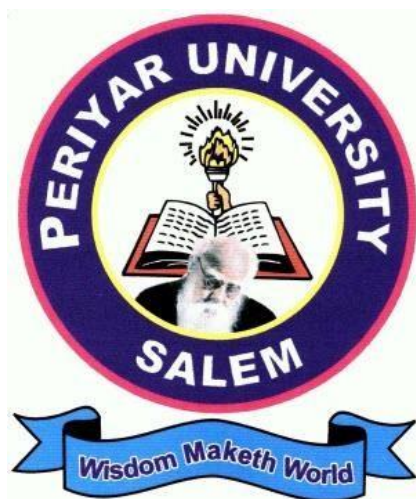


PERIYAR UNIVERSITY

PERIYAR PALKALAINAGAR

SALEM – 636 011



DEGREE OF MASTER OF SCIENCE

CHOICE BASED CREDIT SYSTEM

SYLLABUS FOR

M.Sc. TEXTILES AND FASHION DESIGNING

FOR THE STUDENTS ADMITTED FROM THE ACADEMIC

YEAR 2026-2027 ONWARDS

M.Sc. TEXTILES AND FASHION DESIGNING

CBCS PATTERN & OBE REGULATIONS AND SYLLABUS

PROGRAMME OUTCOMES (POs)

On successful completion of the programme, graduates will be able to:

1. Apply advanced scientific, technical, and managerial knowledge in textiles, apparel, fashion design, and allied industries.
2. Analyze, design, and develop innovative textile materials, garments, and fashion products using creativity, sustainability, and emerging technologies.
3. Conduct independent research, product development, and technology-driven innovation to solve complex problems in the textile and fashion sectors.
4. Utilize modern digital technologies including CAD, Artificial Intelligence (AI), Industry 4.0, digital marketing, data analytics, and smart manufacturing systems.
5. Establish and manage entrepreneurial ventures, consultancy services, fashion brands, research organizations, and technology-based enterprises.
6. Demonstrate leadership, professional ethics, teamwork, communication, and lifelong learning while contributing to the sustainable development of the global textile and fashion industry.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

Upon successful completion of the programme, graduates will be able to:

PSO1. Apply advanced knowledge of textile science, fibre technology, technical textiles, textile processing, and apparel manufacturing for industrial and research applications.

PSO2. Design, develop, and evaluate innovative apparel products using advanced fashion design principles, draping, garment engineering, CAD, and digital fashion technologies.

PSO3. Utilize advanced textile testing, quality evaluation, statistical quality control, and international standards for quality assurance in textile and apparel industries.

PSO4. Conduct independent research, analyze experimental data, develop innovative products, and publish scientific findings using appropriate research methodologies.

PSO5. Apply Artificial Intelligence, Industry 4.0, digital manufacturing, automation, smart textiles, data analytics, and emerging technologies in textile and apparel industries.

PSO6. Implement sustainable manufacturing practices, eco-friendly processing, circular economy concepts, ESG principles, and environmental compliance in textile and fashion businesses.

PSO7. Manage apparel production, merchandising, sourcing, retail operations, supply chain systems, quality management, and export-import activities using modern management techniques.

PSO8. Demonstrate entrepreneurial, leadership, consultancy, project management, and innovation skills to establish successful fashion enterprises and technology-based startups.

PSO9. Communicate effectively through technical writing, presentations, teamwork, professional ethics, and multidisciplinary collaboration in academic, research, and industrial environments.

PSO10. Pursue higher education, doctoral research, professional certifications, consultancy, and lifelong learning while contributing to national and global advancements in textile and fashion technology.

GRADUATE ATTRIBUTES

The programme nurtures graduates who are:

1. Advanced Textile Scientists

Analyze and evaluate textile fibres, yarns, fabrics, functional materials, technical textiles, and sustainable textile processing technologies for diverse industrial applications.

2. Innovative Fashion Designers

Develop creative, functional, and sustainable fashion products by integrating design principles, advanced apparel technologies, digital tools, and emerging fashion trends.

3. Research and Innovation Professionals

Conduct scientific research, product development, experimentation, data analysis, and technology transfer to address challenges in textile and fashion industries.

4. Digital and AI Practitioners

Apply CAD, 3D visualization, Artificial Intelligence, Industry 4.0, automation, digital merchandising, data analytics, and virtual technologies in textile and apparel applications.

5. Sustainable Fashion Leaders

Implement sustainable manufacturing practices, circular economy principles, environmental management systems, ESG practices, and ethical sourcing throughout the textile and apparel value chain.

6. Apparel Manufacturing and Quality Specialists

Plan, monitor, and optimize apparel production, quality assurance, industrial engineering, lean manufacturing, Six Sigma, compliance systems, and supply chain management.

7. Entrepreneurs and Business Leaders

Establish and manage fashion enterprises, consultancy services, startups, export businesses, retail organizations, and innovative textile ventures through strategic leadership and entrepreneurship.

8. Professional Managers and Effective Communicators

Demonstrate leadership, teamwork, communication, project management, negotiation, and decision-making skills in multidisciplinary and multicultural professional environments.

9. Globally Competent Professionals

Adapt to international standards, global trade practices, export-import management, international merchandising, and cross-cultural business environments.

10. Lifelong Learners

Pursue continuous professional development, higher education, doctoral research, certifications, and lifelong learning to remain competitive in rapidly evolving textile and fashion industries.

RULES AND REGULATIONS

I. ELIGIBILITY

A candidate seeking admission to the First Year of the Master of Science (M.Sc.) Degree Programme in Textiles and Fashion Designing shall have passed B.Sc. Costume Design and Fashion, B.Sc. Textile and Fashion Designing, B.Sc. Fashion Technology, B.Voc. Textiles and Apparel Design, or any Bachelor's Degree related to Textiles, Apparel, Costume Design, Fashion Design, or an equivalent qualification recognized by the Syndicate of Periyar University.

II. DURATION

The programme shall extend over a period of two academic years comprising four semesters.

III. ELIGIBILITY FOR THE DEGREE

A candidate shall be eligible for the award of the Degree of Master of Science in Textiles and Fashion Designing if he/she has:

- Undergone the prescribed course of study for a period of not less than four semesters in an institution affiliated to and approved by the University.
- Successfully completed all the prescribed courses, internship, research project, and other programme requirements.
- Passed all the examinations prescribed under these regulations.

IV. SUBJECTS OF STUDY

The subjects of study and the detailed syllabus for the M.Sc. Textiles and Fashion Design programme are given in the Annexure.

V. REQUIREMENTS FOR EXAMINATION

The University shall conduct theory examinations for a duration of three hours for all theory courses prescribed in each semester.

Practical examinations shall be conducted for three or four hours, wherever applicable.

The Research Project and Viva-Voce Examination shall be conducted during the Fourth Semester based on the dissertation submitted by the candidate. The Viva-Voce shall be conducted by one Internal Examiner and one External Examiner appointed by the University.

VI. SCHEME OF EXAMINATION

The Scheme of Examination for the programme is given in the Annexure.

All practical examinations, internships, industrial training, project work, dissertation evaluation, and viva-voce examinations shall be conducted and evaluated by the institution with Internal and External Examiners appointed in accordance with University regulations.

VII. PASSING REQUIREMENTS

Theory Courses

Internal Assessment: 25 Marks;

External Examination: 75 Marks;

Total: 100 Marks

A candidate shall be declared to have passed a theory course if he/she secures:

- A minimum of 12 marks out of 25 in Internal Assessment.
- A minimum of 38 marks out of 75 in the External Examination.
- A minimum of 50 marks out of 100 in aggregate.

Practical Courses

Internal Assessment : 40 Marks

External Examination : 60 Marks

Total : 100 Marks

A candidate shall be declared to have passed a practical course if he/she secures:

- A minimum of 20 marks out of 40 in Internal Assessment.
- A minimum of 30 marks out of 60 in the External Examination.
- A minimum of 50 marks out of 100 in aggregate.

Research Project and Viva-Voce

Internal Assessment : 150 Marks

External Evaluation and Viva-Voce : 50 Marks

Total : 200 Marks

A candidate shall be declared to have passed the Research Project and Viva-Voce if he/she secures:

- A minimum of 75 marks out of 150 in Internal Assessment.
- A minimum of 25 marks out of 50 in External Evaluation and Viva-Voce.
- A minimum of 100 marks out of 200 in aggregate.

Pattern of Question Paper

Time: 03 Hours

Maximum: 75 Marks

Part A – (15 x 1 = 15 Marks)

Answer all questions

(a), (b), (c), (d) Multiple Choice questions

(03 questions from each unit)

Part B – (2 x 5 = 10 Marks)

Answer any TWO questions out of FIVE

(01 question from each unit)

Part C – (5 x 10 = 50 Marks)

Answer all questions

Either (or) Type FIVE questions

(01 question from each unit)

M.Sc. TEXTILES AND FASHION DESIGNING

Course of Study and Scheme of Examination

Sem	Course group	Subject Title	Hours/ week	Exam hours	Int. marks	Ext. marks	Total Mark	Credit	Pg. No
I	Core I	Advanced Textile Science	6	3	25	75	100	5	01
	Core II	Sustainable Development for Textiles	6	3	25	75	100	5	04
	Core III	Fashion Merchandising	6	3	25	75	100	5	07
	Core practical I	Advanced Garment Construction Practical	6	4	40	60	100	4	10
	Elective I (Select any one)	Textiles and Apparel quality evaluation	4	3	25	75	100	3	12
		Design Research							15
	SEC I	Fashion Sketching Practical	2	3	40	60	100	2	17
			30				600	24	

Sem	Course group	Subject Title	Hours/ week	Exam hours	Int. marks	Ext. marks	Total Mark	Credit	Pg. No
II	Core IV	Technical Textiles	6	3	25	75	100	5	19
	Core V	Nanotechnology in Textiles	6	3	25	75	100	5	22
	Core practical II	CAD in Textile Designing Practical	6	3	40	60	100	5	25
	Core practical III	Advanced Draping Techniques Practical	5	3	40	60	100	4	28
	Elective II (Select any one)	Import Export Management and Documentation	4	3	25	75	100	3	30
		Entrepreneurship in Textiles							33
	NMEC I	Hand Embroidery practical	2	3	40	60	100	2	36
	Value Education	Human Rights	1	3	25	75	100	1	--
			30				700	25	

Students should attend internship for 15 days and viva voce will be conducted in III Semester

Sem	Course group	Subject Title	Hours/ week	Exam hours	Int. marks	Ext. marks	Total Mark	Credit	Pg. No
III	Core VI	Research Methodology And Statistics In Textiles	6	3	25	75	100	5	38
	Core VII	Textile Testing	6	3	25	75	100	5	41
	Core Practical IV	Textile Testing Practical	6	3	40	60	100	5	44
	Core Practical V	Fashion Portfolio Practical	6	3	40	60	100	4	46
	Elective III (Select any one)	Digital Marketing /	4	3	25	75	100	3	48
		Visual Merchandising							51
	NMEC II	Self-grooming and Photography Practical	2	-	40	60	100	2	54
		Internship				*C/HC		1	--
			30				600	25	

*C/HC - Commended/Highly commended

Sem	Course group	Subject Title	Hours/ week	Exam hours	Int. marks	Ext. marks	Total Mark	Credit	Pg. No
IV	Core VIII	Advanced Textile Processing	6	3	25	75	100	5	56
	Core IX	AI in Apparel Manufacturing	6	3	25	75	100	5	59
	Core X	Research Project and Viva-Voce	16	-	150	50	200	5	--
	SEC II	Professional Competency Skill- Personality Development	2	3	25	75	100	2	62
		Extension Activity	-	-				1	--
		Total	30	-			500	18	
							2400	92	

Electives: Candidates are eligible to select any one of the two choices in elective courses.

