GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : V

CHEMICAL TECHNOLOGY

Subject Name: Technology of Intermediates & Colorants
Subject Code: 153604

Teaching Scheme				Evaluation Scheme			
Theory	**Tutorial**	**Practical**	**Total**	**University Exam(E)**	**University Exam(P)**	**Mid Sem Exam(Theory) (M)**	**Practical (Internal)**
3	0	2	5	70	0	30	50

Sr. No.	Course contents
01.	Unit operations in dyestuff industry, Heating & cooling media, Materials of construction, pressure reactors. Pressure reactions – engineering aspects. Pressure vessels, their design & material of construction.
02.	Technology involving unit processes like nitration, sulphonation, reduction, halogenations. Hydrogenation reaction, ammonolysis, aminolysis, hydroxylation, Friedel Craft's reactions & other commonly used processes
03.	Acidity functions. Safer methods of nitration's, sulphonation, chlorosulphonations, Friedel Craft's reactions. Some aspects of unit operations like evaporation, distillation, filtration, drying & transportation of materials in dyestuff industry. Agitation systems & particle size reduction
04.	Manufacturing of raw materials such as phenol, aniline, 2-naphthol, anthraquinone & its derivative, BON acid, phthalic anhydride, naphthol sulphonic acids, naphtylamine sulphonic acids, aminonaphthol sulphonic acids. Manufacturing of some important solvents used in dyestuffs & pigments industry
05.	Technology involved in the production of azo acid, direct, reactive, mental – complex dyes, azoic components, basic dyes, typical fluorescent whiteners
06.	Principles in isomer separations. Continuous versus batch & semi-batch operations with examples. Solvents used in typical reactions with emphasis on selection criteria. Ionic liquids as solvents. Solid-solid reaction. Statistical quality control techniques. Specifications of raw materials, process parameters, other quality parameters & their statistical treatment. Methods of dyeing.

Reference Books:

1. Unit Processes in Organic Synthesis,. Groggins P.H,Mc Graw Hill, 2001
2. Chemical Process Industry, Joseph A Brink & R N Shrieves, Mc Graw Hill, 1984
3. Fundamental Processes of Dye Chemistry ,Fierz, David, Blangey,Interscience Publishers, 1955
4. Industrial Organic Chemistry, Weissermal K, and Arpe H.J., John Wiley, 1997
5. Organic Synthesis, Smith M.B., Tata McGraw Hill, New York, 2nd Ed., 2004

6. Chemistry of Synthetic Dyes, Lubs H.A.,Robert E Krieger Publishing Company New York, 1995
7. Organic Chemistry, Clayden, Greeves, Warren, Oxford Univ. Press, 2001
8. Chemistry of Synthetic Dyes, Lubs H.A., Robert E Krieger Publishing Company New York, 1st Ed.,1995
9. Chemistry of Synthetic Dyes – Vol I, Venkatraman K., Academic Press, New York, 2009
10. Chemistry of Synthetic Dyes – Vol II, Venkatraman K., Academic Press, New York, 2009
11. Chemistry of Synthetic Dyes – Vol III, Venkatraman K., Academic Press, New York, 2009
12. Chemistry of Synthetic Dyes – Vol IV, Venkatraman K., Academic Press, New York, 2009
13. Chemistry of Synthetic Dyes – Vol V, Venkatraman K., Academic Press, New York, 2009
14. Chemistry of Synthetic Dyes – Vol VI, Venkatraman K., Academic Press, New York, 2009
15. Color Chemistry: Syntheses, Properties and Applications of Organic Dyes and Pigments ,Heinrich Zollinger, Wiley-VCH,2nd Ed, 1991