



# GUJARAT TECHNOLOGICAL UNIVERSITY

**Bachelor of Engineering**  
**Subject Code: 3162904**

**Semester: B.E. Semester VI**

**Subject Name: Technical Textiles**

**Type of course:** Professional Core Course

**Prerequisite:** Students should have knowledge of fibre, yarn and fabric manufacturing processes

**Rationale:** Technical textiles has witnessed maximum growth rates in India and elsewhere. The application areas are widening every year due to efforts of research activity throughout the globe. Recent developments have taken place in some of the important segments of technical textiles are covered in this course.

**Teaching and Examination Scheme:**

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE (E)	PA (M)	ESE (V)	PA (I)		
4	0	0	4	70	30	0	0	100

**Content:**

Sr. No.	Content	Total Hrs
1	Introduction: Definition and scope for technical textiles, Classification of technical textiles, Present market scenario of technical textiles.	3
2	Technical fibres and yarns used in manufacturing of technical textiles.	4
3	Technical fabrics – Woven fabric, knitted fabric, leno weaving in technical applications.	6
4	Technical fabrics non-woven fabric for technical applications – Introduction to nonwoven manufacturing, Advances in various methods for web formation and bonding, Characteristics and properties of various nonwoven structures.	10
5	Applications of composites in technical textile.	3
6	Finishing of technical textiles, coating and lamination, functional finishes – flame retardant finish, anti-microbial finish, anti-viral finish, water-proof finish.	5
7	Application of Nanotechnology in technical textiles.	4
8	Medical textiles : Classification, Specialty fibres used in manufacturing, Processes, Essential properties and Applications.	4
9	Protective textiles : Different types of protective textiles, Raw material, Important properties and applications.	4
10	Clothtech and Hometech : Functions and applications.	2



# GUJARAT TECHNOLOGICAL UNIVERSITY

## Bachelor of Engineering Subject Code: 3162904

11	Sportech : Raw material and various applications of sport textiles.	3
12	Oekotech : Different applications for environmental protection.	2
13	Other applications of technical textiles : Agrotech, Buildtech, Geotech, Mobiltech, Indutech, Packtech : Functions and applications.	6

### 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
10	20	30	5	5	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. Horrocks A.R. & Anand S. C., "Handbook of Technical Textile Part I & II", The Textile Institute, 2<sup>nd</sup> Edition, 2016
2. George Kellie, "Advances in Technical Nonwovens", Woodhead Publishing in association with The Textile Institute, 2016.
3. Sabit Adanur, "Wellington Sears Handbook of Industrial Textiles", The Textile Institute, 1995
4. Horrocks A.R. & Anand S. C., "Handbook of Technical Textiles", Woodhead Publication Ltd., 2000.
5. R. Senthil Kumar, "Textiles for Industrial Applications", CRC Press, 2014.
6. Sabit Adanur, "Handbook of weaving", Technomic publication, 2003
7. Russel S. J., "Handbook of Nonwoven", Woodhead Publication, 2007
8. Richard A. Scott, "Textiles for Protection", The Textile Institute, 2005
9. R. Alagirusamy and A. Das, "Technical textile yarns", Woodhead Publishing Limited in association with The Textile Institute, 2010.

**Course Outcomes:** After learning the course, students should be able to:

Sr. No.	CO statement	Marks % weightage
CO-1	Establish relationship amongst various fibre, yarn and fabric with the properties, product design and technical textiles.	20
CO-2	Acquire more knowledge in fundamental concepts of production of nonwoven fabric manufacturing.	20



# GUJARAT TECHNOLOGICAL UNIVERSITY

## Bachelor of Engineering Subject Code: 3162904

CO-3	Acquire advanced understanding about various areas of application of technical textiles including composites.	30
CO-4	Identify the applications of various finishes on technical textiles products.	10
CO-5	Characterize the product and their performance used in technical textiles.	20

**Major Equipment:** Nonwoven fabric production systems like Needle punching, Spun lacing, electrospinning machine, Weft and warp knitting machine, Coating machine etc.

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