

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

**COURSE CURRICULUM
COURSE TITLE: ADVANCE TEXTURISING & TWISTING
(COURSE CODE: 3352903)**

Diploma Programme in which this courses offered	Semester in which offered
Textile Manufacturing Technology	5 th Semester

1. RATIONALE

The technology of texturising, crimping and twisting has changed rapidly in last few decades. The need of industries is highly skilled technician, in this area and so this course is very important. This course will make the student aware in advance technologies and the advance sophisticated machines being used in the industry.

2. LIST OF COMPETENCY

The course content should be taught and implemented with the aim to develop required of skills in the students so that they are able to acquire following competency.

- **Undertake the advanced texturising and twisting process effectively in textile manufacturing plants.**

3. COURSE OUTCOMES

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- Describe the process of Texturising and twisting to implement.
- Describe the False Twist Texturising and Miscellaneous Texturising Systems in order to implement effectively
- Describe the Twisting and Processing of Microfilament on Texturising Machine to implement effectively
- Identify the Textured Yarn Fabric Defects
- Describe the Air Jet Texturising process and quality control of Textured yarns to implement effectively

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	ESE	PA	150
3	0	2	5	70	30	20	30	

Legends: L-Lecture; T – Tutorial/Teacher Guided Student Activity; P –Practical ;C – Credit;; ESE -End Semester Examination; PA - Progressive Assessment.

5. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit – I Texturising and Twisting process	1a. Describe the need of Texturising. 1b. Compare the various textured yarn configuration. 1c. State the need for filament twisting. 1d. Compare the salient features of different types of twisting machines. 1e. Describe the Ring twister/Desk twister/ TFO.	1.1 Texturising, Types of textured yarn, different methods of Texturising process. 1.2 Filament twisting process, Structure of twisted yarn, Effect of twisting on yarn properties. 1.3 Types of twisting machines 1.4 Ring twister/Deck twister / TFO
Unit– II False Twist Texturising and Miscellaneous Texturising Systems	2a. Explain principle of false twist Texturising 2b. Determine factors affecting false twist textured yarn. 2c. Differentiate between friction and pin twisting. 2d. Distinguish the features of Nip and Ring Twister.	2.1 Principle of False twist Texturising. 2.2 False twist textured yarn. 2.3 Friction twisting and Pin twisting. 2.4 Nip Twister and Ring Twister.
	2.5 Describe the features of the stuffer box Texturising machine. 2.6 Explain the working principle of Edge crimping process. 2.7 Explain the principle of Gear Crimping process. 2.8 Describe the Knit-De-Knit texturising process	2.5 Bulked Yarn Stuffer Box. 2.6 Edge Crimping. 2.7 Gear crimping. 2.8 Knit –De- Knit Texturising Methods.
Unit–III Twisting and Processing of Microfilament on Texturising Machine	3a. Differentiate twisting and Direct warping and sizing. 3b. Describe processing of microfilament on Texturising Machine.	3.1 Twisting and Direct Warping and Sizing. 3.2 Processing of microfilament of Texturising Machine.
Unit–IV Textured Yarn Fabric Defects, Production and Calculation of Texturising and Twisting Machine	4a. Identify textured yarn fabric defects. 4b. Calculate production of Texturising and Twisting Machine.	4.1 Textured Yarn Fabric 4.2 Defects, Causes and Remedies. 4.3 Production calculation of Texturising and Twisting Machine.

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Unit-V Air Jet Texturising and Quality Control of Textured Yarns	5a. Explain the principle of Air-Jet Texturising. 5b. Identify different types of Jets for Air-Texturising. 5c. Explain effect of process variables on Yarn Quality. 5d. Analyze Testing and quality control of Air-textured yarn. 5e. Test denier, yarn tensile properties and crimp.	5.1 Air jet Texturising machine. 5.2 Types of jets for Air Texturising. 5.3 Process variable on textured yarn quality, properties and end users of air jet textured yarn. 5.4 Testing and quality control of air textured yarn. 5.5 Test denier and its variation. 5.6 Test yarn tensile properties. 5.7 Test spin finish content. 5.8 Test crimp permanency and crimp Contraction.

6. SUGGESTED SPECIFICATION TABLE WITH HOURS and MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total
I	Texturising and Twisting process	6	4	4	2	10
II	False Twist Texturising and Miscellaneous Texturing Systems	12	4	10	4	18
III	Twisting and processing of micro filaments on Texturising machine.	4	2	2	2	6
IV	Textured Yarn Fabric Defects, Production and Calculation of Texturising and Twisting Machine.	6	2	4	4	10
V	Air Jet Texturising and Quality Control of Textured yarns.	14	6	12	8	26
	Total	42	18	32	20	70

Legends: R = Remember; U= Understand; A= Apply and above levels (Bloom's Revised 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.

