



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Master of Engineering.

Branch: Textile Engineering

Course / Subject Code : ME01025051

Course / Subject Name : Advances in Yarn manufacturing

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

Prerequisite:	Student should have idea about basic yarn manufacturing technology and processes.
Rationale:	The Advanced yarn manufacturing subject will cover various modern yarn preparation technology advances to modern yarn preparation technology with their quality parameters.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Apply knowledge for the manufacturing Process of various advanced yarns.
02	Solve the complex technical problem in manufacturing of advanced yarn.
03	Identify and analyze the structural difference of advanced yarn.
04	Design the automation required in the machineries

**Revised Bloom's Taxonomy (RBT)*

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



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Master of Engineering.

Branch: Textile Engineering

Course / Subject Code : ME01025051

Course / Subject Name : Advances in Yarn manufacturing

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Principle of open end spinning; description of the working of the rotor spinning; requirements of the raw materials; preparation of the sliver for rotor spinning; yarn formation and its structure; yarn withdrawal and winding; design of rotor, opening roller, transport tube, navel and their implications on production and yarn quality; developments in rotor spinning machine; production limits; process control; techno economic comparison with ring spinning.	12	25
2.	Principle of yarn formation - DREF-2, DREF-3 spinning systems; developments in friction spinning systems; raw material requirement; effect of process variables on yarn quality; application of these machines for different end products; the economics; technological limitations.	9	20
3.	Description of the yarn production in air jet spinning machine; feasibility of higher draft applied in this machine; structure and quality of the air-jet spun yarn; raw materials requirement; process variables; production of by Airvortex system.	8	25
4.	Production of yarn in PLYfil , parafil, disc spinning, rubbing technique recpo, electrostatic, working details of the production of double-rove yarns, wrap yarns and core spun yarns; compact yarn, use of raw materials; economics of these methods of yarn production; yarn characteristics and their applications.	8	20
5.	Adhesive spinning system, mechanism of twist-less spinning, take-ja process, pavena process Bobtex spinning systems; properties of such yarn, their usefulness and applications.	8	15
Total		45	100

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



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering
Level: Master of Engineering.
Branch: Textile Engineering

Course / Subject Code : ME01025051

Course / Subject Name : Advances in Yarn manufacturing

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. Oxtoby E., "Spun Yarn Technology", Butterworths, London, 1987.
2. Klein W., "New Spinning Methods ", The Textile Institute, Manchester, 1993.
3. Dyson E., "Rotor Spinning, Technical and Economics Aspects ", Textile Trade Press, New Mills, Stock Port, 1975.
4. Salhotra K.R. and Ishtiaque S.M., " Rotor Spinning; its advantages ", Limitations and Prospects in India, ATIRA, Ahmedabad, 1995.
5. Lord P.R, " Yarn Production; Science, Technology and Economics ", The Textile Institute, Manchester, 1999.
6. Trommer G., "Rotor Spinning", MelianTextilebenchte GmbH, Rohrbacher, 1995.
7. Lawrence C.A and Chen K.Z., "Rotor Spinning ", Textile Progress, The Textile Institute, Manchester, 1984.
8. Lawrence C. A., "Advances in yarn spinning technology" Wood head publishing, 2010, ISBN-13: 978 1 84569 444 9.

(b) Open source software and website:

<https://nptel.ac.in>, World Wide Web, Google Search Engine etc

Suggested Course Practical List: If any

1. To study the passage of yarn through rotor spinning machine.
2. To study the yarn formation mechanism in rotor spinning machine.
3. To study the various parameters like opening roller wire profile and speed, Rotor speed, rotor diameter, rotor groove, side wall angle and draw off nozzle which are influencing the rotor yarn structure and characteristics.
4. Production calculation of rotor spinning.
5. To study the passage of yarn through MJS, MTS and MVS air jet spinning machine.
6. To study the working principle of air jet spinning system and the characteristics of yarn and its application.
7. To study the passage of yarn through DREF1, DREF2, DREF3, DREF5, DREF2000, DREF3000
8. Friction spinning machine.
9. To Study the working principle of all friction spinning machine and yarn characteristics and application of friction spun yarn.
10. Production of yarn by using twist less, self twist, wrap spinning, siro and solo spun yarn technique.
11. Use of the various types of spinning methods for the production of core spun yarn.
12. Working principle of the compact spinning system.



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Master of Engineering.

Branch: Textile Engineering

Course / Subject Code : ME01025051

Course / Subject Name : Advances in Yarn manufacturing

13. To study the basic properties of yarn produced by using the various spinning methods.
14. To study about the modern developments in various spinning techniques.

List of Laboratory/Learning Resources Required:

Rotor spinning machine, Airjet spinning machine, Friction spinning machine, Twist less spinning machine.

Suggested Activities for Students: yarn characteristics analysis of various spinning system.

* * * * *