



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Diploma Engineering

Level: Diploma

Branch: Fashion and Design

Subject Code: DI01069021

Subject Name: Basics of Textiles

w. e. f. Academic Year:	2026-27
Semester:	1 st
Category of the Course:	ESC-01

Prerequisite:	NA
Rationale:	The study of Basics of Textiles provides fundamental knowledge about textile fibres, yarns, fabrics, and textile processing. Fashion designers must understand the characteristics, performance, and applications of textile materials to make appropriate fabric selections for garments and fashion products.

Course Outcome:

After Completion of the Course, Student will able to:

No.	Course Outcomes	RBT Level
1	Identify different types of natural fibers (cotton, wool, silk, flax, etc.) and man-made fibers (rayon, polyester, nylon, acrylic, etc.).	U
2	Identify the different types of ginning machines and their working principles.	U
3	Analyze the effect of spinning parameters on yarn quality and performance.	A
4	Identify appropriate woven fabrics for different fashion and textile applications.	U
5	Identifying grey cloth defects.	A

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme:

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



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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Classification & Properties of Textile Fibers 1.1 Everything begins with the raw material, how fibers are classified and their unique traits. 1.2 Fiber Classification: Natural fibers (vegetable/cotton, animal/silk/wool, mineral) vs. Man-made/Synthetic fibers (regenerated cellulose, polyester, nylon, acrylic). 1.3 Properties: Essential properties like fiber length, strength, flexibility, spinnability, uniformity, density, luster, moisture regain, and elasticity. 1.4 Processing Basics: Specific harvesting and initial processing paths for silk, wool, and cotton.	04	13
2.	The Ginning Process 2.1 Separation of cotton fibers (lint) from the seeds, cleaning dirt and trash. 2.2 Machinery: Study of the mechanism, construction, and working principles of cotton ginning equipment (like Knife Roller Gins or Macarthy Gins). 2.3 Treatments: Importance of pre-ginning and post-ginning handling.	04	13
3.	The Spinning Process (Fiber to Yarn) 3.1 Blow Room Process: Opening & Cleaning. Opening compressed cotton bales, cleaning heavy trash, and converting loose fiber masses into a uniform sheet or feeding system. Includes equipment like Hopper Bale Openers and Scutchers. 3.2 Carding Machine: The Separating individual fibers, removing remaining microscopic impurities/neps, and forming a fragile web condensed into a rope-like strand. 3.3 Draw Frames: Blending & Levelling. Combining several slivers and drawing them out to improve fiber parallelism, uniformity, and blending. 3.4 Combing Machine: High Quality Sorting optional step for premium yarns to remove short fibers (noils) and ensure maximum parallelism of long fibers.	8	25



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	3.5 Speed Frame (Roving): First Twist Attenuating the sliver into a thinner strand called a roving and inserting a slight protective twist, wound onto a bobbin. 3.6 Ring Frame: Final Yarn Production. final thickness, imparting the final required twist for strength, and winding the finished yarn onto bobbins.		
4.	The Weaving Process (Yarn to Fabric) Preparatory steps before hitting the loom- Winding, Warping, Sizing, Looms & Motions- Construction of plain power looms. Understanding primary motions (shedding, picking, beating-up) and secondary motions (take-up, let-off). Introduction to shuttleless looms (Air jet, Water jet, Rapier).	7	24
5.	Fabric Structure & Basic Weaves Warp (vertical) and weft (horizontal) cross paths to create patterns. Basic Weaves: Representation of fundamental weaves on graph/point paper— Plain weave, Twill weave, and Satin/Sateen weaves. , Structural Parameters: draft plans, peg-plans, and identifying grey cloth defects.	7	25
	Total	30	100

Suggested Specification Table with Marks (Theory):

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

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

References/Suggested Learning Resources:

(a) Books:

1. **Fabric Science** – Arthur Price & Allen C. Cohen (Fairchild Publications). Best for fabric construction and identification.
2. **Textile Fibres** – V.A. Shenai. Excellent layout for chemical/physical profiles.
3. **Principles of Textile Testing** – J.E. Booth. The global standard for lab metrics and quality evaluation.
4. **Knitting Technology: A Comprehensive Handbook** – D.J. Spencer. Crucial for the warp and weft knitting modules.



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5. **Digital Learning:** SWAYAM / NPTEL online course pathways on "Introduction to Textile Engineering" or "Testing of Functional Textiles".

(b) Open-source software and website:

1. https://textilelearner.net/?utm_source=chatgpt.com
2. https://www.textileschool.com/?utm_source=chatgpt.com
3. https://nptel.ac.in/?utm_source=chatgpt.com
4. https://swayam.gov.in/?utm_source=chatgpt.com
5. https://www.nift.ac.in/?utm_source=chatgpt.com
6. https://www.fashionrevolution.org/education/?utm_source=chatgpt.com

Suggested Course Practical List:

Sr. No.	Practical outcomes	No. of Hours	% of Weightage
1.	Fibre Identification- Record observations like smell, ash, melting behavior, texture.	4	10
2.	Observe Fibres under microscope.	3	10
3.	Identify types of yarns.	4	10
4.	Understand different yarn count systems.	4	10
5.	Compare thick vs fine yarn samples.	2	10
6.	Develop basic repeat patterns.	4	10
7.	Explain each stage with sketches (Fiber → Yarn → Fabric relationship).	2	10
8.	Draw flow charts of: Ginning → Spinning → Weaving → Finishing.	4	10
9.	Identify and draw basic weaves.	4	10
10.	Collect fabric swatches (minimum 10–15 samples).	3	10
Total		34	100

List of Laboratory/Learning Resources Required:

1. Simple compound microscope
2. Different yarn samples (single, ply, textured, fancy yarns)
3. Spinning and yarn demonstration charts/models
4. Yarn count sample cards
5. Knitted fabric samples
6. Non-woven fabric samples
7. Weave structure charts (plain, twill, satin)
8. Graph paper / tracing sheets for weave diagrams
9. Computers or laptops - Internet access for textile learning websites



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Suggested Activities for Students:

1. Power point presentation
2. Internet based assignments
3. Teacher guided self-learning activities
4. Library/internet/lab based mini-project etc.

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