ANNA UNIVERSITY, CHENNAI

NON- AUTONOMOUS COLLEGES

AFFILIATED TO ANNA UNIVERSITY

M. TECH. TEXTILE TECHNOLOGY (with Specialization in TEXTILE CHEMISTRY)

REGULATIONS 2025

PROGRAMME OUTCOMES (POs):

PO	Programme Outcomes
PO1	An ability to independently carry out research /investigation and development work to solve practical problems
PO2	An ability to write and present a substantial technical report/document.
PO3	Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program

PROGRAMME SPECIFIC OUTCOMES(PSOs):

PSO	Programme Specific Outcomes
PSO1	Apply knowledge of textile chemistry and technology to improve wet processing operations and product quality.
PSO2	Demonstrate proficiency in using modern analytical and processing tools for sustainable textile wet processing.

ANNA UNIVERSITY, CHENNAI

POSTGRADUATE CURRICULUM (NON-AUTONOMOUS AFFILIATED INSTITUTIONS)

Programme: M. Tech., Textile Technology
(with Specialization in Textile Chemistry) **Regulations:** 2025

Abbreviations:

BS – Basic Science (Mathematics)
ES – Engineering Science (General (**G**), Programme Core (**PC**), Programme Elective (**PE**))
SD – Skill Development
SL – Self Learning
OE – Open Elective

L – Laboratory Course
T – Theory

LIT – Laboratory Integrated Theory

PW – Project Work

TCP – Total Contact Period(s)

Semester I

S. No.	Course Code	Course Title	Type	Periods per week			TCP	Credits	Category
				L	T	P			
1.	MA25C08	Statistics for Technologists	T	3	1	0	3	4	ES (PC)
2.	TY25101	Advanced Textile Chemistry (Fibres, Dyes and Auxiliaries)	T	3	0	0	3	3	ES (PC)
3.	TY25102	Green Chemistry and Sustainable Processing	T	3	0	0	3	3	ES (PC)
4.	TY25103	Costing and Process House Management	T	3	0	0	3	3	ES (PC)
5.	TY25104	Environmental Social Governance	T	3	0	0	3	3	ES (PC)
6.	TY25105	Coloration and Finishing Laboratory	L	0	0	4	4	2	SD
7.	TY25106	Product Design and Characterisation of Technical Textiles - I	L	0	0	4	4	2	ES (PC)
8.	TY25107	Technical Seminar	-	0	0	2	2	1	SD
Total Credits							**25**	**21**	

Semester II

S. No.	Course Code	Course Title	Type	Periods per week			TCP	Credits	Category
				L	T	P			
1.		Environmental Audit in Textile Processing Industry	T	3	0	0	3	3	ES (PC)
2.		Circular Economy and Ecolabelling	T	3	0	0	3	3	ES (PC)
3.		Programme Elective - I	T	3	0	0	3	3	ES (PE)
4.		Programme Elective - II	T	3	0	0	3	3	ES (PE)
5.		Programme Elective - III	T	3	0	0	3	3	ES (PE)
6.		Product Design and Characterisation of Technical Textiles - II	T	0	0	4	4	2	ES (PC)
7.		Industry Oriented Course I	---	1	0	0	1	1	SD
8.		Self Learning Course	--	-	-	-	-	1	-
9.		Industrial Training	---	---	--	---	---	--	SD
Total Credits							**20**	**19**	

Evaluation will be done in third semester for the summer internship.

Semester – III

S. No.	Course Code	Course Title	Type	Periods per week			TCP	Credits	Category
				L	T	P			
THEORY									
1.		Programme Elective - IV	T	3	0	0	3	3	ES (PE)
2.		Programme Elective - V	T	3	0	0	3	3	ES (PE)
3.		Open Elective	T	3	0	0	3	3	ES (OE)
4.		Industrial Training	---	---	--	---	---	2	SD
5.		Industry Oriented Course I	---	1	0	0	1	1	SD
6.		Project Work I	---	0	0	12	12	6	SD
Total Credits							**22**	**18**	

