

PTX4I104 TEXTILE CHEMICAL PROCESSING –II**Course Objectives**

- To make the students learnt about the process of dyeing of textiles made up synthetic fibres like polyester, nylon, acrylic fibres and their blends with natural and man-made fibres.
- To understand the different machineries used in pretreatment and dyeing process of the textile materials
- To impart knowledge about printing process, methods of printing and machineries used in printing.
- To impart knowledge about the different finishing treatment need to be given to textile materials and methods of application of those finishing treatment.

Course Outcomes

After successful completion of this course, the students should be able to :

- Do dyeing of textiles made up synthetic fibres like polyester, nylon, acrylic fibres and their blends with natural and man-made fibres.
- Choose and control process parameters and use of dyeing machines for dyeing of textile materials .
- Select the dyes and recipe for preparation of printing paste for printing of textile materials.
- Have concept about various finishing treatment process and treat the fabric with different finishing agent.
- Identify the different class of dyes

Module-I (10 Hours)

Dyeing of polyester fabric using disperse dye by HT&HP, Carrier and Thermosol processes; Dyeing of cationic dyeable polyester fabrics; dyeing of P/C and P/W blended fabrics with suitable dyes; Dyeing of Nylon with acid dyes; dyeing of acrylic with cationic dyes.

Identification of dyes: Identification of dye on dyed natural and man made textiles

Module-II (10 Hours)

Dyeing of blends: Classification of blends, shades and methods for dyeing of blends. Suitability of each method for dyeing of specific blend like P/C, P/V, P/W. W/A.

Pretreatment and dyeing machineries: Singeing m/c, J-box, kier, mercerizing machine, loose fibre, yarn and package dyeing machines. Jigger, winch, jet and HTHP beam dyeing m/cs. Padding mangles. Continuous bleaching range CDR

Module-III (10 Hours)

Printing: Object of Printing, Difference between dyeing and printing, **Print Paste:** Constituent and characteristics of print paste, classification and mechanism of working of thickeners.

Printing methods: Hand block, roller and screen printing processes. Working of roller printing machine, photoelectric method of screen preparation. Drawback and advantage of each method.

Study of different styles of printing: Direct, Discharge and Resist.

Printing of cotton (with reactive, vat and azoic dyes and pigment), Silk (with acid dyes), Polyester (with disperse dye) and Acrylic (with basic dyes).

Printing after treatments: Importance of steaming, curing, ageing of prints. Mechanism of each process

Transfer Printing: Types, mechanism of transfer in each type and machineries. Transfer printing of natural, man made and blended textiles.

Module-IV (10 Hours)

Finishing: Classification and importance of finishing.

Mechanical finish: Calendaring and working of different calendaring machines; Sanforizing.

Chemical finish: Anti crease finish , water proof and water repellent finish; flame retardant and fire proof finish; Moth proof finish; Soil release finish; Organdi finish; Bio-polishing, Stonewashing of denim , Anti-bacterial finish, UV finish.

Waste minimization : Need for waste minimization – Brief idea about chemical and auxiliary's conservation, water conservation, energy conservation. Textile effluent - techniques of effluent treatments – Flow chart of primary, secondary and tertiary treatment.

Books Recommended:

1. Miles L W C, "Textile Printing", Dyers Company Publication Trust, Bradford, England, 1981.
2. Shenai V A, "Technology of Printing", Sevak Publications, Mumbai, 1990.
3. Hall A J, "Textile Finishing", Haywood Books, London, 1996.
4. Shenai V A and Saraf, N M, "Technology of Textile Finishing", Sevak Publications, Mumbai, 1990.
5. Gulrajani M. L. (ed), "Advances in the dyeing and finishing of technical textiles", Woodhead Publishing Ltd., 2013.
6. Shenai V. A., "Technology of Textile Finishing", B.I. Publication, Mumbai, 1989.
7. Menachem Lewin and Stephen B. Sello., "Handbook of Fibre Science and Technology:
Volume I:Chemical Processing of Fibres and Fabrics-Fundamentals and Preparation" and
Volume II: Functional finishes, Marcel Dekker, Inc., 1983
8. Karmakar S. R., "Chemical Technology in the Pre-treatment Process of Textiles", Elsevier sciences B.V.,1999
9. Bhagwat R. S., "Handbook of Textile Processing", Colour Publication, Mumbai,1999
10. Cavaco-Paulo A. and Gubitz G. M., "Textile Processing with enzymes", Woodhead Publication Ltd., 2003
11. Heywood D., "Textile Finishing", Wood head Publishing Ltd., 2003.
12. Schindler W. D. and Hauser P. J., "Chemical finishing of textiles", Woodhead Publishing Ltd., 2004