



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Textile Engineering

Subject Code : ME02025071

Subject Name : Advances in Finishing of Textiles

w. e. f. Academic Year:	2024-25
Semester:	2
Category of the Course:	Professional Elective Course

Prerequisite:	Basics of textile finishes of undergraduate.
Rationale:	Subject will cover various advanced techniques used in the field of textile finishes processing.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Understand the principles and objectives of various textile finishing techniques.	R,U
02	Analyze the impact of mechanical and chemical finishing processes on textile properties.	U,A,E
03	Evaluate advanced finishing techniques and their applications in the textile industry.	U,A,E,C
04	Apply sustainable and eco-friendly finishing methods.	U,A,E,C
05	Characterize and test finished textiles using modern analytical techniques.	U,A,E

*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 / CA (M)	PA/CA (I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Introduction and overview of Textile Finishing, Definition and history, Key processes and techniques, Importance and Objectives of Finishing, Enhancing fabric properties, Improving aesthetic appeal, Functional benefits, Classification of Finishes, Temporary, semi-	5	12



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	durable, and durable finishes, Mechanical vs. chemical finishes		
2.	Calendering, Types of calendering (simple, friction, embossing), Applications and effects on fabric, Sanforization, Process and machinery, Benefits for fabric stability, Emerizing/Sueding, Techniques and equipment, Surface texture modifications, Heat Setting, Methods and materials, Impact on fabric properties	9	21
3.	Softening and Stiffening, Types of softeners and stiffeners, Application methods, Wrinkle-Resistant Finishing, Chemical agents used, Process and durability, Waterproofing and Water Repellency, Hydrophobic treatments, Flame Retardant Finishing, Chemicals and application techniques, Antimicrobial Finishing, Agents and methods, Efficacy and safety	8	19
4.	Nanotechnology in Textile Finishing, Nanoparticles and their applications, Benefits and challenges, Plasma Treatment, Types of plasma and effects on textiles, Environmental impact, Enzyme Finishing, Types of enzymes used, Applications and benefits, Microencapsulation, Techniques and materials, Functional applications	10	24
5.	UV Protection, UV-absorbing agents, Anti-Static Finishes, its Mechanisms and materials, Applications in different textiles. Soil Release Finishes, Chemicals and application methods. Thermochromic and Photochromic Finishes, Mechanisms and materials, Applications and testing.	7	14
6	Physical Testing, Tensile strength, Abrasion resistance, Chemical Testing, pH levels, Functional Testing, Water repellency, Flame resistance.	6	10
	Total	42	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	25	25	15	10	5

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:



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1. Textile Finishing by Derek Heywood
2. Chemical Finishing of Textiles, edited by W.D. Schindler and P.J. Hauser
3. Handbook of Technical Textiles, edited by A.R. Horrocks and S.C. Anand
4. Functional Finishes for Textiles, edited by Roshan Paul
5. Sustainable Practices in the Textile Industry, edited by Subramanian Senthilkannan Muthu

(b) Open source software and website:

1. <http://nptel.ac.in>
2. World Wide Web, Google Search Engine etc.

List of Practicals:

1. Calendering and its Effects on Fabric Properties
2. Application of Softening Agents and Evaluation of Hand Feel
3. Wrinkle-Resistant Finishing and Crease Recovery Testing
4. Waterproofing Finishes and Water Repellency Testing
5. Antimicrobial Finishing and Assessment of Antibacterial Activity
6. Nanotechnology-Based Finishing and Characterization Using SEM
7. Plasma Treatment of Textiles and Surface Energy Measurement
8. Bio-Polishing of Cotton Fabrics and Evaluation of Surface Smoothness
9. Application of UV Protective Finishes and Testing for UV Protection Factor (UPF)
10. Evaluation of Soil Release Finishes Using Stain Removal Tests

List of Laboratory/Learning Resources Required:

Multi roll Calendar machine, Padding mangle, Sanforiser, HTHP Kier boiler, Color matching cabinet, Stenter dryer, Color Fastness Tester, Washing Fastness Tester, Grey scale for washing and rubbing fastness etc.

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