GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3172920

Semester: VII
Subject Name: Science and Technology of wool

Type of course : Open Elective

Prerequisite : Students should have basic knowledge of textile fibres, mainly wool.

Rationale : Wool is known as a golden fiber amongst the various textile fibers. Products made from this fiber are versatile for almost all weather conditions and that is why wool is also known as all season fiber. Products made from this fiber are not only popular in apparel industry but also well known in technical textiles.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	30	0	0	100

L- Lectures; T- Tutorial/Teacher Guided Student Activity; P- Practical; C- Credit; ESE- End Semester Examination; PA- Progressive Assessment

Content:

Sr. No.	Content	Total Hrs
1	**Wool fibre properties:** Sheep breeds and shearing, grading of wool; morphological and chemical structure of wool fibres; physical properties of wool such as length, micron, strength, crimp, total fatty matter (tfm) etc.	6
2	**Chemical processing of wool fibre/top:** Impurities in raw wool and their removal, different methods of scouring, carbonisation of wool and back washing, top dyeing of wool.	6
3	**Yarn manufacturing system:** Classification and brief outline of spinning systems used for wool fibers i.e. woollen, semi-worsted and worsted. Woollen spinning system: basic concepts of wool spinning, woollen carding- mechanism and card settings, uses of woollen yarns.	8
4	**Worsted/semi worsted spinning system:** Concept of worsted & semi worsted card, gilling, combing, top preparation, blending, rubbing frame and ring spinning. norms for worsted and woollen yarn quality.	8
5	**Woollen/Worsted weaving:** Weaving preparatory for woollen and worsted, selection of weaving machines for woollen and worsted blended fabrics. Manufacturing of suiting, carpet and blanket fabrics.	6
6	**Finishing of Wool fabrics:** Scouring, crabbing, milling, bleaching, dyeing, shearing/singeing, decatising, pressing etc.	8

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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	15	5	0	0

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. The Microscopy of Animal Textile Fibres by A.B. Wildman, Wool Industries Research Association, 1954.
2. Theory and Practice of Wool Dyeing by C.L. Bird, Society of Dyers and Colourists, 1951.
3. Production of Quality Woollen Yarn by WIRA.
4. Practical Worsted Carding by T.F. Griffin, National Trade Pres, 1957.
5. Wool Spinning, Vol. I & II by Y. Lipenkov, Mir Publishers, 1983.
6. Spun Yarn Technology by Eric Oxtoby. Elesevier Publication, 1987.

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Understand the wool fiber and its properties.	14
CO-2	Explain production of woollen yarn and its blends.	38
CO-3	Understand the fabric preparation technology.	15
CO-4	Understand the science of wool and its blend chemical processing.	33

List of Open Source Software/learning website: Any search engine, NPTEL, SWAYAM portal etc.