Internship/Industrial Activity: The Students should undergo internship/Industrial Activity at least for a minimum of 15 days after II Semester.

Extension Activity: The Students should be insisted to involve in extension activity and should report the activity to the Department.

SEMESTER – I
CORE I
ADVANCED TEXTILE SCIENCE

COURSE OBJECTIVES

Upon successful completion of this course, students will be able to:

- Understand the classification, properties, applications, and recent advancements in natural, regenerated, synthetic, high-performance, and sustainable textile fibres.
- Analyze the structure, manufacturing processes, properties, and applications of conventional, specialty, and functional yarns used in textile and apparel industries.
- Acquire knowledge of advanced fabric formation technologies, including weaving, knitting, and nonwoven manufacturing techniques.
- Develop an understanding of smart textiles, functional textiles, and innovative textile materials for technical and industrial applications.
- Create awareness of sustainable textile technologies, emerging trends, and future developments in advanced textile science.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Classify textile fibres based on origin, structure, properties, and end-use applications.	K2
CO2	Analyze the characteristics and applications of natural, regenerated, synthetic, sustainable, and high-performance fibres	K4
CO3	Explain yarn formation techniques, texturization, fancy yarns, sewing threads, and recent yarn innovations	K2
CO4	Describe advanced weaving, knitting, and nonwoven fabric manufacturing technologies and their applications	K2
CO5	Apply the concepts of smart, functional, composite, and sustainable textiles in apparel and technical textile products	K3
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

Unit I – Natural Fibers and Sustainable Textiles

Natural fibers - Classification of textile fibers based on origin and morphology. Cotton, wool, silk, flax, and other bast fibers: grading, distinctive properties, and end uses. Emerging sustainable fibers: coffee ground fibers, nettle, lotus, pineapple fibers, banana fibers, and other agro-based fibers. Environmental and sustainability aspects in fiber selection.

Unit II – High Performance and Functional Fibers

Properties, manufacture and applications of high-performance fibres including glass, carbon, ceramic, aramid, UHMWPE and advanced polymeric fibres. Functional fibres such as chitosan, alginate, super-absorbent, optical, melamine, hollow, micro and nano-fibres. Recent developments in smart, conductive, antimicrobial, flame-retardant and moisture-management fibres for technical applications.

Unit III – Yarn Technology

Principles of yarn structure and yarn formation. Texturization: objectives, advantages, and methods such as false-twist, air-jet, stuffer-box, and knit-de-knit techniques. Fancy and specialty yarns including slub, boucle, loop, spiral, chenille, core-spun, covered, and composite yarns. Sewing thread manufacture, classification, properties, and applications. Innovations in high-strength, stretch, recycled, functional, and smart yarns.

Unit IV – Weaving and Fabric Formation

Fundamentals of weaving and fabric construction. Shuttle and shuttleless looms: working principles and applications. Modern looms including air-jet, water-jet, rapier, projectile, multiphase, and circular looms. Fabric parameters such as yarn count, EPI, PPI, cover factor, density, dimensional stability, and quality control.

Unit V – Knitting and Nonwoven Technologies

Knitting technology: weft and warp knitting, machine classification, fabric structures, properties, defects, and applications. Advances in 3D knitting, seamless garments, whole-garment knitting, spacer fabrics, sportswear, medical textiles, and smart knitted structures. Nonwoven fabrics: definition, classification, fiber requirements, web formation methods including dry-laid, wet-laid, air-laid, spunbond, meltblown, and electro-spinning. Bonding techniques and applications in hygiene, medical, filtration, geotextiles, automotive, protective, and sustainable nonwoven products.

REFERENCES

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- Gandhi, K. (Ed.). (2019). Woven textiles: Principles, technologies and applications (2nd ed.). Woodhead Publishing.
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- Shishoo, R. (Ed.). (2020). Market-driven innovations in textile materials, technologies and products. Woodhead Publishing.

SEMESTER – I

CORE II

SUSTAINABLE DEVELOPMENT FOR TEXTILES

COURSE OBJECTIVES

- Analyze the principles of sustainable development, green manufacturing, and waste management practices in the textile and apparel industry.
- Evaluate eco-friendly textile processing technologies, sustainable fibres, natural dyes, enzymes, and environmentally responsible chemical management.
- Examine organic fibre production systems, carbon footprint assessment, and sustainable manufacturing practices in textile and apparel production.
- Assess recycling, upcycling, circular economy principles, and resource-efficient approaches for sustainable textile value chains.
- Critically evaluate ethical manufacturing practices, environmental regulations, and corporate social responsibility in the global textile and fashion industry.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Explain the principles of sustainability, green manufacturing, and waste management in the textile and apparel industry.	K2
CO2	Evaluate eco-friendly textile processing technologies, sustainable fibres, natural dyes, enzymes, and environmentally preferred chemicals.	K4
CO3	Analyze organic fibre production systems, carbon footprint assessment, and sustainable textile manufacturing practices.	K4
CO4	Assess recycling, up-cycling, and circular economy concepts for sustainable textile production and consumption.	K5
CO5	Critically evaluate ethical manufacturing, environmental compliance, sustainability standards, and corporate social responsibility in the textile and apparel industry.	K5
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I: Overview of Sustainable Development

Introduction, definition, and concepts of sustainable development. Principles of Sustainable Development and Sustainable Development Goals (SDGs). Difference between conventional chemical manufacturing and green manufacturing. Sustainable chemical management, rules and recommendations for chemical use, and waste management practices in the textile and apparel industry.

UNIT II: Eco-friendly Processing of Textiles

Modern approaches to eco-friendly wet processing of woven and knitted textiles. Restricted and hazardous textile chemicals (ZDHC, REACH, and RSL concepts). Eco-friendly fibres. Enzymes—classification and role of enzymes in textile processing. Natural dyes—classification, extraction methods, applications, and natural mordants: classification and processing techniques.

UNIT III: Organic and Sustainable Textiles

Organic fibre production and certification systems. Production and processing of organic cotton, wool, silk, bamboo, regenerated fibres (Lyocell), PLA (Polylactic Acid) fibres, and recycled PET fibres. Carbon footprint assessment in the textile and apparel industry. Sustainable manufacturing practices and environmental impact assessment.

UNIT IV: Recycling, Upcycling, Life Cycle Assessment, and Circular Economy

Recycling—definition, methods, processes, and importance. Upcycling—definition, principles, applications, advantages, and limitations. Life Cycle Assessment (LCA)—definition, stages, significance, and applications in textiles. Circular economy—definition, benefits, five pillars, circular design principles, resource efficiency, and implementation in the textile and apparel industry.

UNIT V: Ethical Manufacturing and Corporate Social Responsibility

Ethical issues in the textile and fashion industry. Environmental impacts of textile and apparel manufacturing. Ethical sourcing of sustainable fashion products and accessories. Environmental, Social and Governance (ESG) principles and sustainability reporting. Corporate Social Responsibility (CSR), international sustainability standards, and responsible business practices in the textile and apparel industry.

REFERENCES

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- Miraftab, M., & Horrocks, A. R. (Eds.). (2007). Ecotextiles: The way forward for sustainable development in textiles. Woodhead Publishing.
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- Skelly, J. K. (2003). Water recycling in textile wet processing. Woodhead Publishing.
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- Gwilt, A. (2020). A practical guide to sustainable fashion (2nd ed.). Bloomsbury Publishing.

SEMESTER – I
CORE III
FASHION MERCHANDISING

COURSE OBJECTIVES

- Understand the principles, functions, and strategic role of fashion merchandising in the global apparel and retail industry.
- Analyze consumer behaviour, fashion trends, merchandising planning, buying strategies, and inventory management for effective retail decision-making.
- Apply merchandising budgeting, assortment planning, pricing, and range planning techniques to optimize business performance.
- Evaluate merchandising operations, supplier relationships, sourcing, and omnichannel retail strategies using digital technologies.
- Develop professional competencies in merchandising, communication, negotiation, leadership, and data-driven decision-making for the fashion industry.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Explain the principles, functions, and strategic role of fashion merchandising in the apparel and retail industry.	K2
CO2	Analyze consumer buying behaviour, fashion trends, and merchandising strategies to support merchandising decisions.	K4
CO3	Evaluate the organizational structure, buying functions, sourcing practices, and coordination among merchandising departments within the apparel value chain.	K5
CO4	Apply merchandising budgeting, assortment planning, open-to-buy systems, pricing, and range planning techniques to improve retail performance.	K3
CO5	Evaluate merchandising operations, inventory management, omnichannel retailing, e-commerce, and digital merchandising strategies for sustainable business growth.	K5
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Fundamentals of Fashion Merchandising

Introduction to fashion merchandising. Scope, principles, and functions of merchandising. Fashion business environment. Types of merchandising—fashion, retail, export, buying, sourcing, and visual merchandising. Roles and responsibilities of merchandisers. Fashion value chain. Consumer behaviour and fashion buying process. Fashion forecasting and market intelligence.