Semester IV

S. No.	Course Code	Course Title	Type	Periods per week			TCP	Credits	Category
				L	T	P			
1.		Project Work II	---	0	0	24	24	12	SD
Total Credits							**24**	**12**	

PROGRAMME ELECTIVE COURSES (PE)

S. No.	Course Code	Course Title	Periods			Total Contact Periods	Credits
			L	T	P		
1		Textile Costing and process Optimization	3	0	0	3	3
2		Functional Dyes	3	0	0	3	3
3		Characterization of Textile Polymers	3	0	0	3	3
4		Chemical Processing of Manmade fibres.	3	0	0	3	3
5		Non- woven and specialty Textiles	3	0	0	3	3
6		Advanced Instruments for Textile Wet Processing.	3	0	0	3	3
7		Coated And Laminated Textiles	3	0	0	3	3
8		Bio processing of Textiles	3	0	0	3	3
9		High Performance Fibres	3	0	0	3	3
10		Eco-Friendly dyes, Chemicals and Processing	3	0	0	3	3
11		Technical Textiles	3	0	0	3	3
12		Textile Reinforced Composites	3	0	0	3	3
13		Advanced Wet Processing Machinery	3	0	0	3	3
14		Design of Textile Experiments	3	0	0	3	3
15		Home Textiles	3	0	0	3	3
16		Total Quality Management	3	0	0	3	3
17		Sustainability in textile industry	3	0	0	3	3
18		Protective Clothing	3	0	0	3	3

Semester I

MA25C08	Statistics for Technologists	L	T	P	C
		3	1	0	4

Course Objective:

To make the students to learn about the

- Probability distributions, sampling and testing of hypothesis.
- Process control using charts and process capability.
- Design of experiments for industry applications and
- Modeling the probabilistic phenomena.

Probability Distribution and Estimations: Applications of Binomial, Poisson, normal, t, exponential, chi-square, F and Weibull distributions in engineering; point estimates and interval estimations of the parameters of the distribution functions.

Activity: Use real or simulated data sets to fit different probability distributions (Binomial, Poisson, Normal, Weibull, etc.) using software or spreadsheets.

Hypothesis Testing: Sampling distribution; significance tests applicable– normal test, t-test, chi-square test and F- test; p-Values; selection of sample size and significance levels with relevance to industry applications; acceptance sampling.

Activity: Perform hypothesis tests (t-test, Chi-square, F-test) and interpret results.

Analysis of Variance and Non-Parametric Tests: Analysis of variance for different models; non-parametric tests – sign test, rank test, concordance test.

Activity: Conduct ANOVA and non-parametric tests on sample data.

Process Control and Capability Analysis: Control charts for variables and attributes – basis, development, interpretation, sensitizing rules, average run length; process capability analysis.

Activity: Create control charts and calculate process capability.

Design and Analysis of Experiments: 2k full-factorial designs; composite designs; robust designs; development of regression models, regression coefficients; adequacy test; process optimizations.

Activity: Demenstration of Design of experiments software tool.

Weightage: Continuous Assessment: 40%, End Semester Examinations: 60%

Assessment Methodology: Quiz (20%), Assignments (30%), Internal Examinations (50%)

References:

1 Chatfield, C. (1983). *Statistics for technology: A course in applied statistics*. Routledge. https://doi.org/10.1201/9780203738467

2 Leaf, G. A. V. (1984). *Practical statistics for the textile industry* (Parts I & II). The Textile Institute.

3 Moen, R. D., Nolan, T. W., & Provost, L. P. (1998). *Quality improvement through planned experimentation*. McGraw-Hill.

4 Montgomery, D. C. (2000). *Design and analysis of experiments*. John Wiley & Sons.

5 Montgomery, D. C. (2002). *Introduction to statistical quality control*. John Wiley & Sons

	Description of CO	PO	PSO1	PSO2
CO1	Apply probability distributions to analyze and interpret engineering data.	PO1 (3), PO2(2),	2	1
CO2	Perform hypothesis testing, ANOVA, and non-parametric tests for decision-making.	PO1 (3), PO2(2), PO4(2)	3	2
CO3	Construct control charts and assess process capability in quality control.	PO1 (3), PO2(2), PO4(2)	1	2
CO4	Design and analyze experiments for process optimization.	PO1 (3), PO2(2), PO4(2)	1	3

TY25101	Advanced Textile Chemistry (Fibres, Dyes and Auxiliaries)	L	T	P	C
		3	0	0	3

Course Objective:

- To acquire a detailed knowledge about pre-treatment.
- To acquire knowledge chemistry of dyeing
- To educate technically the various methods and process of dyeing, printing and finishing and auxiliaries.

