

GUJARAT TECHNOLOGICAL UNIVERSITY

TEXTILE TECHNOLOGY (29)

YARN MANUFACTURING-I

SUBJECT CODE: 2132902

B.E. SEMESTER III

Type of course: Engineering

Prerequisite: Zeal to learn the subject

Rationale: Yarn Manufacturing I covers the basics of Fibres, Lap and Sliver formation processes which are considered to be the most important preparatory processes for yarn formation.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks			Practical Marks			
			ESE (E)	PA (M)		PA (V)		PA (I)		
				PA	ALA	ESE	OEP			
4	0	2	6	70	20	10	20	10	20	150

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1.	General idea of Ginning & Baling Processes Objective of Ginning, study of different types of Ginning Machineries, Characteristics of Bales and importance of contaminations, latest developments in Ginning and Baling Machines.	14	29 %
2.	Blow Room Objectives, Principles and Methods of Mixing and Blending; Different types of Conventional and Modern feeders, Openers & Cleaners; Blow Room sequence for different cotton & manmade fibers; Construction & working of machines for single process Blow room; Calculations pertaining to Blow room.	14	29 %
3.	Carding Objectives; Types of cards; Construction and Working of Revolving Flat Card; Card Clothing and its effect on sliver quality; Mounting; Grinding & Stripping with Integrated Grinding System; Card settings; Web Stripping and Coiler System; Auto leveller in Card; Semi and High Production Cards; Chute Feeding System; Tandem card; Latest developments in Card; Card waste and importance of suction hood for waste optimization at card; Calculations related to Card.	15	32 %
4.	Common defects and remedies in product delivered at each machine.	5	10 %

Reference Books:

1. A practical guide to opening and carding- W .klein.
2. Spun yarn technology, volume I, Blow room processes - A.Ventasubramani.
3. Spun yarn technology, volume II, carding - A.Ventasubramani
4. Peter R. Lord, Handbook of Yarn Production, Technology, Science and Economics, CRC Press publication, New York, 2002.
5. Carl A. Lawrence, Fundamentals of Spun Yarn Technology, CRC Press publication, New York.
6. R. Chattopadhyay Technology of Carding, NCUTE, IIT Delhi, 2003.

7. R. Chattopadhyay and R. S. Rengasamy, Spinning, Drawing, Combing & Roving, NCUTE Pilot, Programme, Indian Institute of Technology, New Delhi, 2003.
8. R. Chattopadhyay, Advances in Technology of Yarn Production, NCUTE, IIT Delhi, 2002.
9. W. Klein, Vol. 1 – 3, The Technology of Short Staple Spinning, A Practical Guide to Opening & Carding and A Practical Guide to Combing, Drawing and Roving frame, The Textile Institute Manchester, U.K., 1998.

Course Outcome:

After learning the course the students should be able to

1. Select the type of ginning process for different varieties of fibres.
2. Select the number of cleaning points of Blow room for processing of different varieties of materials.
3. Know the remedial measures to be taken for different quality related problems at different machines.
4. Calculate the production and efficiency of all the machines.

List of Practical:

1. Lay out of spinning Lab
2. Study of various methods of transferring motion from one shaft to another shaft.
3. Introduction to Ginning machines.
4. Introduction, objects of Blow room and lay out of Blowroom line.
5. Study of Bypass arrangement.
6. Passage of material through Blow room.
7. Study of construction details of all parts.
8. Study of driving arrangement.
9. Study of Piano Feed Mechanism.
10. Study of Full Lap Stop Motion and Doffing Arrangement.
11. Calculations:-
12. (a.) Surface speeds (b.) Blows/inch (c.) Production.
13. Exercise based on Blow room.
14. Study of passage of material through Carding Machine.
15. Study of different parts of Carding Machine.
16. To study settings of different parts of Carding Machine.
17. Study of drive to different parts of the Carding Machine.
18. Calculations regarding to surface speeds of different parts of Carding Machine.
19. Calculations:-
 - (a.) Draft calculation (b.) TPI calculation.
20. Production of sliver on Carding Machine.
21. Exercise based on card.

Open Ended Problems/Design Oriented Problems: Apart from above experiments a group of students has to undertake one open ended problem/design problem. Few examples of the same are given below.

1. Develop a Knife Roller Gin.
2. Develop a 2 Bladed Beater of Blow Room.
3. Develop a Licker-in of Card.

Major Equipments:

Blow Room

Carding Machine

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

ACTIVE LEARNING ASSIGNMENTS: Preparation of power-point slides, which include videos, animations, pictures, graphics for better understanding theory and practical work – The faculty will allocate chapters/ parts of chapters to groups of students so that the entire syllabus to be covered. The power-point slides should be put up on the web-site of the College/ Institute, along with the names of the students of the group, the name of the faculty, Department and College on the first slide. The best three works should submit to GTU.