SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Engineering

B E II Textile Technology: Semester – IV

Subject Name: Yarn Manufacturing - II **Subject Code: BTTT13401**

Type of course: PCC

Prerequisite (if any): Basic knowledge of fibres, ginning, blow room and carding process

List of Courses where this course will be prerequisite:

Rationale: Short staple spinning is highly applicable for majority of the situation. The attenuation, parallelization and reduction in diameter of material are important preparatory process to produce different count range from different variety of cotton fibre. There are two types of cotton spinning processes namely carded and combed within short staple spinning. Both have particular end use and application domain.

Thus Yarn Manufacturing II covers the basics of Sliver, Lap formation and Roving formation processes which are considered to be the most important preparatory processes for yarn formation.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	2	4	60	25	15	30	20	150

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests CA2: Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

BSC: basic science course /ESC: Engineering Science Course /HSM: Humanities and management /PCC: Professional Core course /PEC: professional Elective course /OEC: Open Elective course/ MD: mandatory non-credit course

Content:

Sr. No.	Content	Total Hrs
1	**Draw Frame:** Objects of drawing. Constructional details of draw frame. Principles of roller drafting and doubling; drafting waves and control of fibres; roller slip and roller eccentricity Perfect Drafting, Irregularity due to drafting and remedies. Processing of man-made fibres and blends on Draw Frame. Performance Assessment of draw frame Auto-leveller in draw frame; Online quality monitoring and control;; Latest developments; Calculations – draft, production etc.	15
2	**Comber:** Preparation for combing / Comber lap preparation; Introduction and objects of combing process; History of comber development; Objects of combing process. Study of combing cycle. Constructional details of Comber- feeding, nipper assembly, cylinder and detaching rollers, cylinder needles, web and sliver transport, drafting and coiling at comber. Semi combing, normal combing, super combing and double combing. Forward and backward feed in combing. comber Index Cycle, Comber Settings. The noil theory of Gegauff; control of Comber waste.Assessment of Comber Performance – Automation in Comber: Automatic and centralized noil collection. Automatic material handling, Stop motions in comber. modern combers,Common defects and their causes during the Combing process; Calculations - comber noil%, comber production etc.	15
3	**Speed Frame:** Objectives; Concept of drafting, twisting and winding process; working principles of speed frame: Creel, drafting system – top and bottom rollers – top arm drafting system – roller settings – roller weighting systems; flyer& flayer assembly; drive to different parts of machine; spindle lead and bobbin lead; Study of mechanisms like – differential motion, swing motion, building mechanism, semi-automatic and automatic doffing, etc; Assessment of performance of speed frames. Processing of man-made fibres and blends on speed frame. Modern flyer, Latest developments.	15

	Calculations – draft, twist, production.	

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	**20**	**10**	**10**	**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:

Sr no	**Title of book /article**	**Author(s)**	**Publisher and details like ISBN**	**Year of publication**	**Publication Edition**
1	Handbook of Yarn Production, Technology, Science and Economics	P. R. Load	CRC Press publication, New York,	2002.	
2	Fundamentals of Spun Yarn Technology	Carl A. Lawrence	CRC Press publication, New York 1-56676-821-7	2002.	
3	Spinning, Drawing, Combing & Roving	R. Chattopadhyay and R. S. Rengasamy	NCUTE Pilot, Programme, Indian Institute of Technology, New Delhi,	2003.	

4	Advances in Technology of Yarn Production	R. Chattopadhyay	NCUTE, IIT DELHI	2002	
5	The Technology of Short Staple Spinning, A Practical Guide to Combing, Drawing and Roving frame; Vol 1 - 3	W. Klein	The Textile Institute Manchester, U.K.,	1998	
6	Essential calculations of practical cotton spinning	T. K. Pattabhiraman	Textile Trade Press;	1985	2nd
7	Spinning of Man Made and Blends on Cotton System	Salhotra K R	The Textile Association of India, Mumbai	1989	
8	Spun Yarn Technology	Eric Oxtoby.	Butterworth Architecture, London	1987	
9	Cotton Drawing and Roving	Merrill Gilbert	Gillbert Merrill lowell	1956	
10	Spurn Yarn Technology: Vol.- III, Draw Frame Fly Frame Combing Processes	Venkatasubramani, A	Saravana Publications, Madurai :	2001	

After learning the course the students should be able to:

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Understand basics of Drawing, Combing and Roving formation processes of staple spun yarns.	25
CO-2	Understand the working principles and process parameters of combing preparatory, comber , Draw frame and speed frame	35
CO-3	Apply knowledge of cotton spinning process for a given variety cotton fibre to manufacture different count range.	15
CO-4	Implement the remedial measures for different quality related problems in sliver formation and roving formation processes.	15
CO-5	Calculate the amount of draft, production and efficiency of Draw frame, comber and speed frame machine.	10

Mapping with POs:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO-1	**3**	**3**	**1**	**2**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**1**	**3**	**3**	**2**
CO-2	**3**	**3**	**1**	**2**	**2**	**1**	**1**	**1**	**2**	**3**	**2**	**1**	**3**	**3**	**3**
CO-3	**3**	**3**	**1**	**2**	**2**	**1**	**1**	**1**	**2**	**3**	**2**	**1**	**3**	**3**	**3**

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CO-4	**3**	**3**	**1**	**2**	**2**	**1**	**1**	**1**	**2**	**3**	**2**	**1**	**3**	**3**	**3**
CO-5	**3**	**3**	**0**	**1**	**2**	**0**	**0**	**1**	**1**	**2**	**1**	**1**	**2**	**3**	**1**
Rationale*	**3**	**3**	**1**	**2**	**2**	**1**	**1**	**1**	**2**	**3**	**2**	**1**	**3**	**3**	**3**

Rationale* : AS Yarn Manufacturing II covers the basics of Sliver, Lap formation and Roving formation processes which are considered to be the most important preparatory processes for yarn formation, it relates fairly good with Pos and strongly with PSO.

List of Open learning website: https://nptel.ac.in

List of Open Source Software: World Wide Web, Google Search Engine

FOR LAB SESSIONS:

List of Experiments:

1. To study passage of material through draw frame.
2. To study drive to different parts of draw frame.
3. To calculate RPM and surface speed of different parts of draw frame.
4. To calculate Production and TPI of sliver.
5. To study basics, working principles and process parameters of combing preparatory.
6. To study the passage of material through Comber.
7. To study drive to different parts of comber.
8. To study combing cycle & different gauges used for setting on comber
9. To calculate RPM and surface speed of different parts of comber.
10. To calculate production of comber.
11. To study the passage of material through speed frame.
12. To study flyer, flyer assembly system on speed frame.
13. To study drafting system on speed frame.
14. To study drive to different parts of speed frame.
15. To study the movement of bobbin rail on speed frame.

16. To study differential motion on speed frame.
17. To study Builder motion on speed frame.
18. To calculate draft, TPI of speed frame.
19. To calculate production of speed frame

Major Equipment Needed: Draw frame, Lap former, Comber, Speed frame