GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3132902
Semester III
Subject Name: Yarn Manufacture I

Type of course: Engineering Core

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.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	4	5	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	Brief idea about different ways of yarn formation, Classification of yarns, Sequence of Yarn formation for short staple spinning and its importance, Brief about Count system for yarn. General idea of Ginning & Baling Processes Objective of Ginning, principles of ginning process, study of different types of Ginning Machineries, Pre- and post- ginning operations, latest developments in Ginning and Baling Machines.	8
2	Blow Room: Objectives of Blow room, Objectives, principle and methods of Opening, Cleaning, mixing/ blending, Components of blow room machines, Construction and working principle of single process blow room, Construction and working of bale opening machines, Construction and working of coarse cleaning machines, Construction and working of mixing or blending machines, Construction and working of fine cleaning machines, material transport system, waste and dust collection systems, contamination sorters, waste recycling machines, Other Auxiliary machines required in modern blow room line, Technological developments, Processing of manmade fibre in Blow room, Calculations pertaining to Blow room.	18
3	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. Card Clothing, Grinding and Stripping, Card setting, Draft, Fiber configuration and neps in card sliver, blending, fibre breakage, hook formation, fibre transfer efficiency and factors affecting fibre transfer. Card settings, card Autoleveller, Tandem Card, Sliver Defects & Remedies, Technological developments, Processing of manmade fiber in card, Calculations related to Card.	16

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Suggested Specification table with Marks (Theory): (For BE only)

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	**30**	**20**	**20**	**5**	**5**

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

1. Technology of Short Staple Spinning, Vol. I, W. Klein
2. Blowroom & Carding, Vol. II, W. Klein
3. Spun Yarn Technology, volume I, Blow room processes - A. Ventasubramani.
4. Spun yarn technology, volume II, carding - A. Ventasubramani
5. Spinning of manmade and blends on cotton system- K. K. Salhotra
6. Handbook of Yarn Production, Technology, Science & Economics, Peter R. Lord
7. Fundamentals of Spun Yarn Technology,Carl A. Lawrence
8. Technology of Carding, R. Chattopadhyay, NCUTE, IIT Delhi.
9. Advances in Technology of Yarn Production,R. Chattopadhyay,
10. Maintenance management in spinning- SITRA

Course Outcomes: Afterlearning the course, students should be able to:

Sr. No.	**CO statement**	**Marks % weightage**
CO-1	Understand basics of ginning, blowroom and carding processes of spun yarns.	**35**
CO-2	Select the type of ginning process for different varieties of fibres.	**10**
CO-3	Select the number of cleaning points of blowroom for processing of different varieties of materials.	**20**
CO-4	Implement the remedial measures for different quality related problems in lap formation and sliver formation processes.	**20**
CO-5	Calculate the production and efficiency of blowroom machines & carding machine.	**15**

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List of Experiments:

1. Study of various types of staple spinning systems and related processes.
2. Lay out of Blow-room line and different Bypass arrangement.
3. Passage of material through Blow room.
4. Study of different parts of Blow-room
5. Study of driving arrangement of Blow-room.
6. Calculations:- (a.) Surface speeds (b.) Blows/inch (c.) Production.
7. Study of passage of material through Carding Machine.
8. Study of different parts of Carding Machine.
9. To study settings of different parts of Carding Machine.
10. Study of drive to different parts of the Carding Machine.
11. Calculations regarding to surface speeds of different parts of Carding Machine.
12 Calculations:- (a) Draft calculation (b.) TPI calculation.
13 Production of sliver on Carding Machine.
14 Report of the Mill visit.

Major Equipment: Ginning Machine, Blow Room, Card

List of Open Source Software/learning website:https://nptel.ac.in, World Wide Web, Google Search Engine etc.