SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and Technology
Bachelor of Engineering

B E II Textile Technology: Semester – III

Subject Name: YARN PREPARATION **Subject Code: BTTT13301**

Type of course: ~~BSC/ESC/HSM~~/PCC/~~PEC/OEC/MD~~ Professional Core Course

Prerequisite (if any): Basic knowledge of science subjects like Physics, Chemistry & Mathematics.

List of Courses where this course will be prerequisite: Fabric Formation-I, Fabric Formation-II, Process & Quality Control in Textile.

Rationale: (should also include Description of the relevance of this course in the Program) Yarn preparation has always been key to the efficient running of the subsequent processes. This fact becomes even more obvious with the ever-increasing production rates in weaving and knitting.

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	Brief idea about different ways of fabric formation. Classification of fabrics. Sequence of Yarn Preparation Process for weaving Warp preparation: Winding: Objects of winding; Different bobbins (a) before winding; (b) after winding; Winding machines classification; Types of winders, Basic components of a winder; Different types of winding: parallel, random, precision, stepped precision; Package building, Winding parameters & their optimization; Yarn tension & tensioning devices; Yarn clearing, yarn faults, yarn clearing devices: Mechanical yarn clearers or Slub catchers- Fixed blade, Swinging blade type, Electronic yarn clearer- photo-electric detection, Capacitance detection, Concept of clearing curves and setting of electronic clearers, methods of yarn traversing & package drive; Yarn joining by knotting & Splicing; Package faults, remedies & Calculations related to production, efficiency etc.; Automatic winding machines : Large group winder; Small group winder, basic components, Doffer, Cleaning & dust removal system, Intelligent lot change.	**16**
2	Warping: Objects; Systems of warping; Constructional details & features of warping machine; drive to machine parts; types of creel, control devices, Direct & Sectional warping, defects and remedial measures; Calculations related to production, efficiency etc.; concept of ball warping, draw warping, features of modern machines.	**9**
3	Sizing: Introduction; Objects; Sizing Ingredients; Classification of sizing machines; features of sizing machine; size preparation and application, Methods of drying sized yarns, Sizing of synthetic yarns, staple fibre yarns, polyester-cotton blends etc.; Defects and remedies; Calculations related to Size concentration, size	**14**

	pick up, stretch, drying, count of warp, production, efficiency, etc. Multi cylinder sizing for Spun yarn, beam to beam and single end sizing of filament, sizing for denim.	
4	Warp Preparation after sizing: Threading & Looming; Drawing-in, Warp tying equipment	**2**
5	Weft Preparation: Methods of Weft Preparation; Object of Pirn Winding, Types of Pirn winding machines; Build of pirn; Drive, Traversing, advancing, Automatic pirn winder; Calculations related to production, efficiency etc.	**4**

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	**20**	**05**	**05**	**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 Weaving	Sabit Adanur	CRC Press, 9781587160134	2000	I
2	Modern Preparation & Weaving Machinery	A. Ormerod	Elsevier Science & Technology Books 10: 0408012129	1983	
3	Weaving: Conversion of yarn to fabric	Lord and Mohammed	Merrow Publishing Co Ltd 9780900541780	1973	2ND
4	Yarn Preparation Vol I & II	R. Sengupta			
5	An Introduction to Winding and Warping	M. K. Talukdar			
6	Technology of Fabric Manufacture-I	R. Muthusamy and S. Kathirvelu			

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7	Fundamentals of Yarn Winding	Milind Koranne	Woodhead Publishing India Pvt. Ltd.,9789380308388	2013	
8	Sizing: Material Methods and Machineries	D. B. Ajgaonkar, M. K Talukdar and Wedekar			
9	The Technology of Warp Sizing	J. B. Smith			
10	Textile Sizing	B. C. Goswami, Rajesh Anandjiwala & David M. Hall			
11	Sizing	Sydel			

Course Outcomes:

Sr. No.	**CO statement**	**Marks % weightage**

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CO-1	Understand the objectives, process & basics functions of winding, warping and sizing process.	40
CO-2	Apply technology of winding, warping and sizing machine to develop suitable packages.	20
CO-3	Analyse the fundamental difference in various winding systems, direct and indirect warping process and different sizing systems.	10
CO-4	Identify and analyze package faults & their causes of winding, warping and sizing process.	15
C0-5	Calculate the production and efficiency of winding, warping and sizing processes.	15

Mapping with POs:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO-1	**3**	**2**	**2**	**1**	**2**	**0**	**2**	**3**	**2**	**2**	**2**	**2**	**3**	**3**	**2**
CO-2	**3**	**2**	**2**	**3**	**3**	**0**		**2**	**2**	**2**	**2**	**2**	**3**	**3**	**2**
CO-3	**2**	**2**	**2**	**3**	**3**	**0**	**1**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**2**
CO-4	**2**	**2**	**2**	**3**	**3**	**0**	**1**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**2**
CO-5	**3**	**2**	**2**	**3**	**3**	**0**	**1**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**2**
Rationale*	**3**	**2**	**2**	**3**	**3**	**0**	**1**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**2**

Rationale*: Explaining why it is matching this particular program outcome

The knowledge of yarn preparatory process is must to produce any textile product of better quality,

hence the course outcome matches significantly with the program outcome.

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

FOR LAB SESSIONS:

List of Experiments:

1. Prepare chart of fabric formation and related processes.
2. Study of different types of tensioners.
3. Study of different types of yarn clearers
4. Package build on drum & precision driven winding machines
5. Study of different types of Traverse motions.
6. Study of Thread stop motion, drive and calculation of winding machine.
7. Study the features of latest winding machine.
8. Study passage of material and important parts of pirn winder.
9. Study traverse and drive mechanism on pirn winding machine.
10. Study yarn path through Direct and Sectional warping machine.
11. Study the features of latest direct and sectional warping machines.
12. Study of other types of warping machines.
13. Study passage of material and important parts of sizing machine.
14. Study creel, head stock and calculation of sizing machine.
15. To study the features of latest Sizing machine.
16. Report of the Mill visit.

Major Equipment Needed: Winding Machine, Pirn Winding, Warping Machine, Sizing Machine