UNIT II – Buying and Merchandising Management

Roles and responsibilities of buyers and merchandisers. Buyer–supplier relationships. Buying cycle. Sourcing strategies. Vendor evaluation and selection. Private label and branded merchandising. Product lifecycle management (PLM). Ethical sourcing and sustainable procurement. Skills and competencies of fashion buyers and merchandisers.

UNIT III – Merchandising Organization and Planning

Structure of merchandising and buying departments. Roles of assistant buyer, assistant merchandiser, allocator, planner, and category manager. Merchandise planning process. Assortment planning. Category management. Merchandise calendars. Coordination across the apparel supply chain. Merchandise Information Systems (MIS).

UNIT IV – Merchandise Budgeting and Retail Planning

Merchandising budgets. Sales forecasting. KPI budgeting. Markdown management. Intake margin planning. Stock budgeting. Open-to-Buy (OTB) planning. Merchandise assortment and range planning. Pricing strategies. Inventory control. Retail performance indicators. Data-driven merchandising decisions.

UNIT V – Digital Merchandising and Omnichannel Retailing

Merchandise allocation and replenishment. Supplier relationship management. Size profiling and allocation. Purchase order management. Omnichannel merchandising. E-retailing and digital commerce - E-retailing in product management, stock management and drop shipping activities. Product Information Management (PIM). Customer Relationship Management (CRM). AI-enabled merchandising. Sustainability in merchandising. Emerging trends in fashion retail and digital merchandising.

REFERENCES

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SEMESTER – I
CORE PRACTICAL I

ADVANCED GARMENT CONSTRUCTION PRACTICAL

COURSE OBJECTIVES

- Develop advanced skills in transforming fashion designs into garment patterns through drafting and pattern development techniques.
- Apply material estimation, marker planning, garment costing, construction, and presentation techniques in apparel production.
- Demonstrate professional skills in garment fitting, quality evaluation, alteration, and defect analysis.
- Construct functional, fashionable, and specialized garments that meet diverse consumer and industrial requirements.
- Develop innovative garment solutions for adaptive, protective, and sustainable apparel applications.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Design, draft, construct, and evaluate children's garments using professional construction techniques.	P4
CO2	Design, draft, construct, and evaluate women's garments with appropriate fit, quality, and finishing.	P4
CO3	Design, draft, construct, and evaluate men's garments following industrial standards.	P4
CO4	Develop adaptive and special-purpose garments based on user requirements and ergonomic principles.	P5
CO5	Create complete protective garments by integrating functional design, material selection, construction, and quality evaluation.	P5
P1 – Imitation; P2 – Manipulation; P3 – Precision; P4 – Articulation; P5 – Naturalization		

Designing, Constructing and Evaluating the Garment

- 1. Children's Garments:** Frock/ Middy & MiddyTop/ Boy shirt
- 2. Women's Garments:** Salwar and Kameez/ Maxi
- 3. Men's Garments:** Shirt/ Kurtha
- 4. Adaptive Clothing:** Persons with physical disabilities/ Elderly people/ Maternity wear or Lactation wear
- 5. Protective Clothing:** Medical protective suit with Gloves, Face mask, Head cover, Shoe/foot covers

REFERENCES

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SEMESTER – I
ELECTIVE I
TEXTILES AND APPAREL QUALITY EVALUATION

COURSE OBJECTIVES

- Understand the principles, standards, and quality management systems used in the textile and apparel industry.
- Evaluate fibre, yarn, fabric, and garment quality using national and international testing standards and quality assurance systems.
- Analyze eco-compliance requirements, restricted substances, sustainability standards, and regulatory frameworks for textile and apparel products.
- Apply quality control, inspection, auditing, and statistical quality techniques to improve apparel manufacturing performance.
- Develop professional competencies in quality assurance, product evaluation, customer satisfaction, and continuous quality improvement.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Explain textile and apparel quality management systems, international standards, and Total Quality Management practices.	K2
CO2	Evaluate eco-specifications, restricted substances, sustainability standards, and regulatory compliance for textile and apparel products.	K5
CO3	Analyze garment defects, testing procedures, and quality evaluation methods across apparel manufacturing processes.	K4
CO4	Evaluate care labeling systems, eco-labels, product performance, and international textile care standards.	K5
CO5	Apply quality assurance, quality control, statistical quality techniques, AQL standards, digital quality management, and continuous improvement tools in apparel manufacturing.	K3
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Quality Management Systems in Textiles and Apparel

Concept of quality and quality management. Dimensions of quality. Quality planning, quality assurance, quality control, and quality improvement. Total Quality Management (TQM). International quality standards—ISO 9001, ISO 14001, ISO 45001, SA 8000, WRAP, OEKO-TEX®, GOTS, Bluesign®, Higg Index. British Standards (BS), ASTM, AATCC, and BIS standards.

UNIT II – Eco-Compliance and Sustainable Quality Standards

Eco-specifications for textiles and apparel. Restricted Substance List (RSL) and Manufacturing Restricted Substance List (MRSL). ZDHC programme. REACH regulations. Formaldehyde, heavy metals, phthalates, azo dyes, pesticides, pentachlorophenol (PCP), nickel release, pH requirements, fluorinated compounds (PFAS), colour fastness requirements, eco-friendly chemicals, sustainable finishing agents, and environmental compliance.

UNIT III – Garment Quality Evaluation and Testing

Garment defects and defect classification. Quality evaluation in fabric inspection, cutting, sewing, finishing, and packing departments. Seam quality and seam strength. Sewing thread testing. Bow and skewness. Appearance retention. Dimensional stability. Pilling, abrasion resistance, stain release, wrinkle recovery, garment performance evaluation. Digital quality inspection.

UNIT IV – Product Performance and Care Evaluation

Care labeling systems. American (ASTM), British (BS), ISO, and GINETEX care symbols. Eco-labeling systems. Product performance evaluation. Wear trials. Consumer acceptance testing. Product safety standards. Packaging quality. Product traceability. Digital Product Passport (DPP).

UNIT V – Quality Assurance and Continuous Improvement

Quality assurance systems for garment exports. Functions of QA and QC. Inspection procedures. Acceptance Quality Level (AQL). Statistical Quality Control (SQC). Process capability. Root Cause Analysis (RCA). Corrective and Preventive Actions (CAPA). Quality Cost, Customer complaints and returns analysis. Industry 4.0 applications in apparel quality.

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- Glock, R. E., & Kunz, G. I. (2019). Apparel Manufacturing: Sewn Product Analysis (5th ed.). Pearson.
- Ross, A. (2015). Managing Quality in the Apparel Industry. Woodhead Publishing.
- Mukhopadhyay, A. (Ed.). (2017). Textile and Apparel Quality Assurance. Springer.
- Nayak, R., & Padhye, R. (2015). Garment Manufacturing Technology. Woodhead Publishing.
- Saville, B. P. (2019). Physical Testing of Textiles (2nd ed.). Woodhead Publishing.
- Chuter, A. J. (Latest ed.). Introduction to Clothing Production Management. Wiley-Blackwell.

SEMESTER – I
ELECTIVE I
DESIGN RESEARCH

COURSE OBJECTIVES

- Analyze design research methodologies and identify appropriate primary and secondary sources for fashion design research.
- Evaluate design concepts through creative research, idea generation, and concept development techniques.
- Examine material exploration, three-dimensional experimentation, and design development processes for innovative fashion solutions.
- Develop research-based design collections through critical analysis, refinement, and evaluation of creative ideas.
- Communicate design concepts effectively using professional visualization, illustration, presentation, and documentation techniques.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Explain design research concepts, research methodologies, and primary and secondary sources used in fashion design.	K2
CO2	Analyze research findings to develop mood boards, storyboards, concept boards, and creative design directions.	K4
CO3	Evaluate three-dimensional research approaches, material exploration, draping, and garment manipulation techniques.	K5
CO4	Develop research-based design concepts and refine them into cohesive fashion collections.	K6
CO5	Critically communicate and present design ideas using professional illustration, visualization, and presentation techniques.	K5
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Introduction to Design Research

Design research—definition, objectives, scope, and importance. Types of design briefs. Research methodologies in fashion design. Primary and secondary research sources. Theme selection, concept development, and sources of inspiration.

UNIT II – Research Compilation and Concept Development

Methods of compiling design research. Sketchbooks, drawing, collage, juxtaposition, deconstruction, cross-referencing, and research analysis. Mood boards, storyboards, concept boards, trend analysis, and visual research documentation.

UNIT III – Three-Dimensional Design Research

Three-dimensional approaches to design research. Model making, draping, fibre and fabric exploration, textile manipulation, recycled garment development, material experimentation, and sustainable design exploration.

UNIT IV – Design Development

Design development from research findings. Bridging research and design. Design elements, creative thinking techniques, idea generation, design refinement, collection planning, editing, and evaluation of fashion collections.

UNIT V – Design Communication

Design communication methods. Fashion sketching, technical drawing, rendering techniques, templates, collage, layout and composition, fashion illustration, visual presentation, and digital communication of design concepts.

REFERENCES

- Seivewright, S. (2012). Basics Fashion Design 01: Research and Design (2nd ed.). AVA Publishing.
- Renfrew, E., & Renfrew, C. (2009). Basics Fashion Design 04: Developing a Collection. AVA Publishing.
- Kawamura, Y. (2011). Doing Research in Fashion and Dress: An Introduction to Qualitative Methods. Berg Publishers.
- Hopkins, J. (2009). Basics Fashion Design 05: Fashion Drawing. AVA Publishing.
- Mbonu, E. (2014). Fashion Design Research. Laurence King Publishing.
- McKelvey, K., & Munslow, J. (2012). Fashion Design: Process, Innovation and Practice (2nd ed.). Wiley-Blackwell.
- Renfrew, E., & Renfrew, C. (2014). Developing a Fashion Collection. Fairchild Books.

