

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN TEXTILE PROCESSING TECHNOLOGY

SEMESTER: V

Subject Name: **Chemistry of Intermediates and Dyestuffs**

Sr. No.	Course content
1.	Introduction and Development of Dyes: 1.1 Dyes, White dyes and Pigments. Historical development of synthetic dyes. Discovery of Mauveine and Alizarin. 1.2 Requisites of a True dye. 1.3 Brief history of Indian dyestuff Industry.
2.	Colour and Chemical Constitution: 2.1 Basic terms of colour chemistry. 2.2 Relation between colour and chemical constitution. 2.3 Different theories to explain relation between colour and chemical constitution - Witt's theory, Armstrong's theory, Baeyer's theory, Nietzki's theory, Watson's theory, Modern theories – Valence bond theory (resonance theory) and Molecular orbital theory
3.	Chemistry of Dyestuff Intermediates: 3.1 Raw material for basic chemicals (Primaries). 3.2 Sources of basic chemicals – coaltar, petroleum and natural gas. 3.3 Distillation of coaltar and petroleum. 3.4 Unit processes used in the dyestuff production. –Nitration, Sulphonation. Amination by reduction, Ammonolysis, Oxidation, Halogenation, Hydrolysis, Dehydration, Reduction, Alkylation, Alkali Fusion, Diazotisation etc. 3.5 Manufacture of aliphatic compounds and aromatic compounds as dyestuff Intermediates.
4.	Classification of Dyes: 4.1 Classification based on method of application . 4.2 Classification based on chemical constitution (Structure).
5.	Synthesis of Various Dyes of Different Class of Dyes: 5.1 Nitro and nitroso dyes. 5.2 Azo dyes – Direct, Acid, Basic, Mordant, Disperse azo dyes. 5.3 Azoic dyes – Naphthols and fast bases. 5.4 Diphenylmethane dyes (DPM). 5.5 Triphenylmethane dyes (TPM). 5.6 Phthalocyanine. 5.7 Xanthene dyes.

	5.8 Heterocyclic dyes – Acridine dyes, Quinoline dyes, Cyanine dyes. 5.9 Indigos and Thioindigos. 5.10 Solubilised vat dyes. 5.11 Anthraquinonoid dyes – Mordant, Vat, Disperse and Acid dyes. 5.12 Reactive dyes – Procion dyes and Vinyl sulphone dyes.
6.	Synthetic Organic Pigments: 6.1 Toner pigment and lakes. 6.2 Types of pigments. 6.3 Requirement of organic pigment. 6.4 Uses of Synthetic Organic pigment in textile dyeing and printing.
7.	Non-Textile Uses of Dyes: 7.1 Dyes for food and drugs. 7.2 Dyes for leather, wood and paper. 7.3 Dyes for cosmetic and photography. 7.4 Dyes for indicator and reagents.
8.	Recent Development: 8.1 Development in eco-friendly dyes to satisfy the eco-parameters. 8.2 Role of dyestuff manufacturing companies to reduce impact on environment. Brief study of toxic intermediates and banned azo dyes.

Reference Books:

Sr. No.	Name of Books	Authors
1.	The chemistry of synthetic dyes (Vol. I to VII)	K. Venkat Raman
2.	Organic Chemistry (Vol. I & II)	I. L. Finar
3.	Synthetic Dyes	M. S. Yadav
4.	Synthetic Organic Chemistry	O. P. Agarwal
5.	Synthetic Dyes	G. R. Chatwal
6.	Handbook of Synthetic dyes and pigments (Vol. I to III)	Dr. K. M. Shah
7.	Chemistry of dyes and principles of dyeing (Vol. II)	Dr. V. A. Shenai