

Course Code	Course Name	Credits
26CH107	TEXTILE CHEMISTRY	04

Course Objectives

- To understand the preparation, dyeing, printing, and finishing processes of textile materials.
- To explain the principles of different dyes, dyeing techniques, and textile processing methods.
- To develop knowledge of quality control and environmental aspects in textile processing.

Learning Outcomes

Upon successful completion of this course it is intended that a student will be able to:

- Develop an understanding about textile fibres structure, properties, chemical processing and application, to associate theory with skills and competences, provided during laboratory works.
- Interpret the mechanisms of various chemical and mechanical finishes of textile materials.
- Understand latest developments in textile wet processing.

Unit 1 - Preparation and Bleaching (12 Hrs.)

Impurities present in grey cotton and cotton fabrics; objectives and process of singeing; objectives of desizing—acid and enzyme desizing; objectives of scouring—process of caustic scouring using a kier machine; objectives of bleaching—chlorine and peroxide bleaching; concept of full bleaching; use of blueing agents and optical brightening agents; drying on vertical drying range.

Unit 2 – Dyeing Techniques for Natural and Synthetic Fibres (12 Hrs.)

Classification of dyes; dyeing of cotton with reactive, vat, and sulphur dyes—recipes and procedures; dyeing of polyester with disperse dyes—recipes and procedures; dyeing of wool, nylon, and silk with acid and basic dyes; dyeing of acrylic with basic dyes—recipes and procedures.

Unit 3 - Principles and Processes of Textile Printing (12 Hrs.)

Comparison between dyeing and printing; styles and methods of printing; ingredients in printing paste; batik printing on cotton using reactive dyes; screen and rotary screen design preparation; table screen printing; flat-bed screen printing machine; rotary screen printing machine; study of curing machines and steamers.

Unit 4 – Chemical and Mechanical Finishing of Cotton Fabrics (12 Hrs.)

Finishing of cotton fabrics using stiffeners (starch, PVA, polyvinyl acetate) and softeners (anionic, cationic, and non-ionic); anti-crease finishing; sanforizing (pre-shrinking); use of silicones in finishing; mercerization—process using any one type of mercerizing machine; damping and calendaring; finishing using hot-air stenters..

Unit 5 - Quality Control and Environmental Aspects in Textile Processing (12 Hrs.)

Importance and need for quality control; determination of wash fastness (ISO tests 3 and 4); wet and dry rubbing fastness; light fastness; principles, merits, and demerits of colour matching and computer colour matching; importance and need for environmental protection; air, water, and noise pollution in the textile industry; constituents of air, water, and noise pollutants; brief study of effluent treatment with a suitable plant layout (process flow chart only); importance of eco-friendly processing; list of banned dyes and chemicals; eco-labels.

Reference Books:

1. C.W. Pellow, Dyes and Dyeing, Abhishek publication, 2000.
2. Carbman B.P, Fiber to Fabric, International Students Edition, MC Graw Hill Book Co., Singapore, 2000.
3. An Introduction to Textile Printing, Clarke, W, Wood Head Publishing Limited, 2004.
4. J.L.Smith, Textile Processing, Abhisekh Publications, Chandigarh, 2000.
5. Technology of Textile Processing, Shenai. V.A , Sevak Publication, 1987.

Websites and eLearning Sources:

1. <https://archive.nptel.ac.in/content/storage2/courses/116104045/lecture2.pdf>
2. https://onlinecourses.nptel.ac.in/noc22_te11/preview

COs and Bloom's Taxonomy Mapping – 26CH107

Course Outcomes	On completing U.G. program the students will be able to	BTL
CO1	Understand and explain the difference of grey cotton, fabric and their drying range.	K1, K2
CO2	Classify and apply different types of dyes for dyeing various fabrics using appropriate dyeing recipes.	K3
CO3	Differentiate the printing style and method involved and can design the screen and rotary screen printer.	K4
CO4	Analyze the difference of finished product and can able to evaluate the how much percentage of dyeing agent were required for obtaining the finest product.	K5
CO5	Estimation of dye pollution from the finished product and the impact of dying agent toward environment and human health.	K6

BTL K1 and K2 – remembering and understanding, K3- Applying, K4 – Analyse, K5- Evaluate and K6- Create

Relationship Matrix – 26CH107

Course Outcomes	Programme Outcomes (POs)						Programme Specific Outcomes (PSOs)						Mean Score of Cos
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	3	2	2	1	1	1	3	2	2	1	1	1	1.6
CO2	3	2	2	2	2	1	3	2	2	1	1	1	1.8
CO3	3	3	2	2	2	1	3	3	2	2	1	1	2.1
CO4	3	3	3	2	2	1	3	3	2	3	2	1	2.3
CO5	3	3	3	3	2	2	3	3	3	3	2	2	2.6
Total													2.08

Mean Score: 3- High, 2- Medium/Moderate, 1-Low