Grey Preparation: Single stage grey preparation. Degradation of fibres associated with chemical pre-treatment process –degradation of cotton during desizing, scouring, bleaching. Damage of wool, silk, polyester during pre-treatment process. Recent developments in pre-treatments. Auxiliaries associated with De-sizing, scouring, Bleaching of cellulosic fibres, Protein fibres and synthetic fibres.

Activity: Investigate the effects of chemical pre-treatment on cotton fiber strength by comparing tensile strength before and after desizing, scouring, and bleaching.

Physical Chemistry of Dyeing: Kinetic and Equilibrium of dyeing. Adsorption isotherms- Langmuir, Freundlich and" C" isotherms. Determination of dye affinity. State of dye in solutions. Aggregation number-its determination and effect on dyeing. Use of solubility parameter concept in dyeing.

Activity: Plot adsorption isotherms (Langmuir and Freundlich) using dye uptake data to analyze dye affinity on a given fabric sample.

Dyeing: Natural dyes & their dyeing. Antimicrobial dyes, Water repellent dyes and other fluorine containing functional dyes. Biodegradable dyes. Florescent dyes and phosphorescent colorants. Super critical fluid and CO2 dyeing, IR dyes, Ultrasonic, magnetic dyeing. Redox and low temperature processes. Microencapsulation technology in dyeing. Auxiliaries associated with Dyeing with Direct Dyes, Reactive, Vat, Sulphur dyes, Acid dyes, Disperse dyes and natural Dyes.

Activity: Perform a small-scale dyeing experiment using a natural dye and analyze the color fastness and antimicrobial properties of the dyed fabric.

Printing: Pigment printing-optical effect pigment, substrate-based effect. Digital carpet printing. Sublimation. Thermal inkjet printing- Ink systems, Fabric pre-treatments and post treatment, Jet printing machines, Limitations. Transfer printing, Garment printing-chest printing. Evolution of textile printing workflow, new design styles. Steamer. Auxiliaries associated with printing: Direct Style of Printing, Discharge style of Printing, Resist style of printing.

Activity: Design a simple pattern and simulate digital pigment printing using software or sketching; explore the effects of different printing auxiliaries on fabric appearance.

Finishing: Use of enzymes in textile finishing - Enzymatic processing of natural fibres - Surface modification and functionalization of synthetic fibres. Comfort and health issues related to functional finishes. Super-hydrophobic nano finishes - Photo catalytic self-cleaning nano finishes - Antimicrobial nano finishes. Coating and Lamination methods. Auxiliaries used in Resin Finishing, Stiff finishing, soft finishing, Water repellent, Water Proof, Flame retardant, Soil release.

Activity: Apply an enzymatic treatment on cotton fabric and assess changes in surface properties like softness and hydrophobicity; compare with untreated fabric.

Weightage: Continuous Assessment: 40%, End Semester Examinations: 60%

Assessment Methodology: Quiz (20%), Assignments (30%), Internal Examinations (50%)

Reference(s):

1. M Gulrajani, “Advances in the dyeing and finishing of technical textiles”, The Textile Institute, woodhead publishing, 2013
2. A.A. Vaidya, “Chemical Processing of Man-made Fibres and Blends”, John Wiley and Sons, New York,2004
3. Johnson, A. (n.d.). The theory of colouration of textiles. SDC. ISBN: 0901956481
4. Chakraborty, J. N. (2009). Fundamentals and practices in colouration of textiles. Woodhead Publishing/The Textile Institute.
5. Venkataraman. (2000). Chemistry of synthetic dyes. London: Academic Press.
6. Ujiie, H. (2006). Digital printing of textiles. Woodhead Publishing/The Textile Institute.
7. Shore, J. (1999). Colourants & auxiliaries (Vols. I & II). New York: Wiley and Sons Ltd.