SEMESTER – I
SKILL ENHANCEMENT COURSE I
FASHION SKETCHING PRACTICALS

COURSE OBJECTIVES

- Develop professional fashion sketching skills by constructing fashion figures using appropriate body proportions, poses, and rendering techniques.
- Apply advanced illustration techniques to create contemporary garment designs, fashion presentations, and live model sketches.
- Create professional fashion illustrations for garments, fashion accessories, and home furnishing products using various sketching and colouring media.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Construct professional fashion figures using gesture, stick, block, and fleshy figure techniques with appropriate body proportions and dynamic poses.	P4
CO2	Develop contemporary fashion illustrations by applying freehand sketching, rendering, colouring, shading, and live model drawing techniques.	P5
CO3	Create professional fashion presentations incorporating garment illustrations, fashion accessories, and home furnishing designs using appropriate finishing and presentation techniques.	P5
P1 – Imitation P2 – Manipulation P3 – Precision P4 – Articulation P5 – Naturalization		

PRACTICAL EXERCISES

Exercise I – Fashion Figure Construction

- Gesture drawing - Body components from head to toe
- 10-head stick, block, and fleshy figures
- Fashion poses (Straight, S-Curve, Open, T-Pose)
- Stylized fashion illustration - Contemporary 12-head fashion figures

Exercise II – Professional finishing and presentation techniques

- Freehand drawing techniques
- Pencil rendering
- Colour pencil rendering
- Live model drawing
- 2D and 3D fashion illustration

Exercise III – Fashion Product Illustration

- Fashion accessory illustration (Any five)
- Home furnishing product illustration (Any five)

REFERENCE BOOKS

- Abling, B. (2018). Fashion Sketchbook (7th ed.). Fairchild Books.
- Seaman, J. (2003). Professional Fashion Illustration. B. T. Batsford Ltd.
- Ireland, P. J. (1996). Fashion Design Drawing and Presentation. B. T. Batsford Ltd.
- Allen, A., & Seaman, J. (1998). Fashion Drawing: The Basic Principles. B. T. Batsford Ltd.
- Hopkins, J. (2019). Fashion Drawing (2nd ed.). Bloomsbury Publishing.
- Drake, N. (2020). Fashion Illustration: Techniques and Inspiration. Laurence King Publishing.

SEMESTER – II
CORE IV
TECHNICAL TEXTILES

COURSE OBJECTIVES

- Understand the classification, properties, and recent developments of fibres used in technical textiles.
- Explain the structure, characteristics, and applications of technical textiles used in medical, agricultural, industrial, construction, and transportation sectors.
- Develop knowledge of protective, sports, and smart textiles for specialized applications.
- Analyze the functional requirements and performance characteristics of various technical textile products.
- Create awareness of emerging trends, innovations, and future opportunities in the technical textile industry.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Explain the scope, classification, fibres, and applications of technical textiles.	K2
CO2	Describe the fibres, properties, functions, and applications of medical and agro textiles.	K2
CO3	Analyze the characteristics and applications of buildtech, geotech, and indutech textiles.	K4
CO4	Explain the materials, properties, and applications of protective and mobiltech textiles.	K2
CO5	Evaluate the applications of sportech, smart textiles, and intelligent textile materials in advanced textile products.	K5
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Introduction to Technical Textiles and Advanced Technical Fibres

Technical Textiles: Definition, developments in fibres used in technical textiles, Applications of technical textiles, Globalization, market trends, and future prospects of the technical textile industry. **Technical Fibres:** High – Strength and high-modulus organic fibres, high chemical and combustion - Resistant organic fibres, high performance inorganic fibres, ultra-fine and novelty fibres.

UNIT II – Medical and Agro Textiles

Medical Textiles: Classification – fibres Used. Non –Implantable, implantable, Extra Corporeal Devices, Health Care and Hygienic Products. **Agro Textiles** – Introduction, fibres used, classification, functions, properties, characteristics, and applications in agriculture, horticulture, floriculture, and crop protection.

UNIT III – BuildTech, GeoTech and InduTech

Build Tech - Introduction, Fibres Used, types functions and properties, characteristics and applications in Architecture and in Building Construction. **Geotextiles** – Introduction, Fibres Used, types functions and properties characteristics and applications in its Field. **Indu Tech**—Introduction, Fibres Used, types functions and properties, characteristics and applications – Industrial filtration and dust collection textiles.

UNIT IV – Protective and MobilTech Textiles

Protective Textiles: Introduction, Fibres Used, types functions and properties, characteristics and applications fire protective clothing, heat resistant garments, water proof Materials, ballistic resistant vest. Biological and Chemical Vest, Military protective Clothing. **Mobiltech Textiles**—Introduction, Fibres Used, types functions and properties, characteristics and applications of mobile tech, Applications in road vehicles, railways, aerospace, marine, and automotive sectors.

UNIT V – Sports, Smart and Intelligent Textiles

Sports Textiles: Introduction, fibers used, Types, functions and properties, Characteristics and Applications of Sports Tech. **Smart and intelligent textiles**—classification, active, passive, and ultra-smart textiles; phase change materials, shape memory polymers, chromic materials, conductive textiles, wearable textiles, and their applications.

REFERENCES

- Kothari, V. K. (2008). Technical Textiles: Technology, Developments and Applications. IAFL Publications, New Delhi.
- Mattila, H. R. (2006). Intelligent Textiles and Clothing. Woodhead Publishing, Cambridge.
- Hearle, J. W. S. (2001). High-Performance Fibres. Woodhead Publishing, Cambridge.
- Senthil Kumar, R. (2013). Textiles for Industrial Applications. CRC Press.
- Adanur, S. (Ed.). (1995). Wellington Sears Handbook of Industrial Textiles. CRC Press.
- Anand, S. C. (Ed.). (2010). Handbook of Technical Textiles (2nd ed.). Woodhead Publishing.
- Shishoo, R. (Ed.). (2005). Textiles in Sport. Woodhead Publishing.

SEMESTER – II
CORE V
NANO TECHNOLOGY IN TEXTILES

COURSE OBJECTIVES

After completing this course, students will be able to:

- Analyze the fundamental principles, synthesis techniques, and properties of nanomaterials used in textile applications.
- Evaluate advanced characterization techniques for determining the structure, morphology, and functional properties of textile nanomaterials.
- Examine the development and performance of nanofibres, nanocomposites, and carbon-based nanomaterials for advanced textile applications.
- Assess the application of metallic and functional nanomaterials in developing multifunctional and high-performance textile products.
- Critically evaluate emerging nanotechnologies, industrial applications, sustainability, and safety aspects of nanotechnology in the textile and apparel industry.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Analyze the principles, synthesis methods, and functional properties of nanomaterials used in textile engineering.	K4
CO2	Evaluate advanced characterization techniques for analysing the structure and properties of textile nanomaterials.	K5
CO3	Examine the production, properties, and applications of nanofibres, nanocomposites, and carbon-based nanomaterials in textiles.	K4
CO4	Assess the performance of metallic and metal oxide nanoparticles in imparting multifunctional properties to textile materials.	K5
CO5	Critically evaluate industrial applications, environmental impacts, safety concerns, and future developments of nanotechnology in textiles.	K5
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Fundamentals of Nanotechnology

Introduction to nanotechnology and nanoscale materials. Classification, structure, and properties of nanomaterials. Approaches to nanomaterial synthesis (top-down and bottom-up). Physical, chemical, and biological methods of nanoparticle synthesis. Role of nanotechnology in advanced textile materials, functional apparel, and technical textiles.

UNIT II – Characterization of Nanomaterials

Principles of nanomaterial characterization. Surface and morphological analysis using Scanning Electron Microscopy (SEM), Field Emission Scanning Electron Microscopy (FESEM), Transmission Electron Microscopy (TEM), and Atomic Force Microscopy (AFM). Structural characterization using X-ray Diffraction (XRD). Spectroscopic techniques including Fourier Transform Infrared Spectroscopy (FTIR) and UV–Visible Spectroscopy. Particle size analysis using Dynamic Light Scattering (DLS) and zeta potential measurement.

UNIT III – Nanofibres and Nanostructured Textile Materials

Introduction to nanofibres, properties, and applications. Electrospinning technology—principle, process parameters, and nanofibre production. Carbon-based nanomaterials including carbon nanotubes (CNTs) and graphene. Nanocomposites and nanocoatings for textile applications. Smart textiles, wearable textiles, and recent developments in nanostructured textile materials.

UNIT IV – Metallic and Functional Nanomaterials in Textiles

Metallic and metal oxide nanoparticles used in textiles, including silver, zinc oxide, titanium dioxide, silica, copper oxide, and magnesium oxide nanoparticles. Methods of synthesis and incorporation into textile substrates. Functional textile finishes such as antimicrobial, UV-protective, self-cleaning, water-repellent, flame-retardant, and anti-odour finishes. Performance evaluation, durability, safety, and environmental aspects of nanomaterials.

UNIT V – Applications of Nanotechnology in Textile Processing

Applications of nanotechnology in textile processing and finishing. Nano-finishing techniques, nano-coatings, and multifunctional textile finishes. Nano-enabled protective clothing, medical textiles, filtration textiles, and smart wearable systems. Green synthesis of nanoparticles, sustainable nanotechnology, industrial commercialization, regulatory and safety aspects, and future trends in nanotechnology for textiles.

REFERENCES

- Bhushan, B. (Ed.). (2017). Springer handbook of nanotechnology (4th ed.). Springer.
- Gopalakrishnan, K., & Suguna, M. (2018). Nanotechnology in Textiles: Concepts, Applications and Commercialization. CRC Press.
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- Mahltig, B., & Textor, T. (2008). Nanosols and Textiles. World Scientific Publishing.
- Mao, N. (Ed.). (2019). Nanotechnology for Textiles. Woodhead Publishing.
- Bhushan, B. (2010). Introduction to Nanotechnology. Springer.
- Additional Recommended References
- Kelly, F. M., & Johnston, J. H. (2011). Nano-scale Surface Modifications for Enhanced Performance of Textiles. Woodhead Publishing.
- Ul-Islam, S., & Butola, B. S. (Eds.). (2020). Advances in Functional and Protective Textiles. Woodhead Publishing.
- Paul, R. (Ed.). (2019). High Performance Technical Textiles. Wiley.
- Joshi, M., & Adak, B. (Eds.). (2019). Advances in Functional Finishing of Textiles. Springer.

SEMESTER – II
CORE PRACTICAL II

CAD IN TEXTILE DESIGNING PRACTICALS

COURSE OBJECTIVES

- Develop advanced weave structures and textile designs using CAD software for woven fabric development.
- Design creative woven textile products, including striped, checked, and jacquard-based designs, using professional CAD software.
- Create innovative saree borders, pallus, bodice designs, and presentation layouts using textile and graphic design software.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Develop basic and advanced woven structures using textile CAD software.	P4
CO2	Create striped, checked, and jacquard-inspired woven textile designs using professional CAD tools.	P5
CO3	Produce digitally designed saree borders, pallus, bodice layouts, and presentation sheets using textile design software.	P5
P1 – Imitation; P2 – Manipulation; P3 – Precision; P4 – Articulation; P5 – Naturalization		

Prerequisite

Basic knowledge of woven fabric construction, weave notation, drafting, and textile design.

