GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Diploma in Engineering

Level: Diploma

Branch: Textile Processing Technology

Course / Subject Code: DI01028011

Course / Subject Name: Elements of Textile and Garment Technology

w. e. f. Academic Year:	2024-25
Semester:	1st
Category of the Course:	PCC -01

Prerequisite:	**Basic knowledge of Mathematics and Textile fibers.**
Rationale:	The Textile processing holders have to understand various types of textile manufacturing processes which are the prerequisite of Textile processing department. Natural or manmade fibers are converted into yarn and yarn is converted into fabric. Fabrics are manufactured by weaving, knitting, knotting and non- woven techniques. This subject provides basic knowledge of textile manufacturing departments such as Spinning along with yarn numbering systems, Weaving along with the knowledge of textile woven design, Texturizing and Garment manufacturing.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Select relevant processes of yarn manufacturing for the given material.	R, A, E
02	Select relevant processes of yarn texturizing and fabric manufacturing.	R, A, E
03	Select relevant Processes of garment manufacturing.	R, A, E

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial / Practical		
L	T	PR	C	ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	**Yarn Manufacturing Process and Yarn Numbering System** 1.1 Explain basic terminologies of textile. 1.2 Sequence of yarn formation. 1.3 Objects of various spinning process. 1.4 Passage of material through various spinning department machines with neat line diagram: (i) Modern Blow room Line (ii) Card (iii) Draw frame (iv) Lap former (v) Comber (vi) Speed frame (vii) Ring frame. 1.5 Yarn numbering system and its conversion (i) Indirect numbering system: English, Metric (ii) Direct numbering system: Tex, Denier	18	43
2.	**Yarn Texturizing and Manufacturing Process** 2.1 Texturizing process-Objectives, yarn texturizing method classification, the passage of filament through false twist and air jet texturizing machine. 2.2 Sequence of fabric manufacturing. 2.3 Objects of various weaving process. 2.4 Passage of material through various weaving department machines with neat line diagram: (i) Winding machine (ii) Warping machine (iii) Multi-cylinder sizing machine (iv) Plain Power loom. 2.5 Basic weaves -Plain, Twill, Sateen, and Satin with design, draft andpeg plan. 2.6 Knitting process- Introduction, Warp and Weft knitting principle.	18	43
3.	**Introduction to Garment Technology** 3.1 Importance of garment industry to present textile trends. 3.2 Factor affecting selection of fabrics for final end product. 3.3 Stages of the garment manufacturing process. 3.4 Brief study of pattern design, grading system, spreading methods and types of cutter	9	14
	Total	**45**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
25	**30**	**25**	**10**	**5**	**5**

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

References/Suggested Learning Resources:

(a) Books:

1. Volume-1-Technology of Short Staple Spinning by Werner Klein; published by Rieter Machine Works Ltd. Winterthur, 2014 ISBN 10 3-9523173-1-4/ISBN 13 938- 3-9523173-1-0
2. Fibre to fabric by Bernard P. Corbman, McGraw-Hill Education – Europe, 1983 ISBN: 978-007-0662-360
3. Weaving Machine, mechanism and management by Dr M. K. Talukdar, Prof. P. K. Shriramulu, Prof. D. B. Ajgaonkar; published by Mahajan publishers Pvt. Ltd. Ahmedabad, 1998 ISBN 81-85401-16-0
4. Weaving-Conversion of yarn to fabric by P.R.Lord and M.H.Mohamed; published by Merrow Publishing Co. Ltd., England, 1982 ISBN: 0 900 54178 4
5. Technology of Clothing manufacture by Carr & Latham; published by Black well publisher England,2009 ISBN: 978-1-4051-6198-5
6. Textile Spinning, Weaving and Designing by M.G.Mahadevan; published by Abhishek Publications, Chandigarh ISBN:978-81-8247-107-8

(b) Open source software and website:

1. https://nptel.ac.in/courses/116/102/116102048/
2. https://www.rieter.com/
3. https://www.textileschool.com/
4. https://www.fibre2fashion.com/
5. https://textileguide.chemsec.org/
6. https://www.textileassociationindia.org/
7. https://www.nitma.com/
8. https://www.itamma.org/
9. https://www.slideshare.net/nisthachandela/garment-technology

Suggested Course Practical List:

1. Demonstrate the passage of material through Carding.
2. Demonstrate the passage of material through Draw frame.
3. Demonstrate the passage of material through Lap former.
4. Demonstrate the passage of material through Comber.
5. Demonstrate the passage of material through Speed frame.
6. Demonstrate the passage of material through Ring frame.
7. Calculate the fineness of given yarn using different count system.
8. Demonstrate the passage of material through false twist texturizing machine.
9. Demonstrate the passage of material through air jet texturizing machine.
10. Demonstrate the passage of material through Winding machine.
11. Demonstrate the passage of material through Warping machine.
12. Demonstrate the passage of material through Multi cylinder sizing machine.
13. Demonstrate the passage of material through Plain power loom.
14. Demonstrate stages of garment manufacturing process.

Suggested Project List: -

1. Carding: Prepare the report of carding machine with their specifications.
2. Draw frame: Prepare the report of draw frame machine with their specifications.
3. Speed frame: Prepare the report of speed frame machine with their specifications.
4. Ring frame: Prepare the report of ring frame machine with their specifications.
5. Winding: Prepare the report of winding machine with their specifications.
6. Warping: Prepare the report of warping machine with their specifications.
7. Sizing: Prepare the report of sizing machine with their specifications.
8. Plain power loom: Prepare the report of plain power loom machine with their specifications.

Suggested Activities for Students:

Students should perform following activities in group and prepare reports of about 5 pages for each activity. They should also collect/record physical evidences for their (student's) portfolio which may be useful for their placement interviews:

a. Visit nearby spinning and weaving industries and prepare a detailed report of the visit.
b. List out different manufacturers of spinning machines.
c. List out different manufacturers of weaving machines.
d. Collect specifications of different types of spinning and weaving machines.
e. Prepare survey report of different garments.

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