	Description of CO	PO	PSO1	PSO2
CO1	Analyze the impact of pre-treatment methods on fiber properties and fabric quality.	PO1(3), PO2(2)	3	2
CO2	Apply dyeing principles and evaluate the performance of various dye classes.	PO1 (3), PO2(2), PO4(2)	2	2
CO3	Explain and implement different textile printing techniques and their auxiliaries.	PO1 (3), PO2(2), PO4(2)	2	3
CO4	Utilize advanced finishing technologies to improve textile performance and sustainability.	PO1 (3), PO2(2), PO4(2)	2	1

TY25102	Green Chemistry and Sustainable Processing	L	T	P	C
		3	0	0	3

Course Objective:

To make the students aware of principles of green chemistry, Engineering and sustainability.

- To impart knowledge on global environmental issues, need of risk assessment.
- To provide knowledge on pollution prevention and property estimation.
- To learn about evaluation exposure and green chemical synthesis pathways.
- To make the students understand about the methods available for flow sheet analysis and life cycle assessments

Introduction to Green Chemistry: Understanding the issues; Green Chemistry, Definition, Principles of Green Chemistry and Examples; Green Chemistry Methodologies; Green Engineering, Definition, Principles of Green Engineering; Initiatives Taken Up by Countries Around the World; The Green Chemistry Expert System case studies; Principles of Sustainability; The Sustainable Process.

Activity: Identify and discuss real-life examples of green chemistry principles applied in industry. Create a poster or presentation summarizing key green chemistry practices.

Environmental Issues and Risk Assessment: Role of chemical processes and chemical products; An overview of Major Environmental Issues; Global Environmental Issues; Air Quality Issues; Water Quality Issues; Ecology, Natural Resources, Description of Risk; Value of Risk Assessment in the Engineering Profession; Risk-Based Environmental Law; Risk Assessment Concepts; Hazard Assessment, Dose Response, Exposure Assessment, Risk Characterization.

Activity: Analyze a case study on air or water pollution. Perform a basic risk assessment outlining hazards, exposure, and risk characterization.

Pollution Prevention and Property Estimation: Pollution Prevention Concepts and Terminology; Responsibilities for chemical process safety; Responsibilities for environmental protection, Chemical and Physical Property Estimation; Estimating Environmental Persistence; Estimating Ecosystem Risks; Using Property Estimates to Estimate Environmental Fate and Exposure; Classifying Environmental Risks Based on Chemical Structure.

Activity: Estimate environmental persistence and potential risks of a selected chemical using online tools or databases. Suggest greener alternatives.

Evaluating Exposures: Occupational Exposures, Recognition, Evaluation and Control; Exposure Assessment for Chemicals in the Ambient Environment; Designing Safer Chemicals; Quantitative / Optimization, Based Frameworks for the Design of Green Chemical Synthesis Pathways; Green Chemistry Pollution Prevention in Material Selection for Unit Operations; Reactors, Separation Devices, Storage Tanks and Fugitive Sources.

Activity: Conduct a mock workplace exposure assessment for a chemical used in a lab or industry. Propose control measures based on findings.

Flow Sheet Analysis and Life Cycle Assessment: Process Energy Integration; Process Mass Integration; Case Study of a Process Flow sheet; Estimation of Environmental Fates of Emissions and Wastes; Introduction to Product Life Cycle Concepts, Life-Cycle Assessment, Life-Cycle Impact Assessments, Streamlined Life-Cycle Assessments, Uses of Life-Cycle Studies; A Framework for Evaluating Environmental Costs.

Activity: Perform a simplified life cycle assessment (LCA) for a common product (e.g., plastic bottle) and discuss environmental impacts at each stage.