Software (Any One): WeavePoint, WeaveIt Pro, DB Weave, Dobby Weave, Jacquard Design Software, Adobe Illustrator, Adobe Photoshop

Practical Exercises

Exercise I – Woven Structure Development Using CAD

Create the following weave structures using Textile CAD software:

- Plain weave
- Twill weaves (2/1, 1/2, 3/1, 1/3, 2/2, 2/3)
- Pointed twill
- Herringbone twill
- Combined twill
- Huck-a-back weave
- Ordinary and Brighton honeycomb weaves
- Mock leno weave

Exercise II – Decorative Woven Design Development

- Develop woven designs using Textile CAD software for:
- Striped fabrics (Pin stripe, Bengal stripe, Bar stripe, Barcode stripe)
- Checked fabrics (Checkerboard, Madras checks, Tartan checks)
- Jacquard-inspired woven motifs (optional)

Exercise III – Saree Design Using CAD

- Design and develop a complete saree collection comprising:
- Saree border
- Pallu
- Bodice design
- Colourway and presentation layout

REFERENCES

- Hu, J. (2011). Computer Technology for Textiles and Apparel. Woodhead Publishing.
- Singh, S. (1998). Computer Aided Design and Manufacturing. Khanna Publishers.
- Gandhi, K. (2019). Woven Textiles: Principles, Technologies and Applications (2nd ed.). Woodhead Publishing.
- Gokarneshan, N. (2004). Fabric Structure and Design. New Age International Publishers.
- Spencer, D. J. (2001). Knitting Technology (3rd ed.). Woodhead Publishing.

- Nayak, R., & Padhye, R. (2018). Automation in Garment Manufacturing. Woodhead Publishing.
- Hu, J. (Ed.). (2008). Intelligent Textiles and Clothing. Woodhead Publishing.
- Adobe Inc. (Latest ed.). Adobe Illustrator Classroom in a Book. Adobe Press.
- Adobe Inc. (Latest ed.). Adobe Photoshop Classroom in a Book. Adobe Press.
- Dawson, T. (2013). The Weaver's Studio: Doubleweave. Interweave Press.

SEMESTER – II
CORE PRACTICAL III

ADVANCED DRAPING TECHNIQUES PRACTICAL

COURSE OBJECTIVES

- Develop advanced draping skills by preparing muslin (calico), understanding fabric grain, and translating design concepts into three-dimensional garment forms.
- Apply professional draping techniques to construct skirts, blouses, trousers, and knitwear with appropriate fit, balance, and silhouette.
- Demonstrate advanced bias draping techniques to create innovative garment styles with enhanced fit, movement, and aesthetic appeal.
- Produce professionally draped garment prototypes by integrating pattern development, fitting, and garment evaluation techniques.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Prepare muslin, identify grain lines, and develop accurate draped garment foundations.	P4
CO2	Drape, fit, and construct skirts, blouses, trousers, and knit garments using advanced draping techniques.	
CO3	Apply bias draping techniques to develop innovative garment designs with appropriate balance and silhouette.	P5
CO4	Produce and evaluate professionally draped garment prototypes with industry-standard fit and finishing.	P5
P1 – Imitation; P2 – Manipulation; P3 – Precision; P4 – Articulation; P5 – Naturalization		

Practical Exercises

Exercise I – Foundation Draping Techniques

- Preparation of muslin (calico)
- Identification and application of grain lines
- Draping along straight grain, cross grain, and bias grain
- Visual comparison of muslin and fashion fabrics

Exercise II – Advanced Draping of Garments

Develop and construct the following garments using draping techniques:

- Skirts (Kilt, Dirndl, Straight, A-line, Bias Circle)
- Yoked skirt with gathers or flare
- Blouses (Peasant blouse, Gibson Girl blouse, Tunic with bell sleeves)

Exercise III – Draping of Trousers and Knitwear

Develop and construct:

- Harem trousers
- Wide-leg trousers with front tucks
- Cotton knit top with ribbed neckline

Exercise IV – Advanced Bias Draping

Develop garments using bias draping techniques:

- Bias-draped camisole
- Bias chemise with princess line
- Fit analysis, refinement, and final evaluation of draped garments

REFERENCES

- Kiisel, K. (2013). *Draping: The Complete Course*. Laurence King Publishing.
- Jaffe, H., & Relis, N. (2016). *Draping for Fashion Design* (5th ed.). Pearson.
- Crawford, C. A. (2012). *The Art of Fashion Draping* (3rd ed.). Fairchild Books.
- Joseph-Armstrong, H. (2019). *Patternmaking for Fashion Design* (6th ed.). Pearson.
- Aldrich, W. (2015). *Metric Pattern Cutting for Women's Wear* (6th ed.). Wiley-Blackwell.
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- Ireland, P. J. (2008). *New Encyclopedia of Fashion Details*. Pavilion Books.
- Renfrew, E., & Renfrew, C. (2014). *Developing a Fashion Collection*. Fairchild Books.

SEMESTER – II
ELECTIVE II
IMPORT EXPORT MANAGEMENT AND DOCUMENTATION

COURSEOBJECTIVES

- Understand the principles, policies, procedures, and regulatory framework governing international trade and import-export management.
- Develop knowledge of export-import documentation, customs procedures, logistics, international payment systems, and export promotion schemes.
- Analyze global trade practices, supply chain management, trade agreements, and digital trade systems to enhance international business competitiveness.
- Evaluate government support measures, export finance, and institutional assistance available for promoting exports.
- Develop professional competencies in export documentation, trade compliance, negotiation, and international business management.

COURSEOUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Explain the principles of international trade, foreign trade policy, import-export management, and the global business environment.	K2
CO2	Apply export and import procedures, customs regulations, documentation, and international commercial terms for global trade operations.	K3
CO3	Analyze export promotion schemes, government assistance, institutional support, and international trade agreements for export competitiveness.	K4
CO4	Evaluate international logistics, shipping procedures, customs clearance, export finance, and risk management in import-export business.	K5
CO5	Apply digital trade documentation, electronic customs systems, international payment mechanisms, and sustainable trade practices in export-import management.	K3
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Fundamentals of Import and Export Management

Import Export Management Introduction; Concept Key Feature; Foreign Trade - Institutional Framework and Basics; Trade Policy; Foreign Trade -Simplification of Document; Reduction in Document to Five for Custom Purpose – Exporting and Importing Counter Trade- Promise and Pitfall of Exporting; Improving Export Performance - Counter Trade.

UNIT II – Export and Import Procedures

Export Procedures - Preparation for exports: Registration of firms with authorities, PAN No., IE code, BIN No., EPC, Central Excise etc.,- Category of exports: Direct, indirect, third party exports.- Category of Exporters: Manufacturer exporter, merchant exporter, EOU/SEZ/ - Five types of Export Houses - Export benefits: Duty drawback, advance authorization scheme, duty free import authorization, duty exemption entitlement scheme, EPCG, duty entitlement pas book scheme, market development assistance - GSP and GSTP rules as per the FT policy.

UNIT III – Export Promotion and Institutional Support

Import Procedures – Import management, procurement planning, and project imports regn. - Identification, selection of suppliers – Purchase contract, terms of payments – Terms of Delivery Inco terms- Import policy ITC HS- Role of a customs house agent and freight forward agents- Type of customs duties, valuation rules- Complete documentation and procedures for import clearance at sea port- Customs clearance of imports by sea and air documents, procedures. etc. -Imports under various imports notification issued by customs.

UNIT IV – International Logistics and Export Finance

Export Assistance of India: Introduction, Importance of Export Assistance, Export Promotion Measure in India- Expansion of Production Base for Exports; Relaxation in Industrial Licensing Policy /MRT/ FER/ Foreign Collaborations; Liberal Import of Capital Goods; EPZ / EOU -Assured Supply of Raw-Material Imports -Eligibility for Export/ Trading/Star Trading/Super Star Trading Houses - Export Houses Status for Export of Services- Rendering Exports Price Competitive; Fiscal Incentives; Financial Incentives; Strengthening Export Marketing Effort.

UNIT V – Export Documentation and Digital Trade

Export documentation – commercial invoice, packing list, certificate of origin, shipping bill, bill of lading, airway bill, inspection certificate, insurance certificate, GSP certificate, e-documentation, digital signatures, electronic data interchange, block chain in international trade, customs compliance, digital trade platforms, sustainable supply chain documentation, and emerging trends in global trade.

TEXT BOOKS

- Ramagopal, C. (2021). Export Import Procedures. New Age International Publishers.
- Johnson, T. E., & Bade, D. L. (2022). Export/Import Procedures and Documentation. American Management Association.
- Jain, K. S. (2021). Foreign Trade: Theory, Procedures, Practices and Documentation. Himalaya Publishing House.
- Seyoum, B. (2022). Export-Import Theory, Practices, and Procedures (3rd ed.). Routledge.

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- Daniels, J. D., Radebaugh, L. H., & Sullivan, D. P. (2021). International Business: Environments and Operations (17th ed.). Pearson.
- Wild, J. J., & Wild, K. L. (2020). International Business (9th ed.). Pearson.
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- World Trade Organization. (Latest Edition). World Trade Report. WTO.
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- Reserve Bank of India. (Latest Edition). Master Directions on Export of Goods and Services. RBI.

SEMESTER II

ELECTIVE III

ENTREPRENEURSHIP DEVELOPMENT IN TEXTILES

COURSE OBJECTIVES

- Understand the principles, process, and opportunities of entrepreneurship in the textile, apparel, and fashion industries.
- Develop business planning, financial management, and resource mobilization skills for establishing and managing textile and fashion enterprises.
- Analyze government support systems, legal requirements, sustainability practices, and digital business models for entrepreneurial success.
- Apply innovation, leadership, marketing, and strategic management skills to develop competitive fashion businesses.
- Develop entrepreneurial competencies for creating sustainable, technology-driven, and globally competitive textile and apparel enterprises.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Explain the concepts, characteristics, opportunities, and entrepreneurial ecosystem of the textile and fashion industry.	K2
CO2	Apply business planning, financial management, project appraisal, and funding strategies to establish textile and apparel enterprises.	K3
CO3	Analyze plant location, facility planning, production systems, and operational management for textile and apparel businesses.	K4
CO4	Evaluate the role of government support institutions, startup ecosystems, incubation centres, and entrepreneurship development programmes.	K5
CO5	Apply legal, taxation, intellectual property, sustainability, and ethical business practices for successful entrepreneurship.	K3
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Entrepreneurship in Textile and Fashion Industry

Entrepreneurship: Meaning – Analysis – Types and Functions – Growth of entrepreneurs in India – Influence of Environmental Factors – Help in EDP – training and development of entrepreneur. Entrepreneurship development programme – role of entrepreneurs in development of apparel and fashion industry, entrepreneurship with reference to fashion and apparel industry in India.

