GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering
Subject Code: 3162915

Semester VI

Subject Name: Engineering Applications of Textiles

Type of course: Open Elective

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

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 specifically engineering applications have taken place in some of the important segments of technical textiles and are covered in this course.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE (E)	PA (M)	ESE (V)	PA (I)	
3	0	0	3	70	30	0	0	100

Content:

Sr. No.	Content	Total Hrs
1	Recent advances in technical fibers like; nanofibers, auxetic fibers, piezoelectric fibers, photovoltaic fibers, shape memory fibers etc. filament technical yarns like; aramid, glass, carbon, HDPE and others.	**4**
2	Introduction to ropes, cord, twine, webbing and nets and their applications.	**4**
3	Application of technical textile in filtration, dust collection, solid-liquid separation, nanofibers in filtration, brief idea about material construction	**6**
4	Application of technical textile in civil engineering, geotextiles and its properties, various applications of geotextile	**8**
5	Application of technical textile in transportation, applications for vehicles like trims, seat belts, air bags, filters, separators, liners, tires, hoses etc., applications in marine and aviation in short.	**8**
6	Applications of technical textile in packing, agriculture and buildings	**8**
7	Textile reinforced Composites and their applications for various industries	**4**

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, 2nd Edition, 2016
2. Sabit Adanur, "Wellington Sears Handbook of Industrial Textiles", The Textile Institute ,1995
3. R. Senthil Kumar, "Textiles for Industrial Applications", CRC Press, 2014.
4. Walter Fung and Mike Hardcastle, "Textile in Automotive Engineering", Woodhead Publishing Ltd, 2001

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 application in industry.	20
CO-2	Acquire knowledge in fundamental concepts of production of geo textiles and applications.	20
CO-3	Acquire understanding about various areas of application of technical textiles in transportation.	20
CO-4	Identify the applications of various textile materials in agriculture, packing and building.	20
CO-5	Characterize the product and their performance used in industrial 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.