Weightage: Continuous Assessment: 40%, End Semester Examinations: 60%

Assessment Methodology: Quiz (20%), Assignments (30%), Internal Examinations (50%)

References:

1. Allen, D. T., & Shonnard, D. R. (2002). Green engineering: Environmentally conscious design of chemical processes. Prentice Hall PTR.
2. Marteel-Parrish, A. E., & Abraham, M. A. (2014). Green chemistry and engineering: A pathway to sustainability. John Wiley & Sons, Inc.
3. Doble, M., & Kruthiventi, A. K. (2007). Green chemistry and engineering. Elsevier.
4. Clarke, J., & Macquarrie, D. (Eds.). (n.d.). Handbook of green chemistry and technology. Blackwell Publishing.
5. Anastas, P. T., & Warner, J. C. (1998). Green chemistry: Theory and practice. Oxford University Press.
6. Matlack, A. S. (2001). Introduction to green chemistry. Marcel Dekker.
7. Bishop, P. L. (2000). Pollution prevention: *Fundamentals and practice*. McGraw-Hill.

	Description of CO	PO	PSO1	PSO2
CO1	Explain key concepts and global initiatives in green chemistry and sustainability.	PO1(3), PO2(2)	2	3
CO2	Analyze environmental issues and perform risk assessments related to chemical processes.	PO1 (3), PO2(2), PO4(2)	3	2
CO3	Apply pollution prevention techniques and estimate environmental fate of chemicals.	PO1 (3), PO2(2), PO4(2)	2	1
CO4	Utilize life cycle assessment and process integration methods to minimize environmental impact.	PO1 (3), PO2(2), PO4(2)	2	2

TY25103	Costing and Process House Management	L	T	P	C
		3	0	0	3

Course Objective:

- To practice the fundamental concepts of costing and costing systems followed in textile industry.
- To know about the costing of textile products
- To understand the costing fundamentals and its different methods

Fundamentals of Costing: Cost concept; Classification of cost, elements of cost.; Methods of costing; Unit and operating costing, preparation of cost sheet; Estimation of cost of production and component of total cost. Profit planning, job order, batch process, conversion cost. Inventory costing

Activity: Calculate the break-even point for a textile product using given fixed and variable costs.

Cost Accounting: Cost accounting, compare cost accounting and financial accounting, elements of cost, examples from apparel industry, methods of costing, cost sheet preparation

Activity: Prepare a comparison chart highlighting differences between cost accounting and financial accounting with textile industry examples.

Costing Systems: Job order costing; contract costing; process costing: joint and by product costing in apparel manufacturing.

Activity: Simulate process costing by tracking costs through stages of fabric production and calculating cost per unit.

CMT Cost: Costing of garments; factors that determine the price of garments, material cost, cost of yarn, cost of fabric production, cost of fabric processing and design, lot size, cost of components, cutting cost, making and trim cost.

Activity: Conduct a mock cost analysis for a batch of garments, including material, labor, and overheads, and prepare a quotation.

New concepts in costing: New concepts in costing, Activity based costing, Target costing, Cost restructuring issues and cost reduction measures in the textile industry, Cost audit and control measures in spinning, weaving, processing, knitting, garmenting and made-ups.

Activity: Role-play a cost audit meeting where students propose cost restructuring and reduction strategies for a knitting unit.

Weightage: Continuous Assessment: 40%, End Semester Examinations: 60%

Assessment Methodology: Quiz (20%), Assignments (30%), Internal Examinations (50%)

Reference(s):

1. Bhattacharyya, A. K. (2010). *Principles and practice of cost accounting*. PHI.
2. Iyengar, S. P. (2005). *Cost accounting – Principles and practice*. Sultan Chand & Sons.
3. Shinn, W. E. (1995). *Elements of textile costing*. NCSU School of Textiles.
4. Ratnam, T. V. (1992). *Cost control and costing in spinning mills*. SITRA Publications.
5. Varma, H. K. (1992). *Costing in textile industry*. Prentice Hall.
6. Jain, I. C. (2001). *Cost accounting – An introduction*. Prentice Hall.
7. Khan, M. Y., & Jain, P. K. (2003). *Cost accounting*. Tata McGraw-Hill Publishing Co. Ltd.