UNIT II – Business Planning and Financial Management

Business opportunity identification. Business plan preparation. Feasibility analysis. Business model development (Business Model Canvas). Forms of business ownership. Registration procedures. Financial planning. Working capital management. Cost estimation. Project appraisal. Sources of finance. Venture capital. Angel investors. Startup India. Bank finance. Project financing.

UNIT III – Plant Location and Operations Management

Plant location and site selection. Facility planning. Plant layout. Material handling systems. Ergonomics. Workplace safety. Production planning and control. Inventory management. Supply chain management. Lean manufacturing. Industry 4.0 concepts in textile enterprises. Sustainable manufacturing practices.

UNIT IV – Entrepreneurship Support Systems

Government support institutions: DIC, MSME, SIDBI, NSIC, NIESBUD, SIDCO, SISI, AEPC, ATDC, TEXPROCIL, PDEXCIL, Apparel Export Promotion Council (AEPC). Incubation centres. Startup India. Stand-Up India. PMEGP. MUDRA. Technology Upgradation Fund Scheme (TUFS/ATUFS). Cluster development programmes. Export promotion schemes. Institutional support for fashion startups.

UNIT V – Legal, Taxation and Sustainable Entrepreneurship

GST and taxation for textile enterprises. Labour laws. Factory Act. Minimum Wages Act. Intellectual Property Rights (IPR), patents, trademarks, copyrights, industrial designs, and geographical indications. Environmental regulations. ESG principles. Corporate Social Responsibility (CSR). Sustainable entrepreneurship. Circular business models. Ethical business practices. Digital business regulations.

REFERENCE BOOKS

- Khanka, S. S. (2022). Entrepreneurial Development (Latest ed.). S. Chand Publishing.
- Desai, V. (2021). Small Scale Industries and Entrepreneurship. Himalaya Publishing House.

- Hisrich, R. D., Peters, M. P., & Shepherd, D. A. (2020). *Entrepreneurship* (11th ed.). McGraw-Hill Education.
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SEMESTER – II
NON MAJOR ELECTIVE COURSE I
HAND EMBROIDERY PRACTICALS

COURSE OBJECTIVES

- Develop practical skills in executing basic and decorative hand embroidery stitches.
- Apply traditional Indian embroidery techniques to create decorative textile products.
- Design and produce functional and aesthetic embroidered articles using appropriate stitches and finishing techniques.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Perform basic hand embroidery stitches, including flat, loop, and knotted stitches, with accuracy and neatness.	P3
CO2	Execute traditional Indian embroidery techniques to produce region-specific decorative designs.	P4
CO3	Design and create functional embroidered products by integrating appropriate embroidery techniques, colour combinations, and finishing methods.	P5
P1 – Imitation; P2 – Manipulation; P3 – Precision; P4 – Articulation; P5 – Naturalization		

PRACTICAL EXERCISES

Exercise I – Basic Hand Embroidery Stitches

Practice the following embroidery stitches:

- **Flat Stitches:** Running stitch, Back stitch, Double back stitch, Stem stitch, Satin stitch, Cross stitch, Herringbone stitch, Couching stitch
- **Loop Stitches:** Chain stitch, Lazy daisy stitch, Buttonhole stitch, Blanket stitch, Fishbone stitch, Feather stitch, Double feather stitch, Fly stitch, Cretan stitch, Romanian stitch
- **Knotted Stitches:** French knot, Bullion knot, Double knot stitch

Exercise II – Traditional Indian Embroidery

Practice selected traditional embroidery techniques:

- Phulkari – Punjab
- Kantha – West Bengal

- Kashida – Kashmir
- Chikankari – Lucknow
- Kutch Embroidery – Gujarat
- Kasuti – Karnataka

Exercise III – Embroidered Product Development

Design and prepare one functional or decorative article using suitable hand embroidery or traditional embroidery techniques.

Suggested products: Cushion cover, Saree panel or border, Handkerchief, Blouse neckline, Dupatta, Kameez neckline, Table runner, Wall hanging, Tote bag, Any similar decorative textile article

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SEMESTER – III

CORE VI

RESEARCH METHODOLOGY AND STATISTICS IN TEXTILES

COURSE OBJECTIVES

To make the students

- Analyze research methodologies, research designs, and ethical principles applicable to textile and apparel research.
- Evaluate research problems, variables, hypotheses, sampling techniques, and data collection methods for scientific investigations.
- Apply appropriate statistical techniques and analytical tools for interpreting research data and drawing valid conclusions.
- Develop technical writing skills for preparing research proposals, dissertations, journal articles, and scientific presentations using appropriate referencing and citation styles.
- Critically evaluate research findings and statistical evidence to support decision-making in textile and apparel research.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Analyze research concepts, methodologies, research problems, and ethical issues in textile and apparel research.	K4
CO2	Evaluate research variables, hypotheses, research designs, and sampling techniques for scientific investigations.	K5
CO3	Analyze and interpret quantitative and qualitative data using appropriate data collection and statistical methods.	K4
CO4	Develop research proposals, technical reports, dissertations, and scientific publications using appropriate referencing and citation standards.	K6
CO5	Apply descriptive and inferential statistical techniques to analyze research data and support evidence-based decision-making.	K3
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Fundamentals of Research Methodology

Research—meaning, objectives, scope, significance, and types of research. Research process. Literature review—sources, search strategies, systematic review, critical analysis, and research ethics. Research problem formulation—identification, selection, scope, objectives, characteristics of a good research problem, and limitations. Introduction to research ethics and responsible conduct of research.

UNIT II – Research Design and Experimental Planning

Research variables and types of variables. Concepts of control, confounding variables, hypotheses, experimental and non-experimental research, experimental and control groups, treatments, and experimental units. Research designs—exploratory, descriptive, diagnostic, experimental, and hypothesis-testing designs. Principles of experimental design, sampling techniques, sample size determination, and survey design.

UNIT III – Data Collection and Data Analysis

Methods of data collection. Primary and secondary data sources. Observation, interviews, questionnaires, schedules, surveys, and experimental methods. Data editing, coding, classification, tabulation, and validation. Data presentation using tables, charts, graphs, and statistical software. Interpretation of research findings.

UNIT IV – Scientific Writing and Research Publication

Technical writing and scientific communication. Research proposals, dissertations, theses, journal articles, review papers, conference papers, posters, and technical reports. Referencing styles (APA, MLA, Chicago, IEEE), citation management, indexing, impact factor, h-index, plagiarism, intellectual property rights (IPR), copyright, patents, and ethics in scholarly publishing.

UNIT V – Statistical Analysis for Textile Research

Descriptive statistics—percentage, mean, median, mode, variance, standard deviation, standard error, skewness, kurtosis, and rank correlation. Inferential statistics—t-tests (one-sample, independent, paired), Chi-square test, ANOVA, correlation and regression analysis (linear and multiple), non-parametric tests (sign test, rank test, concordance test). Statistical process control, control charts for variables and attributes, process capability analysis, and interpretation of statistical results.

REFERENCES

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SEMESTER – III
CORE VII
TEXTILE TESTING

COURSE OBJECTIVES

- Understand the principles, standards, and environmental conditions governing textile testing and quality evaluation.
- Analyze the physical and mechanical properties of fibres, yarns, and fabrics using standard textile testing instruments and international testing methods.
- Evaluate colour fastness, appearance, and performance characteristics of textile materials using standardized testing procedures and instrumental assessment techniques.
- Apply national and international textile testing standards for quality assurance and product evaluation.
- Interpret textile testing results for quality control, product development, and research applications.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Explain the principles of textile testing, standard atmospheric conditions, and national and international testing standards used in textile quality evaluation.	K2
CO2	Evaluate the physical and mechanical properties of textile fibres using standardized testing instruments and modern fibre characterization techniques.	K5
CO3	Analyze yarn quality parameters using conventional and computerized yarn testing methods.	K4
CO4	Evaluate the physical, mechanical, and comfort properties of woven and knitted fabrics using standard laboratory testing procedures.	K5
CO5	Assess colour fastness properties using standard testing methods and instrumental colour measurement techniques for textile quality assurance.	K5
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Fundamentals of Textile Testing

Introduction to textile testing—definition, objectives, importance, and classification of textile testing. Quality assurance and quality control. National and international testing standards (BIS, ASTM, ISO, AATCC). Standard atmospheric conditions for textile testing. Humidity and moisture relationships. Moisture content and regain. Measurement of humidity using wet and dry bulb hygrometer and sling hygrometer. Determination of moisture content and regain by conditioning oven method.

UNIT II – Fibre Testing

Cotton fibre length determination by Baer Sorter. Fibre fineness by Sheffield Micronaire. Fibre maturity by caustic soda swelling method. Fibre strength by Stelometer. Determination of trash and lint by Shirley Trash Analyzer.

UNIT III – Yarn Testing

Yarn numbering systems. Yarn count determination using Quadrant Balance. Yarn strength testing (CRT, CRE, CRL principles), Single Yarn Strength Tester, Lea Strength Tester. Yarn twist measurement. Yarn evenness and imperfections using Uster Evenness Tester. Yarn hairiness, yarn crimp.

UNIT IV – Fabric Testing

Fabric weight (GSM), cover factor, thickness, tensile strength, tearing strength, bursting strength, abrasion resistance (Martindale), pilling resistance (ICI Pill Box), stiffness (Shirley Stiffness Tester), drape, crease recovery, air permeability (Shirley Air Permeability Tester), dimensional stability, comfort properties, and introduction to Kawabata Evaluation System (KES) and FAST fabric evaluation systems.

UNIT V – Colour Fastness and Instrumental Evaluation

Importance of colour fastness. Factors affecting colour fastness. Colour fastness to rubbing (dry and wet), perspiration (acid and alkaline), washing, water, light, pressing, sublimation, dry cleaning, and chlorinated water. Grey scales for colour change and staining. Instrumental colour measurement using spectrophotometers.

