

GUJARAT TECHNOLOGICAL UNIVERSITY

TEXTILE ENGINEERING (25) TEXTURED YARN TECHNOLOGY SUBJECT CODE: 2712509 SEMESTER: I

Type of course: Elective

Prerequisite: Basic knowledge of texturizing process at BE level

Rationale: Texturing is an important process for man-made filaments. As the use of man-made fibres is ever increasing all over the world, the knowledge of texturizing is imperative to understanding the use during later processes

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)			
					ESE	OEP	PA	RP		
3	2	2	5	70	30	20	10	20	0	150

Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	Principles of texturing and modern classification, optimization of texturing parameters, Draw-texturing- the need and fundamental approaches; Mechanics of texturing. Physical and mechanical properties of textured filament yarn structure and geometry of textured yarns – Role of spin finish on textured yarns.	9	25
2	Basics of false-twist texturing – texturability of various fibres – process parameters – Draw texturing – simultaneous and sequential draw texturing.	10	25
3	Air jet texturing - Principle, mechanisms, development of jets and machinery, process optimization and characterization, air jet texturing of spun yarns. Air interlacement - Principle and mechanism, jet development and Characterization, Bulked continuous filament yarns - Need, principle, technology development.	9	25
4	Friction texturing- the need and development, mechanics of friction texturing, latest development in twisting devices,	6	15
5	Bulked continuous filament yarns - Need, principle, technology development. Hi-bulk yarns	6	10

Reference Books:

1. D. K. Wilson and T. Kollu, The Production of Textured Yarns by the False Twist Technique, Textile Progress, Vol. 21, No.3, Textile Institute, Manchester, U.K., 1991.
2. J.W.S. Hearle, L. Hollick and D.K. Wilson, Yarn Texturing Technology, Woodhead Publishing, UK, 1998.

3. C. Atkinson, False twist Textured Yarn. Woodhead Publishing

TRJ, JTI and other technical journal Papers

Course Outcome:

After learning the course the students should be able to:

1. The postgraduates will become familiar with fundamentals of texturing technology subjects and thus acquire the capability to applying them.
2. The postgraduates will be able to apply the basic concepts to design and translate the design into prototype / product and also to analyze and interpret data related to textile design, manufacturing and quality analysis.
3. Understand the testing and applications of textured yarns and fabrics made from them.
4. Understand the physics and mechanics of texturing techniques depending on yarn applications.
5. Understand importance process parameters in texturing process

List of Experiments:

1. Analyze the raw material requirements for texturing process.
2. Evaluate the applicability of draw texturing and edge crimping.
3. Evaluate Tg and Tm values for different fibres?
4. Analyze the different process variables involved in drawing and their influences on properties of fibres.
5. Analyze the structural changes that take place in a fibre during drawing process in draw texturing process.
6. To understand importance heater length and temperature in draw texturing process.
7. To study physics of nozzle design in air jet texturing process.
8. Study different testing methods to measure the characteristics of texturing yarn.
9. To analyze design modifications in texturing machines

Open Ended Problems:

1. Analyze various ways to optimize texturing process parameters for economic production.
2. What are the latest developments bulked continuous filament yarns?
3. Explore physical and mechanical properties of textured filament yarn.
4. Explore recent developments in high performance air jet nozzle in air jet texturing.

Major Equipments: Draw texturing machine, Air jet texturing machine, Friction texturing machine, Dynafil M tester

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