	Description of CO	**PO**	**PSO1**	**PSO2**
CO1	Calculate and manage costs associated with textile production processes accurately.	PO1(3), PO2(2)	2	3
CO2	Evaluate costing methods and their applications in different segments of the textile industry.	PO1 (3), PO2(2), PO4(2)	1	2
CO3	Develop cost estimation and pricing strategies for garment manufacturing.	PO1 (3), PO2(2), PO4(2)	2	2
CO4	Implement contemporary costing techniques to improve cost efficiency and auditing in textiles.	PO1 (3), PO2(2), PO4(2)	3	2

TY25104	Environmental Social Governance	L	T	P	C
		3	0	0	3

Course Objective:

- Identify social factors impacting business sustainability.
- Explore ways to enhance stakeholder well-being.

ESG Fundamentals & Global Context: Definition, scope, and evolution of ESG; ESG vs. CSR vs. Sustainability; Global drivers, climate change, social justice, corporate transparency; Stakeholders and their expectations; UN Sustainable Development Goals; Emerging ESG trends; Role of ESG in risk management

Activity: Create an infographic comparing ESG, CSR, and Sustainability, highlighting their evolution and key differences.

Environmental Pillar: Climate change and environmental risks; Carbon footprint measurement and reduction strategies; Energy efficiency and renewable adoption; Water stewardship; Waste management and circular economy; Biodiversity conservation; Environmental performance metrics; Global standards, GHG Protocol, CDP; Case studies in environmental best practices.

Activity: Conduct a case study analysis of a company's water stewardship or waste management program and present findings.

Social Pillar: Labor rights and ethical employment; Diversity, equity, and inclusion (DEI) policies; Community engagement; Occupational health and safety; Human rights in supply chains; Consumer protection and product safety; Social impact measurement tools (SA8000, ISO 26000); Addressing modern slavery

Activity: Role-play a stakeholder meeting addressing workplace diversity and human rights challenges in a supply chain.

Governance & ESG Reporting: Corporate governance principles; Board roles, diversity, and independence; Ethical business conduct; Risk management integration; Transparency and accountability; ESG reporting frameworks (GRI, SASB, TCFD, ISSB); Materiality assessment; ESG KPI selection; Data assurance and verification

Activity: Develop a mock materiality matrix for a company, prioritizing ESG issues based on stakeholder input.

ESG Implementation, Finance & Future Trends: Building an ESG strategy and roadmap; Setting and tracking ESG KPIs; ESG-linked finance, green bonds, sustainability-linked loans; ESG ratings and investor expectations; Regulatory frameworks, EU CSRD, SEBI norms, SEC proposals; Sector-specific ESG applications; Digital tools and AI for ESG management; Future trends, climate tech, blockchain, net-zero transitions

Activity: Simulate an ESG investor pitch, explaining the company's ESG strategy and potential for sustainable financing.

Weightage: Continuous Assessment: 40%, End Semester Examinations: 60%

Assessment Methodology: Quiz (20%), Assignments (30%), Internal Examinations (50%)

References:

1. Krosinsky, C., & Robins, N. (2018). *Sustainable investing: Revolutions in theory and practice*. Routledge.
2. Krosinsky, C. (2022). *Principles for responsible investment: ESG investing*. Routledge.
3. Hill, J. (2020). *Environmental, social, and governance (ESG) investing: A balanced analysis of the theory and practice of a sustainable portfolio*. Academic Press.
4. de Villiers, C., Hsiao, P.-C. K., & Maroun, W. (2020). *Sustainability accounting and integrated reporting*. Routledge.

	Description of CO	**PO**	**PSO1**	**PSO2**
CO1	Define and differentiate ESG, CSR, and sustainability concepts and their relevance to global challenges.	PO1(3), PO2(2)	3	2
CO2	Analyze environmental and social performance indicators and their application in corporate settings.	PO1 (3), PO2(2), PO4(2)	2	2
CO3	Interpret governance structures and frameworks supporting ethical and transparent business conduct.	PO1 (3), PO2(2), PO4(2)	2	1
CO4	Design ESG implementation plans incorporating finance mechanisms and emerging technologies.	PO1 (3), PO2(2), PO4(2)	1	1