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SEMESTER – III
CORE PRACTICAL IV
TEXTILE TESTING PRACTICAL

COURSE OBJECTIVES

- Develop practical skills in conducting standard textile testing procedures for fibres, yarns, and fabrics under standard atmospheric conditions.
- Perform physical, mechanical, and dimensional testing of textile materials using standard laboratory instruments.
- Evaluate colour fastness properties and interpret textile testing results in accordance with national and international testing standards.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Perform fibre, yarn, and fabric testing using standard laboratory equipment and testing procedures.	P4
CO2	Evaluate the physical, mechanical, and dimensional properties of textile materials through standard testing methods.	P5
CO3	Assess colour fastness properties and interpret textile testing results using appropriate testing standards and grey scale evaluation.	P5
P1 – Imitation P2 – Manipulation P3 – Precision P4 – Articulation P5 – Naturalization		

PRACTICAL EXERCISES

Exercise I – Yarn and Fabric Physical Testing

- Determination of lea strength using lea strength tester
- Determination of yarn crimp percentage
- Determination of fabric weight (GSM)
- Determination of fabric thickness
- Determination of fabric shrinkage

Exercise II – Fabric Mechanical Performance Testing

- Determination of tensile strength
- Determination of tearing strength
- Determination of bursting strength

- Determination of fabric stiffness
- Determination of crease recovery
- Determination of abrasion resistance
- Determination of fabric drape

Exercise III – Colour Fastness Evaluation

- Colour fastness to rubbing (Crockmeter)
- Colour fastness to perspiration (Perspirometer)
- Colour fastness to laundering (Laundrometer)
- Colour fastness to pressing
- Assessment and interpretation of colour change and staining using Grey Scale standards

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SEMESTER – III
CORE PRACTICAL V
FASHION PORTFOLIO PRACTICAL

COURSE OBJECTIVES

- Develop professional fashion portfolios by integrating fashion forecasting, cultural inspirations, and innovative design concepts.
- Apply appropriate design principles in the selection of colours, fabrics, trims, accessories, and garment components for cohesive fashion collections.
- Produce complete garment collections and professionally present them through portfolio documentation, garment construction, and fashion presentation.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Develop professional fashion portfolios incorporating concept development, forecasting, and design presentation techniques.	P4
CO2	Create coordinated fashion collections through appropriate selection of colours, fabrics, trims, accessories, illustrations, and garment components.	P5
CO3	Produce finished garments and present complete fashion portfolios through professional documentation and fashion presentation.	P5
P1 – Imitation P2 – Manipulation P3 – Precision P4 – Articulation P5 – Naturalization		

PRACTICAL EXERCISES

Exercise I – Fashion Portfolio Development

- Develop a fashion portfolio based on Fashion Forecasting.

Exercise II – Cultural Fashion Portfolio

- Develop a fashion portfolio inspired by Indian Tradition.

Exercise III – Creative Fashion Portfolio

- Develop a fashion portfolio based on Individual Creativity.

Each portfolio shall include the following:

- Design Development Board
- Theme Board
- Story Board
- Mood Board
- Inspiration Board
- Customer Profile
- Flat Sketches
- Fashion Illustration Board
- Component Board
- Colour Board
- Fabric Board
- Accessories Board
- Ornament Board
- Garment Construction
- Professional Photoshoot and Fashion Presentation

REFERENCES

- Renfrew, E., & Renfrew, C. (2014). Developing a Fashion Collection. Fairchild Books.
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SEMESTER – III
ELECTIVE III
DIGITAL MARKETING

COURSE OBJECTIVES

- Analyze digital marketing strategies and consumer behaviour in the textile and fashion industry.
- Evaluate digital branding, e-commerce, social media marketing, and online advertising techniques for fashion businesses.
- Apply digital marketing tools, analytics, and customer relationship management to enhance brand performance and customer engagement.
- Assess emerging technologies, including Artificial Intelligence (AI), marketing automation, and data-driven decision-making in digital fashion marketing.
- Develop integrated digital marketing campaigns for sustainable growth of textile and fashion brands.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Analyze digital marketing concepts, consumer behaviour, branding strategies, and digital marketing channels in the textile and fashion industry.	K4
CO2	Evaluate fashion e-commerce systems, website management, user experience, and digital retail strategies.	K5
CO3	Develop integrated social media marketing strategies, digital content, influencer campaigns, and brand storytelling for fashion businesses.	K6
CO4	Assess search engine optimization, search engine marketing, online advertising, and digital campaign management techniques for fashion brands.	K5
CO5	Critically evaluate digital marketing performance using analytics, CRM, AI-powered marketing tools, and sustainable digital branding strategies.	K5
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Digital Marketing for Fashion Business

Introduction to digital marketing—concepts, scope, evolution, and digital marketing ecosystem. Traditional marketing versus digital marketing. Digital marketing channels. Consumer behaviour in the online fashion marketplace. Digital branding strategies. Customer journey mapping. Omnichannel marketing. Artificial Intelligence (AI) applications in digital marketing.

UNIT II – Fashion E-Commerce and Digital Retailing

Fashion e-commerce business models. Website planning and development. Product catalogue management. User experience (UX) and user interface (UI) design. Mobile commerce. Online payment systems. Digital retail management. Product Information Management (PIM). Inventory integration. Digital customer experience and personalization.

UNIT III – Social Media Marketing and Content Strategy

Social media platforms for fashion businesses—Instagram, Facebook, Pinterest, YouTube, LinkedIn, and emerging platforms. Content marketing and digital storytelling. Fashion photography and videography. Influencer and creator marketing. Community management. Social media campaign planning. AI-assisted content creation. Marketing automation tools.

UNIT IV – Search Marketing and Online Advertising

Search Engine Optimization (SEO). Search Engine Marketing (SEM). Google Ads. Pay-Per-Click (PPC) advertising. Display advertising. Email marketing. Affiliate marketing. Retargeting strategies. Digital advertising campaign planning. Keyword research. Conversion optimization. Performance marketing.

UNIT V – Digital Analytics and Fashion Brand Management

Web analytics using Google Analytics 4 (GA4). Key Performance Indicators (KPIs). Customer Relationship Management (CRM). Marketing dashboards. Online reputation management. AI-driven consumer insights. Fashion trend forecasting using digital tools. Sustainable and ethical digital marketing. Case studies of successful global fashion brands. Emerging trends in digital fashion marketing.

REFERENCES

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SEMESTER – III
ELECTIVE III
VISUAL MERCHANDISING

COURSE OBJECTIVES

- Analyze the principles, strategies, and consumer behaviour associated with visual merchandising in fashion retailing.
- Evaluate exterior, interior, and window display techniques for enhancing retail brand image and customer experience.
- Apply visual merchandising principles, retail space planning, and display technologies to create innovative retail environments.
- Assess the impact of digital technologies, sustainability, and experiential retailing on contemporary visual merchandising.
- Develop creative visual merchandising solutions for fashion retail stores using professional planning and presentation techniques.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Analyze the principles, objectives, and strategic role of visual merchandising in fashion retailing.	K4
CO2	Evaluate exterior visual merchandising techniques, storefront design, and consumer engagement strategies.	K5
CO3	Assess interior display planning, retail space utilization, and merchandising presentation techniques.	K5
CO4	Design innovative window displays and in-store visual merchandising solutions using appropriate retail display strategies and digital technologies.	K6
CO5	Critically evaluate fixtures, signage, props, mannequins, sustainability practices, and emerging trends in visual merchandising.	K5
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Fundamentals of Visual Merchandising

Introduction to visual merchandising—concepts, objectives, scope, history, and importance. Roles and responsibilities of visual merchandisers. Consumer behaviour and retail psychology. Store formats and retail environments. Exterior and interior merchandising concepts. Store layouts. Design elements and principles—line, colour, texture, balance, lighting, composition, and space planning. Virtual and digital visual merchandising.

UNIT II – Exterior Visual Merchandising

Storefront architecture and façade design. Store identity and branding. Exterior signage, marquees, banners, awnings, and wayfinding systems. Entrance design and accessibility. Lighting techniques. Seasonal and promotional displays. Outdoor visual communication. Digital signage, LED displays, interactive technologies, and consumer engagement strategies.

UNIT III – Interior Visual Merchandising

Interior retail presentation and space planning. Selling and non-selling areas. Display zones, focal points, planograms, merchandise presentation, colour coordination, category presentation, product grouping, customer circulation, retail atmospherics, lighting design, and sensory merchandising. Visual merchandising for luxury and lifestyle retailing.

UNIT IV – Window Display and Experiential Retailing

Window display planning and design. Types of window displays. Theme development, colour schemes, budgeting, installation techniques, and display calendars. In-store merchandising techniques including colour blocking, product blocking, vertical, horizontal, cross, and symmetrical merchandising. Digital displays, interactive retail technologies, augmented reality (AR), virtual reality (VR), and experiential retail environments.

UNIT V – Visual Merchandising Tools and Emerging Trends

Display fixtures, mannequins, props, signage, graphics, and display materials. Selection and evaluation of display systems. Sustainable visual merchandising materials and eco-friendly displays. Smart retail technologies, artificial intelligence (AI) in visual merchandising, retail analytics, omnichannel retail presentation, visual merchandising performance evaluation, and future trends in fashion retail.

REFERENCES

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SEMESTER – III

NMEC II

SELF GROOMING AND FASHION PHOTOGRAPHY PRACTICAL

COURSE OBJECTIVES

- Develop practical skills in personal grooming, professional presentation, and fashion styling.
- Apply photography techniques including camera handling, lighting, posing, composition, and image editing for fashion photography.
- Create and present a professional fashion photography portfolio integrating grooming, styling, and photographic presentation.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Perform personal grooming, fashion styling, and professional presentation techniques appropriate for different occasions.	P3
CO2	Apply photography techniques including camera handling, composition, lighting, posing, and fashion photography to produce professional-quality images.	P4
CO3	Create and present a professional fashion photography portfolio by integrating styling, photography, image editing, and presentation techniques.	P5
P1 – Imitation P2 – Manipulation P3 – Precision P4 – Articulation P5 – Naturalization		

PRACTICAL EXERCISES

Exercise I – Self Grooming and Fashion Styling

- Personal grooming practices (skin care, hair care, hygiene)
- Basic makeup demonstration
- Hairstyle practice
- Daily grooming routine
- Personality development and self-introduction
- Body language and communication skills
- Fashion terminology
- Elements and principles of fashion

- Outfit selection for various occasions
- Colour analysis and wardrobe styling

Exercise II – Fundamentals of Fashion Photography

- Camera handling and camera settings
- Composition techniques
- Fashion photography concepts
- Mood board preparation
- Indoor and outdoor lighting
- Portrait lighting techniques
- Model posing and direction
- Facial expressions and body angles
- Communication with models

Exercise III – Fashion Photography and Portfolio Development

- Outdoor fashion photography
- Studio fashion photography
- Photo editing and image enhancement
- Portfolio preparation
- Final fashion photography project
- Portfolio presentation and evaluation

REFERENCES

- Kelby, S. (2020). The Digital Photography Book (Vol. 1, 2nd ed.). Rocky Nook.
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- London College of Fashion. (2019). Fashion Styling and Photography. Laurence King Publishing.

