Credits

**Course Outcomes:** After completion of this course, student will be able to:

1. To build a basic knowledge of the process carried out in chemical industry.
2. To review the practical importance and relevance of process takes place in chemical industry.
3. To be able to utilize the technological methods in problem solving in process plant.
4. To study about the salient features of the processes.
5. To build a bridge between theoretical and practical concepts used in industry.

**Pre-requisite of course:** Basic Chemistry & Chemical Technology-I

**Teaching and Examination Scheme**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	CSE	Internal (I)	Viva (V)	Term work (TW)	
4	0	2	5	50	20	30	25	25	150



**Contents:**

<b>Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>Dyes &amp; Intermediates</b>  Introduction, Classification, application of dyes, Azo dyes, Anthroquinone dyes, Triamyl dyes, dispersed dyes, Miscellaneous dyes: azine, thiazines, oxazines, thiazoles, nitro dyes. Various dye intermediates and their manufacturing, manufacturing of H-acid, Koch acid, Vinyl sulphone, Wet dyes, Nitro benzene, Chrome blue black.	14
2	<b>Drugs &amp; Pharmaceuticals</b>  Introduction to drugs & their classification, Introduction to Antibiotics such as penicillin, erythromycin, streptomycin, Manufacturing of Aspirin, Barbitol & Phenol Barbitol, Vitamin-C, Insulin, Ascorbic acid.	12
3	<b>Fermentation Industries</b>  Manufacturing of beers, wines, Industrial alcohol, absolute alcohol, Manufacturing process of Citric acid & Butyl alcohol by Fermentation.	6
4	<b>Sugars, Paints, Pigments</b>  Manufacturing process of Sugar, Paints, manufacturing of various color pigments such as blue, red, yellow, white, green, brown. Industrial Coatings, Varnishes, Polishes, printing inks.	6
5	<b>Synthesis of Organic Materials</b>  Aromatic Compounds: Benzene, Toluene, Xylene, Naphthalene. Plastics: Thermoplastics & Thermosetting plastics, Polyethylene, Polypropylene. Resins: Phenolic & Epoxy Resins. Polymers: Polyamides, Polyesters, Acrylics. Rubber: Natural & Synthetic Rubber Production	8
	<b>Total Hours</b>	<b>46</b>



**References:**

1. Shreve's Chemical Process Industries”, George T. Austin, McGraw Hill Publication, 5<sup>th</sup> edition
2. “DRYDENS outlines of chemical technology for the 21st century”, M Gopal Rao & Marshal Sittig, pub East-West Press, 3<sup>rd</sup> edition
3. “Unit Processes in Organic Synthesis”, P.H. Groggins, Tata McGraw Hill Publications.

**Suggested Theory distribution:**

The suggested theory distribution as per Bloom’s taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
25%	35%	20%	15%	5%	-

**List of Experiments:**

- 1) Synthesis of Aspirin from Salicylic Acid
- 2) To determine % of Vitamin C in the given Tablet.
- 3) Estimation of Sulphamethoxazole in the given sample.
- 4) Preparation of phenyl azo- $\beta$  Naphthol from Aniline.
- 5) Preparation of Nitrobenzene from Benzene.
- 6) To prepare mordant Yellow dye.
- 7) Preparation of Fast green o dye.
- 8) Preparation of Disperse Dye.
- 9) Fermentative production of citric acid using fungi *Aspergillus niger*.
- 10) To estimate the amount of diazepam in the given solution by non-aqueous titration method.



**Instructional Method:**

- a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

**Online Web Resources:**

1. <http://nptel.ac.in/courses/103103029/>
2. <http://www.unitoperation.com/>