TY25105	Coloration and Finishing Laboratory	L	T	P	C
		0	0	4	2

Course Objective:

- To impart practical skills in textile dyeing, printing, and finishing processes.
- To understand the behavior of different textile substrates during coloration and finishing.
- To assess the performance and durability of applied dyes and finishes.
- To ensure students are familiar with industrial practices and eco-friendly methods.
- To practice the students in finishing of textile materials for different requirements and end uses.
- To train the students in pre-treatment, dyeing, printing and testing of textile materials

List of Experiments:

1. Dyeing of Cotton fabric/yarn using Direct dyes
2. Dyeing of Cotton fabric/yarn using reactive dye
3. Dyeing of Cotton fabric/yarn using Vat dye
4. Dyeing of silk fabric/yarn using acid dyes.
5. Printing of Cotton fabric using Pigments by direct style using block/Screen
6. Discharge style of Printing on cotton fabric dyed with reactive dyes.
7. Printing of polyester fabric with disperse dyes using direct style using block/screen
8. Resist style of printing on cotton fabric using block/screen
9. Resin finishing.
10. Weight reduction of polyester.
11. Scroopy finish for silk.
12. Water repellent Finishing.
13. Finishing of fabric using softener
14. Antimicrobial finishing
15. Denim finishing techniques

Weightage: Continuous Assessment: 60%, End Semester Examinations: 40%

Assessment Methodology: Project (30%), Assignment (10%), Practical (30%), Internal Examinations (30%)

	Description of CO	PO	PSO1	PSO2
CO1	Demonstrate dyeing methods for different fibers using various dye classes.	PO1(3), PO2(2)	3	2
CO2	Evaluate fabric printing techniques for cotton, polyester, and silk.	PO1 (3), PO2(2), PO4(2)	2	2
CO3	Analyze fabric finishing processes to improve performance and aesthetics.	PO1 (3), PO2(2),	1	2

TY25106	Product Design and Characterisation of Technical Textiles - I	L	T	P	C
		0	0	4	2

Course Objective:

- To develop hands-on skills in the testing, evaluation, and performance characterisation of selected technical textile products, enabling students to apply standard test methods and interpret results for real-world applications.

List of Experiments:

Geotextiles

1. Determination of tensile strength and elongation of geotextiles (ASTM D4595 / ISO 10319).
2. Measurement of permeability/permittivity of geotextile samples (ASTM D4491).
3. Evaluation of puncture resistance and burst strength (ASTM D6241).

Medical Textiles (Medtech)

4. Assessment of biocompatibility using simulated cytotoxicity tests (ISO 10993 – lab-scale method).
5. Measurement of barrier properties against synthetic blood penetration (ASTM F1670).
6. Determination of antimicrobial activity of medical fabrics (AATCC 100 / ISO 20743).

Protective Clothing (Protech)

7. Measurement of thermal protective performance (TPP test – ASTM F2700).
8. Determination of flame resistance (vertical flammability test – ASTM D6413).
9. Abrasion resistance testing of protective fabrics (Martindale method – ISO 12947).

Sports Textiles (Sportech)

10. Moisture management test for sportswear fabrics (AATCC 195).
11. Determination of air permeability (ASTM D737 / ISO 9237).
12. Stretch and recovery test for compression fabrics (ASTM D2594).

Filtration Textiles

13. Measurement of filtration efficiency for air filter media (ISO 16890 / EN 1822 – lab simulation).
14. Pressure drop measurement in filtration fabrics.
15. Particle retention and dust-holding capacity test for filter fabrics.

Weightage: Continuous Assessment: 60%, End Semester Examinations: 40%

Assessment Methodology: Project (30%), Assignment (10%), Practical (30%), Internal Examinations (30%)

	Description of CO	PO	PSO1	PSO2
CO1	Conduct standardized tests to evaluate mechanical and functional properties of various technical textiles.	PO1(3), PO2(2)	2	3
CO2	Interpret test results to assess textile performance in real-world applications.	PO1 (3), PO2(2), PO4(2)	1	2
CO3	Analyze performance of sports and filtration textiles for moisture management and efficiency.	PO1 (3), PO2(2),	3	2