7. SUGGESTED LIST OF EXERCISES / PRACTICALS:

The practical/exercises should be properly designed and implemented with an attempt to develop abilities and skills (**outcomes in psychomotor and affective domain**) so that students are able to acquire and demonstrate the course learning and programme outcomes. Following is the list of practical exercises for guidance.

Note: Here performance outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed and demonstrated appropriately, they would contribute to the development of demonstrated learning in behavioral terms in affective domain. As a whole, the total approach towards acquisition of knowledge, skills, abilities and

*behavior and demonstration of the same would lead to the development of **Course Outcomes**. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.*

Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Hrs. required
1	I	Obtain important features and need of Texturising process.	02
2	II	Draw and explain with sketch Principle of false twist Texturising.	04
3	II	Demonstrate features of different heating mode and different twisting units.	02
4	III	Demonstrate feeding system in False Twist Texturising.	02
5	III	Demonstrate edge crimping and stuffer box process.	04
6	III	Demonstrate knit de knit Texturising process.	02
7	III	Demonstrate Draw Texturising Machine.	04
8	IV	Test denier and its count variations, tensile properties, crimp contraction.	04
9	IV	Identify and rectify the textured yarn fabric defects	02
10	V	Test variable effect on Textured Yarn Quality.	04
11	V	Identify different types of jets.	02
12	V	Demonstrate Air jet Texturising process.	04
		TOTAL (Perform any practical worth 28 hours so that most units are covered)	34

8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like: course/ based seminars, internet based assignments, teacher, guided self learning activities, and course/library/internet/ lab based mini-projects---etc.

- i. Collection of sample of various applications of textured yarns.
- ii. Collect the details of different types of textured yarns.
- iii. Visit to Texturising unit, and prepare report with sketches.

9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

- i. Show Educational video and CDs related to latest practices of texturising and twisting
- ii. Show models and charts of different equipment/machines and processes.
- iii. Demonstrate the sample of different types of textured and twisted yarns.
- iv. Ask students to analyze the fabric defects for texture yarn.
- v. Arrange Expert lectures.

10. SUGGESTED LEARNING RESOURCES**A) List of Books**

S. No.	Title of Books	Author	Publication
1	A Guide to Crimping/Texturing Technology	Rao, M.V.S. and Mr. A.B. Talele	Man-Made Textile Research Association
2	Yarn Texturing Technology	The Textile Institute	The Textile Institute
3	Synthetic Filament Yarn Texturing Technology	Demir A., and H.M.	
4	The Production of Textured yarns Methods others than the false twist Techniques	Wilson, D.K.	
5	The production of Textured yarns by Methods other than false Twist Techniques	Wilson, D.K. and T. Kolla	

B) List of Major Equipment/ Instrument with Broad Specifications

- i. Textile Laboratory

C) List of Software/Learning Websites

- i. [http:// www.britannica.com/EBchecked/topic/589524/textured-yarn](http://www.britannica.com/EBchecked/topic/589524/textured-yarn)
- ii. <http://en.wikipedia.org/wiki/Texturizing>
- iii. [http:// textilelearner.blogspot.com/.../yarn-texturing-method-different.html](http://textilelearner.blogspot.com/.../yarn-texturing-method-different.html)
- iv. [http:// www.woodheadpublishing.com/en/book.aspx?bookID=536](http://www.woodheadpublishing.com/en/book.aspx?bookID=536)
- v. [http:// textilelibrary.weebly.com/air-texturizing-process.html](http://textilelibrary.weebly.com/air-texturizing-process.html)
- vi. www.textileworld.com/Resource.../Yarn_Texturing_Technology

11. COURSE CURRICULUM DEVELOPMENT COMMITTEE**Faculty Members from Polytechnics**

- **Prof. R T Patel**, Lecturer in Textile Manufacturing, R.C T I, Ahmedabad
- **Prof. B.B. Bhatt**, Lecturer in Textile Manufacturing, B.P.T I, Bhavnagar
- **Prof. S.M.Zala**, Lecturer in Textile Manufacturing, Sir B.P.T.I, Bhavanagar
- **Prof. Mrs. P.M.Parmar**, Lecturer in Textile Manufacturing, R.C T I, Ahmedabad

Co-ordinator and Faculty Member from NITTTR Bhopal

- **Dr. C.K.Chugh**, Professor, Department of Mechanical Engineering
- **Dr. Joshua Earnest**, Professor, Department of Electrical and Electronics Engineering