



SARVAJANIK UNIVERSITY
Sarvajnik College of Engineering and
Technology
Bachelor of Engineering



B E IIIrd Year Textile Technology: Semester – V

Subject Name: Knitting Technology

Subject Code: BTTT14502

Type of course: Professional Elective Course 1

Prerequisite (if any): Basic knowledge of Textile and fabric formation methods

List of Courses where this course will be prerequisite: Production of various types of fabrics and their applications in apparels and garments as well as Technical Textiles.

Rationale: This subject covers basics of Knitting technology; which includes Circular weft knitting, Warp knitting and Flat bed 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

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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



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Content:

Sr. No.	Content	Total Hrs
1	Introduction to knitting, Unique features and applications of knitted fabrics, Comparison of knitting with weaving with respect to production and properties, Basic knitting terminologies, Classification of warp and weft knitting, Representation of a knit structure, laddering in a knit structure.	4
2	Construction and working of Knitting elements on Circular weft knitting machine - Needle bed, Cylinder, Sinker, Cam, Study different types of needles used in knitting and their comparison Knitting actions and loop formation in different needles.	4
3	Circular weft knitting: Introduction to Weft Knitting process, Passage of yarn through different parts of circular weft knitting machine, Study of elements of knitting machines such as: yarn supply, creel, yarn feeding, loop formation, take down motion, stop motions etc.	4
4	Production of basic weft knit structures- Plain, Rib, Interlock and Purl, structure, Properties and its representation. Derivatives of basic weft knit structures	4
5	Different types of principal stitches used in Circular Knitting - Float stitch, Tuck stitch, knit, miss, held loop, drop or press-off stitch, their representation and their influence on fabric properties. Various structural modifications commonly used in weft knitting like laying in, plating, open work, Intarsia.	4
6	Defects and remedies in weft knitting, Requirement of yarn quality, Production calculation of Circular knitting machine	2
7	Features of Modern Circular knitting machine, recent developments like relative technology (Relanit) for circular knitting machines, knitting of fleecy and plush fabrics, striper and loop transfer mechanism.	2
8	Flat knitting: Construction and working of flat bed and v bed knitting machines. Basic elements and their functions, different types of machines and their operations	2

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	For various stitches like miss, tuck, transfer and drop stitch. Socks and gloves knitting machines.	
9	Warp knitting: Introduction to warp knitting, warp knit structure and its applications, Warp preparatory process for warp knitting, Basic loop formation in a warp knitting, comparison of weft and warp knitting.	4
10	Warp knitting machines (Raschel and Tricot): Passage of yarn through different parts of warp knitting machine, Basic elements of warp Knitting machine (needle, sinker and guide bar, Take up motion), swinging and shogging motion of Guide bar, sequence of loop formation in raschel and tricot warp knitting machine. Warp knit fabric representation, lapping plan and diagram. Comparison of Raschel and Tricot warp knitting machine.	6
11	Studies of different warp knit structures: Structures and properties of single guide bar construction (pillar stitch, 1 x 1, 2 x 1 And other tricot lap open/ close loop, atlas construction), Structures and properties of Two guide bar construction (two bar tricot, locknit, reverse lockint, satin, raised Loop, sharkskin, queenscord), Net structures, Double needle bed warp knit- pile fabric.	5
12	Defects and their remedies measures in warp knitted fabrics, yarn quality requirements for warp knitting. GSM and production calculations.	2
13	Features of modern warp knitting machines, Recent developments like whole Garment production.	2

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	15	10	5	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.

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Reference Books:

Sr no	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Knitting Technology- A comprehensive handbook and Practical guide	David J Spencer	Woodhead Publishing Limited ISBN 1-85573-333- 1	2001	3 rd edition
2	Knitting Technology	Prof. D.B.Ajgaonkar	Universal Publishing Corporation, Mumbai ISBN – 81-85027-34-X	2006	
3	Fundamentals and Advances in Knitting Technology	Sadhan Chandra Ray	Woodhead Publishing India ISBN: 978-93-80308-16-6	2015	
4.	Advances in Knitting Technology	K. F.Au	Woodhead Publishing ISBN - 978-0081017173	2016	
5.	Introduction to Knitting Technology	Henry Johnson,	Abhishek Pubs, Chandigarh ISBN -81-8247-114-1	2006.2008	



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6	Knitting Fundamentals Machines Structures and Developments	Anbumani. N	New Age International Pubg.Ltd , New Delhi ISBN - 978-81-224-1954-2	2006	
9	Circular Knitting	Chandrasekhar Iyer, Bernd Mammel And Wolfgang Schach	Meisenbach Bamberg / Mahajan Publisher , Ahmedabad ISBN 13: 9783875250527	1992	
10	Warp Knitting Production	Raz, Shmuel	Melliand Textilberichte, ISBN - 9783875290226	1987	

Course Outcomes:

Sr. No.	CO statement	Marks weightage	%
CO-1	Describe basic warp and weft knitting process, construction and working of various elements used in circular weft knitting and warp knitting machine along with their function.	30	
CO-2	Describe various warp and weft knitted fabrics, its structure, properties and applications along with structural modifications.	30	
CO-3	Study defects and remedies in weft and warp knitting, yarn quality requirements	10	
CO-4	Describe flat bed knitting, socks knitting, glove knitting process and its elements	20	
CO-5	Study modern developments and production calculation of warp and weft knitting machine	10	

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Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO-1	2	1	1	1	2	1	0	0	0	1	2	1	3	2	2
CO-2	3	2	2	1	2	1	0	0	0	1	3	1	3	2	2
CO-3	3	3	2	2	2	1	1	0	1	2	3	2	3	3	2
CO-4	2	2	1	1	2	1	0	0	0	1	2	1	3	2	2
C0-5	2	1	2	2	3	1	1	1	0	2	2	1	3	2	3
Rationale*	2	2	1	1	2	1	0	0	0	2	3	1	3	2	2

Rationale*: Knitting is an important fabric forming method having diverse application in apparel sector as well as developing field of Technical Textiles. The study of the subject leads to achievement of various PO.

List of Open learning website: Websites of knitting machine manufacturers

List of Open Source Software: <https://nptel.ac.in>, Google search Engine or any other search engine.

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FOR LAB SESSIONS:

List of Experiments:

1. To study the passage of the yarn through circular weft knitting machine.
2. To study the construction and working of the different parts and knitting elements for circular Weft knitting machine.
3. To study the driving arrangement of circular weft knitting machine and calculate rpm of important parts.
4. To study the cloth take up mechanism of circular weft knitting machine.
5. To study the arrangements of cylinder and dial needles, cam system and driving mechanism for the production of rib structure and Interlock structure
6. Fabric analysis of the Plain, Rib, Purl and Interlock structure (course per inch, wales per inch, loop length etc.).
7. To study Stitch cam settings and its effect on loop length and fabric properties.
8. Production calculation of Circular weft knitting machine.
9. To study the yarn passage through the warp knitting machine.
10. To study the working of the different knitting elements used in Raschel and Tricot warp Knitting machine.
11. To study drive to various parts of Warp knitting machine and calculate rpm of important parts.
12. To study and analyze various warp knit structures.
13. Production calculation of Warp knitting machine.
14. To study passage of material on material on Flat bed knitting machine and study its elements.
15. Preparation of different types of knitted Fabric.

Major Equipment Needed:

- 1) Circular Weft Knitting Machine
- 2) Raschel and Tricot Warp Knitting Machine
- 3) Flat bed knitting machine