



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: Textile Technology

Subject Code : BE03029021

Course / Subject Name : Yarn Manufacturing Techniques - I

w. e. f. Academic Year:	2024 -25
Semester:	3
Category of the Course:	PCC

Prerequisite:	Basic knowledge of science subjects like physics, chemistry and mathematics.
Rationale:	Yarn manufacturing is the first important conversion process for staple fibres. Out of two spinning systems for making spun yarn: namely long staple and short staple, cotton being predominant fibre for India, the sequence of operations for short staple is very important.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Understand basics of ginning, blowroom and carding processes of spun yarns.	R,U
02	Select the type of ginning process for different varieties of fibres.	U,A,E
03	Select the number of cleaning points of blowroom for processing of different varieties of materials.	U,A,E
04	Implement the remedial measures for different quality related problems in lap formation and sliver formation processes.	U,A,E,C
05	Calculate the production and efficiency of blowroom machines & carding machine.	U,A,E

*Revised Bloom's Taxonomy (RBT)

Teaching and Examination Scheme:

Teaching - Learning Scheme (in Hours per Semester)					Total Credits = TH/30	Assessment Pattern and Marks					Total Marks
L	T	P	PBL*	TH		Theory		Tutorial / Practical			
						ESE (E)	PA (M)	PA/ (I)	PBL (I)	ESE (V)	
60	0	30	30	120	04	70	30	20	30	50	200

Where L = Lecture, T= Tutorial, P= Practical, TW/SL = Term-Work / Self-Learning, TH = Total Hours, ESE = End-Semester Examination, PA = Progressive Assessment

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Objectives of ginning, Working principle of double roller ginning machine. Introduction to spinning processes: Functions and passages of	20	28



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: Textile Technology

Subject Code : BE03029021

Course / Subject Name : Yarn Manufacturing Techniques - I

	spinning process: Blow room, Card, Draw frame, Lap former, Comber, Speed frame, Ring frame, Doubling & Reeling		
2.	<p>Blowroom: Basic operations in the blowroom, Feed material (raw material), The components of blowroom machines: Feeding apparatus, Various types of opening devices in blowroom (Endless path devices, Gripping elements, Rotating devices) The grid bar: Operating device, elements of the grid, Waste collecting chambers under the grid bar, Grid bar adjustment. factors influencing opening and cleaning of blowroom. Sequence of machines in a blowroom, Machines used for opening of fibers- automatic bale openers; Principles of cleaning at blowroom, Machines used for coarse cleaning and fine cleaning of fibers, cleaning efficiency. Principles of fibre mixing and blending, methods of mixing, Machines used for mixing of fibers, Lap formation in schucher, chute feeding. Dust removal, Damage prevention and fire protection, Technological developments in Blow room.</p>	20	36
3.	<p>Carding: Objectives of card, Types of cards, Operation involved in carding, Carding machine configuration: Card feed zone conventional and modern card, Carding zone, Delivery zone or Sliver formation, Packing formation. Sliver formation, design aspects of coilers, types of coiling, planetary coiling system; system; Maintenance of card, stripping and grinding, integrated gridding system; Important card settings and their influence on quality (no emphasis on values); Developments in carding.</p>	20	36
Total		60	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	20	15	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. Manual of Textile Technology, Volumes 1-3, W. Klein, The Textile Institute, Manchester, 1993.
2. Fundamentals of Spun Yarn Technology, Carl A Lawrence, CRC Press



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: Textile Technology

Subject Code : BE03029021

Course / Subject Name : Yarn Manufacturing Techniques - I

3. The Economics, Science and Technology of Yarn Production, P. R. Lord, School of Textiles, NC State University, USA, 1981.
4. Technology of carding, R. Chattopadhyay, NCUTE Publication, Ministry of Textiles, Govt. Of India, 2003.
5. NPTEL course on Yarn Manufacture I by R. Chattopadhyay, IIT Delhi.

(b) Open source software and website:

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

Suggested Course Practical List:

1. Lay out of Blow-room line and different Bypass arrangement.
2. Passage of material through Blow room.
3. Study of the construction and operation of automatic bale opening machine.
4. Study of the construction and operation of coarse cleaning machine.
5. Study of the construction and operation of mixing machine.
6. Study of the construction and operation of fine cleaning machine.
7. Study of the construction and operation of card feeding.
8. Maintenance of blow room machine, Production calculation.
9. Study the passage of material in a card.
10. Construction detail of feed zone, cylinder zone, licker zone, various web doffing device in a card.
11. Study the card delivery zone and coiling arrangement.
12. Draw a gearing plan, Zone wise draft calculation, draft constant calculation and its application and speed calculation.
13. Grinding and stripping operations
14. Maintenance of Card, Production calculation.

List of Laboratory/Learning Resources Required:

Ginning Machine, Blow Room, Card

• **List of suggested activities for Problem Based Learning:**

Sl. No.	Name of the activity	No. of hours	Evaluation Criteria
1.	Industry/Research laboratory visit	Visit = 5h, Report preparation = 5h Total = 10h	Based on report submitted. Report should contain observations and calculations based on industry/ lab data.
2.	Assignment writing. Numericals based assignment is preferable.	5 assignments of 2h each. Total = 10h	Based on the assignment submitted.
3.	Self learning on-line course	Minimum duration of the course should be 10h.	Examination based assessment at the end of course. Based on the certificate produced.



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Engineering

Level: UG

Branch: Textile Technology

Subject Code : BE03029021

Course / Subject Name : Yarn Manufacturing Techniques - I

4.	Poster/chart/power point preparation on technical topics	Duration = 6 h	Based on poster/chart preparation and presentation skills
5.	Technical Video based learning related to the subject	Duration of video = 5h Report preparation = 5h Total = 10h	Report /presentation based on the video learning outcomes.
6.	Working/non-working model on technical topics	Working = 12 h Non- working = 8 h	Based on inter department/external evaluation
7.	Industrial exposure for 2-3 days to observe and provide tentative solutions on society/environment/health/any other issue	Duration = 15 h for industrial exposure Problem identification and tentative solution = 10 h Total = 20 h	Based on evaluation of critical problems and solutions
8.	Group Discussion on emerging/trending technical topics based on subject	Duration = 1 h each	Based on performance in group discussion, technical depth, knowledge etc.
9.	Real world case studies-based learning	Duration of data collection/study = 5h Report preparation = 5h Total = 10h	Based on in-depth study, technical depth, data collected, fact finding, etc.

- All records pertaining to the evaluation and assessment of self-learning activities must be properly maintained and preserved at the institute level. These records should be made available to the university upon request.
- Institutes are encouraged to utilize digital platforms, such as Microsoft Teams, for effective record-keeping and to ensure transparency in the evaluation and assessment of self-learning activities.
