



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Master

Branch: Textile Engineering

Course / Subject Code : ME01025041

Course / Subject Name : Textured Yarn Technology

w. e. f. Academic Year:	2024-25
Semester:	1 st Semester
Category of the Course:	PEC

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 fibers is ever increasing all over the world, the knowledge of texturizing is imperative to understanding the use during later processes.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Understanding different types of textured yarn, its properties, and applications. Also be able to identify and understand structure of textured yarn and mechanics of texturing.
02	Learning the principle of different texturing methods such as false twist texturing, Air jet texturizing, Friction texturizing. They will also be able to identify process parameters of different texturizing method.
03	Knowledge about the textured yarn testing. Able to identify application of textured yarn and fabrics made from them.
04	Understanding the significance of important process parameters in texturizing process.
05	Knowledge to describe and figure out the parts and passage of BCF draw texturing machine. Also be able to understand properties of BCF yarn.

**Revised Bloom's Taxonomy (RBT)*



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Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR		C	Theory		Tutorial / Practical	
			ESE (E)		PA / CA (M)	PA/CA (I)	ESE (V)	
3	0	2	4	70	30	20	30	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Principles of texturing and modern classification of Textured yarn, Methods of manufacturing Textured Yarns, Comparison of different texturizing methods 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	19%
2.	False-twist texturing – Basic principle, Mechanism, Process parameters, texturability of various fibres – process parameters – Draw texturing – simultaneous and sequential draw texturing.	10	24%
3.	Air jet texturing - Principle, mechanisms, Air jet texturizing machine, development of jets and machinery, process optimization and characterization, air jet textured yarns application. Air interlacement - Principle and mechanism, jet development and Characterization, air jet texturing of spun yarns.	9	19%
4.	Friction texturing- the need and development, mechanics of friction texturing, latest development in twisting devices.	8	19%
5.	Bulked continuous filament yarns – BCF draw texturing machine, Process variables, BCF yarns, Modification of yarn properties during draw texturing.	9	19%
Total		45	100



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Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	20	20	20	10

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) 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
4. Textile Research Journal, Journal of Textile Institute and other technical journal Papers

(b) Open source software and website:

1. <http://nptel.ac.in>
2. World Wide Web, Google Search Engine etc.
3. Rahul Dubey, "An Introduction to Internet of Things: Connecting Devices, Edge Gateway, and Cloud with Applications", Cengage India Publication
4. Raj Kamal, "Internet of Things: Architecture and Design Principles, Mc Graw Hill Education
5. Hanes et al "IoT Fundamentals", Cisco Press
6. Vijay Madisetti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", , Paperback, 2015.
A. McEwen, H. Cassimally, "Designing the Internet of Things", Wiley, 2013.
7. Yashwant Kanetkar, "21 Internet of Things Experiments", Kindle edition
8. Adeel Javed, "Building Arduino projects for Internet of Things", Apress publication
9. Donald Noris, "The Internet of Things: Do it yourself Projects with Arduino, Raspberry PI and
10. BeagleBone Black" Mc Graw Hill Publication
11. Adrian McEwen & Hakim Cassimally, "Designing the Internet of things", Willey publication
12. Rahul Dubey, "An Introduction to Internet of Things: Connecting Devices, Edge Gateway, and Cloud with Applications", Cengage India Publication



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13. Raj Kamal, "Internet of Things: Architecture and Design Principles, Mc Graw Hill Education
14. Hanes et al "IoT Fundamentals", Cisco Press
15. Vijay Madiseti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", , Paperback, 2015.
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20. BeagleBone Black" Mc Graw Hill Publication
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Suggested Course Practical List:

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

List of Laboratory/Learning Resources Required:

False Twist Texturing Machine, Draw texturing machine, Air jet texturing machine, Friction texturing machine, Dynafil M tester.
