



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Diploma Engineering

Level: Diploma

Branch: Textile Processing Technology

Subject Code : DI04029041

Subject Name : Elements of Textile Processing

w. e. f. Academic Year:	2025 – 26
Semester:	4 th
Category of the Course:	PCC

Prerequisite:	To study this subject, students should have a basic understanding of textile fibers, their classification, and fundamental properties. A prior knowledge of yarn and fabric formation processes such as spinning and weaving will help in understanding the effects of wet processing treatments. Familiarity with basic chemistry concepts is also essential to comprehend the chemical reactions and behaviour of different textile materials during processing.
Rationale:	Wet processing of textiles has specific aspects because it increases aesthetic as well as wearable value of different textiles as per requirements. The processing of textiles is a vast complex area in itself and hence there is a separate branch of engineering known as textile processing technology. This course provides only basic and brief knowledge about textile wet processing of various types of textiles. This course also provides the clear concept about the physical & chemical behaviour of various textiles.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Apply fundamental & mathematical aspects of textile processing.	R +U + A
02	Understand appropriate pretreatments of various textiles.	R + U + A
03	Understand appropriate dyeing of various textiles.	R + U + A
04	Understand appropriate printing of various textiles.	R + U + A
05	Understand appropriate finishing of various textiles.	R + U + A

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial / Practical		
				ESE(E)	PA(M)	PA(I)	ESE(V)	
2	0	2	3	70	30	20	30	150



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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Fundamentals of Textile Processing 1.1 Importance of textile wet processing. 1.2 Mathematical aspects of textile wet processing. 1.3 Processing sequences for cotton, viscose rayon, polyester and nylon textiles. Difference between textile manufacturing and textile wet processing.	04	15
2.	Pretreatment Technology 2.1 Importance of pretreatment of textiles. 2.2 Objectives of shearing & cropping, singeing, desizing, scouring and bleaching process. 2.3 Grey inspection 2.4 Shearing & cropping 2.5 Gas singeing 2.6 Enzymatic Desizing of cotton 2.7 Scouring of cotton, viscose rayon, polyester & nylon textiles. 2.8 Classification of bleaching agents 2.9 Bleaching of cotton with hypochlorite & H ₂ O ₂ . 2.10 Bleaching of polyester with sodium chlorite. Pretreatment machineries such as close kier machine, Cold-Pad batch machine and J-box.	8	25
3.	Dyeing Technology 3.1 Requirements of dyeing of textiles. 3.2 Classification of textile dyes 3.3 Dyeing of cotton & viscose rayon fabric with direct dyes 3.4 Dyeing of polyester with disperse dyes 3.5 Dyeing of nylon with acid dyes 3.6 Dyeing machineries such as Jigger dyeing machine, Jet dyeing machine, 2 & 3 bowl padding mangle.	8	25
4.	Printing Technology 4.1 Requirements of printing of textiles. 4.2 Methods of textile printing. 4.3 Styles of textile printing. 4.4 Printing of cotton & viscose rayon fabric with direct dyes 4.5 Printing of polyester with disperse dyes 4.6 Printing of nylon with acid dyes 4.7 Printing machineries such as Flat bed screen printing machine and Rotary screen printing machine.	6	20



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5.	Finishing Technology	4	15
	4.1 Requirements of textile finishing		
	4.2 Objectives of textile finishing		
	4.3 Classification of textile finishes		
	4.4 Cylinder drying		
	4.5 Stiffening		
	4.6 Delustring		
	4.7 Heat setting		
	4.8 Softening		
Total		30	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
20	40	40	0	0	0

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

Sr. No.	Title of Book	Author	Publication with place, year and ISBN
1	Bleaching, Mercerizing & Dyeing of cotton materials	R. S. Prayag	Shree J. Printers, Pune
2	Dyeing of wool, silk & manmade fibres	R. S. Prayag	Shree J. Printers, Pune
3	Technology of printing	R. S. Prayag	Shree J. Printers, Pune
4	Textile Finishing	R. S. Prayag	Shree J. Printers, Pune
5	Handbook of Textile Processing Machinery	R. S. Bhagwat	Colour Publication PVT. LTD., Mumbai

(b) Open source software and website:

- 1 <https://nptel.ac.in>
- 2 www.youtube.com
- 3 www.fibre2fashion.com
- 4 www.textilelearner.net
- 5 www.textiletutorials.com



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6 www.textilefashionstudy.com

Suggested Course Practical List:

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Require
1	Desizing of cotton fabric.	II	02
2	Scouring of cotton/viscose rayon fabric.	II	02
3	Scouring of polyester fabric.	II	02
4	Scouring of nylon fabric.	II	02
5	Bleaching of cotton fabric using hydrogen peroxide.	II	02
6	Bleaching of polyester using sodium chlorite.	II	02
7	Dyeing of cotton fabric with direct dyes.	III	02
8	Dyeing of polyester fabric with disperse dyes.	III	02
9	Dyeing of nylon fabric with acid dyes.	III	02
10	Printing of cotton fabric with direct dyes.	III	02
11	Printing of polyester fabric with disperse dyes.	III	02
12	Printing of nylon fabric with acid dyes.	III	02
13	Stiffening of cotton fabric.	IV	02
14	Delustering of viscose rayon.	IV	02
15	Heat setting of polyester fabric.	IV	02
16	Softening of cotton fabric.	IV	02
	Total Hours		32

List of Laboratory/Learning Resources Required:

Sr. No.	Equipment Name with Broad Specifications	PrO. No.
1	Dye Pots: 250 ml, 500 ml	All
2	Glass rod	All
3	Beaker: 100 ml, 250 ml, 500 ml	All
4	Measuring Cylinder of capacity 10 ml, 25 ml, 100 ml	All
5	Water Heating Bath	All
9	Laboratory Stirrer: 300 to 500 rpm	All



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10	Laboratory Oven: 150°C	7-8
12	Laboratory Padding Mangle: Horizontal	All
13	Digital weighing balance: 0.02 gm accuracy (100 gm)	All

Suggested Project List:

- 1 **Data sheet:** Prepare a data sheet for chemicals used for textile processing.
- 2 **Need of Pretreatment:** Collect the data for various pretreatment processes through industrial survey and internet search.
- 3 **Sample collection:** Visit Textile Industries / Market shops and collected dyed samples.
- 4 **Textile machines:** Prepare a short video of different textile machines by visiting industries and arrange as per process.
- 5 **Finishing:** Prepare a report on finishing of textiles and collect samples from industries.
- 6 **Printing:** Collected printed textile samples from industries and compile them.

Suggested Activities for Students:

- 1 Literature survey of preparatory processes used for Various Textile Fabrics.
- 2 Collection and Study of various grey textiles samples from different industries.
- 3 Visit textile industries and prepare process sequences for various textiles.
- 4 Poster presentation on textile processing machineries.
- 5 Collection of pictures related to textile processing & makes Power point Presentation.
- 6 Seminar/Quiz/Presentation on natural and synthetic textile processing.

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