SEMESTER – IV
CORE VIII
ADVANCED TEXTILE PROCESSING

COURSE OBJECTIVES

The students will be able

- Analyze advanced wet processing techniques for natural and synthetic textile fibres using sustainable processing technologies.
- Evaluate advanced natural dye extraction, dyeing technologies, and eco-friendly coloration methods for textile applications.
- Apply modern textile printing and functional finishing technologies for high-performance and value-added textile products.
- Assess advanced textile effluent treatment technologies and sustainable wastewater management practices in textile processing.
- Examine emerging innovations in textile processing, including nanotechnology, biotechnology, plasma technology, and advanced oxidation processes.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Analyze preparatory wet processing techniques and sustainable enzyme-based treatments for various textile fibres.	K4
CO2	Evaluate advanced natural dye extraction, eco-friendly dyeing methods, and emerging coloration technologies.	K5
CO3	Apply advanced textile printing technologies and sustainable printing processes for textile product development.	K3
CO4	Evaluate functional textile finishing technologies and appropriate application methods for performance enhancement.	K5
C05	Assess textile effluent characteristics and advanced wastewater treatment technologies for sustainable textile processing.	K5
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Advanced Preparatory Wet Processing

Wet processing sequence for cotton, wool, silk, polyester, and blended textiles. Advanced preparatory processes including desizing, scouring, bleaching, and bio-preparation. Enzyme-based pretreatments, low-liquor ratio processing, ozone treatment, plasma pretreatment, ultrasonic processing, and sustainable wet processing technologies.

UNIT II – Advanced Natural Dyeing and Dye Extraction

Advanced natural dyeing technologies. Exhaust dyeing, biomordanting, enzyme-assisted dyeing, supercritical carbon dioxide (SC-CO₂) dyeing, nanotechnology in natural dyeing, fermentation-assisted dyeing, ultrasonic dyeing, microwave-assisted dyeing, irradiation technologies, aerodynamic dyeing, and laser-assisted surface modification. Dye extraction techniques including aqueous, solvent, acid, alkali, enzymatic, ultrasound-assisted, microwave-assisted, and supercritical fluid extraction.

UNIT III – Advanced Textile Printing Technologies

Role of binders, thickeners, and auxiliaries in textile printing. Pigment printing, sublimation printing, natural dye printing, digital textile printing, inkjet printing, Direct-to-Film (DTF) printing, Direct-to-Garment (DTG) printing, screen printing, flexographic printing, plasma-assisted printing, enzyme-based printing, 3D printing, and sustainable printing technologies.

UNIT IV – Advanced Functional Textile Finishing

Nanotechnology in textile finishing. Microencapsulation. Plasma technology. Sol-gel finishing. UV-protective finishes. Antimicrobial finishes. Self-cleaning finishes. Water and oil repellent finishes. Flame-retardant finishes. Anti-odour finishes. Wrinkle-resistant, abrasion-resistant, moisture-management, and bio-functional finishes. Methods of application including exhaustion, padding, spraying, foam finishing, coating, transfer coating, and layer-by-layer deposition.

UNIT V – Advanced Textile Effluent Treatment

Characteristics and composition of textile effluents. Water consumption and water footprint in textile wet processing. Physical, chemical, biological, and membrane-based treatment technologies. Advanced oxidation processes (AOPs) including ozonation, photocatalysis, Fenton oxidation, electrochemical oxidation, UV/H₂O₂, and sonochemical treatment. Zero Liquid Discharge (ZLD), water recycling, resource recovery, sludge management, and sustainable wastewater management in textile industries.

REFERENCES

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SEMESTER – IV
CORE IX
AI IN APPAREL MANUFACTURING

COURSE OBJECTIVES

- Analyze Artificial Intelligence (AI), Machine Learning (ML), Deep Learning (DL), and Industry 4.0 technologies applied in apparel manufacturing.
- Evaluate AI-driven applications in apparel design, product development, production planning, quality assurance, and smart manufacturing.
- Apply intelligent digital technologies to improve productivity, quality, sustainability, and decision-making in apparel manufacturing.
- Assess AI-enabled automation, computer vision, robotics, and digital manufacturing systems for apparel production.
- Critically evaluate emerging AI technologies, ethical issues, and future developments in smart apparel manufacturing.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Analyze Artificial Intelligence, Machine Learning, Deep Learning, Industry 4.0, IoT, and cyber-physical systems used in apparel manufacturing.	K4
CO2	Evaluate AI-based applications in apparel design, CAD, pattern engineering, body scanning, 3D visualization, and mass customization.	K5
CO3	Assess AI-driven production planning, scheduling, process optimization, predictive maintenance, and lean manufacturing systems.	K5
CO4	Evaluate AI-enabled computer vision, intelligent quality control, robotics, and automated inspection systems in apparel manufacturing.	K5
CO5	Critically evaluate smart factories, digital twins, AI-enabled supply chains, sustainability, Generative AI, and future trends in apparel manufacturing.	K5
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Fundamentals of Artificial Intelligence in Apparel Manufacturing

Overview of apparel manufacturing systems. Fundamentals of Artificial Intelligence (AI), Machine Learning (ML), Deep Learning (DL), Computer Vision, and Data Science. Industry 4.0, Industry 5.0, Internet of Things (IoT), Cyber-Physical Systems (CPS), cloud computing, edge computing, and digital transformation in apparel manufacturing. Opportunities, challenges, and limitations of AI adoption.

UNIT II – AI in Apparel Design and Product Development

AI-assisted fashion forecasting. Intelligent CAD systems. Pattern engineering and automated grading. Body scanning and virtual fitting. 3D garment visualization. Digital sampling. Product Lifecycle Management (PLM). Mass customization. Personalized apparel production. Generative AI for apparel design. Large Language Models (LLMs) for design ideation. AI-assisted trend analysis and design recommendation systems.

UNIT III – AI for Production Planning and Process Optimization

AI in production planning and control. Demand forecasting. Production scheduling. Assembly line balancing. Marker planning and fabric utilization optimization. Predictive maintenance. Lean manufacturing. Intelligent workflow optimization. Digital manufacturing execution systems (MES). Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR) applications in apparel production.

UNIT IV – Intelligent Quality Control and Automation

Computer vision for apparel inspection. Image processing techniques. Automated defect detection and classification. AI-based measurement and fit assessment. Colour and shade evaluation. Robotics in sewing and material handling. Intelligent cutting systems. Collaborative robots (Cobots). Explainable AI (XAI) for quality decision support. AI-driven quality analytics and predictive quality management.

UNIT V – Smart Apparel Manufacturing and Emerging Technologies

Smart factories. Digital twins. RFID-enabled production monitoring. AI-enabled supply chain management. Digital Product Passport (DPP). Sustainability and resource optimization using AI. Blockchain for apparel traceability. Generative AI in manufacturing and product development. Ethical AI. Cybersecurity in smart manufacturing. Future trends in intelligent apparel manufacturing.

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SEMESTER – IV

SKILL ENHANCEMENT COURSE II

PROFESSIONAL COMPETENCY SKILL – PERSONALITY DEVELOPMENT

COURSE OBJECTIVES

The students will be able

- Analyze personality traits, leadership qualities, emotional intelligence, and self-management skills required for professional success.
- Evaluate the role of attitude, motivation, interpersonal relationships, and ethical behaviour in career and organizational effectiveness.
- Develop communication, leadership, teamwork, problem-solving, conflict management, and professional etiquette for workplace excellence.
- Apply critical thinking, decision-making, stress management, and time management techniques in professional environments.
- Enhance employability through professional networking, résumé development, interview preparation, digital professional branding, and career planning.

COURSE OUTCOMES

Course Outcomes	On completion of this course, students will be able to	Knowledge Level
CO1	Analyze personality theories, self-awareness, emotional intelligence, and SWOT analysis for professional development.	K4
CO2	Evaluate the influence of attitude, motivation, interpersonal relationships, and ethical behaviour on professional effectiveness.	K5
CO3	Apply leadership, communication, teamwork, conflict management, critical thinking, and decision-making skills in professional contexts.	K3
CO4	Assess professional competencies including body language, stress management, time management, workplace ethics, and organizational behaviour.	K5
CO5	Develop employability skills through résumé writing, LinkedIn profile development, group discussions, interview techniques, psychometric assessment, and professional presentations.	K6
K1–Remember, K2–Understand, K3–Apply, K4 –Analyze, K5– Evaluate, K6–Create		

UNIT I – Self-Awareness and Personality Development

Concept and dimensions of personality. Personality theories (Freud, Erikson, Big Five Personality Traits). Emotional Intelligence (EQ). Self-awareness and self-assessment. SWOT analysis. Success and failure factors. Goal setting, personal vision, and professional development planning.

UNIT II – Attitude, Motivation and Professional Behaviour

Attitude and its impact on professional success. Positive mindset and growth mindset. Motivation theories and self-motivation. Intrinsic and extrinsic motivation. Professional ethics, values, integrity, workplace behaviour, and emotional resilience.

UNIT III – Leadership and Interpersonal Effectiveness

Self-esteem and confidence building. Assertive communication. Interpersonal relationships. Leadership styles and qualities. Team building. Conflict resolution. Critical thinking. Creative and lateral thinking. Decision-making and problem-solving techniques.

UNIT IV – Professional Excellence and Workplace Skills

Business communication. Body language. Presentation skills. Time management. Stress management. Work-life balance. Organizational behaviour. Workplace etiquette. Cross-cultural communication. Networking skills. Digital professionalism and personal branding.

UNIT V – Career Development and Employability Skills

Career planning and lifelong learning. Résumé and curriculum vitae preparation. LinkedIn profile development. Portfolio preparation. Group discussions. Personal, technical, and behavioural interviews. Psychometric assessments. Mock interviews. Professional presentation skills. Freelancing, entrepreneurship, and workplace readiness.

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