GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: UG

Branch: Textile Technology

Subject Code: BE05000531

Subject Name: Textile for Engineering Application

w. e. f. Academic Year:	2024-25
Semester:	5
Category of the Course:	MOPEC-02

Prerequisite:	Students should have knowledge of basics of textile fibres and yarn manufacturing, fabric manufacturing techniques, basic mechanics and polymer science.
Rationale:	Textiles are no longer limited to conventional apparel applications. Modern engineering applications require textiles in medical, automotive, composites and industrial application. This subject provides an understanding of textile materials as engineering materials, focusing on structure, property and performance relationships and advanced functional applications.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Classify various fibers, yarn and fabric use as engineering materials.	R, U
02	Classify technical textiles based on their functional requirements and diverse industrial application areas.	R, U
03	Select appropriate textiles material for medical and automotive textile	A, N, E
04	Analyze the synergistic role of matrix and reinforcement in textile composites to determine their suitability for specialized engineering applications.	U, A, N
05	Identify specialized textiles for geotextile, agricultural, industrial and packaging application.	R, U, A

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme:

Teaching / Learning Scheme (in Hours per semester)					Total Credits	Assessment Pattern and Marks					Total Marks
						Theory		Tutorial / Practical			
L	T	P	TW/ SL	Total no of hours per semester		ESE (E)	PA / CA (M)	PA/ CA (I)	TW/ SL (I)	ESE (V)	
45	0	0	15	60	2	70	30	20	30	0	150

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Fiber, Yarn, and Fabric Structures Use for various engineering applications - Natural Fibers, Synthetic Fibers, High-Performance Fibers, type of Yarn, Fabric Structure -Woven, Knitted, Braided and Nonwoven	10	22
2.	Technical Textile – Introduction, Definition and scope for technical textiles, Classification of technical textiles, Present market scenario of technical textiles.	6	13
3.	Medical textiles - Classification, Specialty fibres used in manufacturing, Processes, Essential properties and Applications.	8	18
4.	Automotive textile - applications for vehicles like trims, seat belts, air bags, filters, separators, liners, tyres, hoses etc., applications in marine and aviation.	8	18
5.	Textile Composites - Definition, classification of composites, function of the matrix and reinforcement in composites, advantages & disadvantages of composites, properties of composites, application of composites structural components, ballistic, aerospace, automotive, medical, sporting goods, marine, infrastructure etc.	8	18
6.	Application of textile in packing, agriculture, Geotextiles, Textiles in Ropes	5	11
	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**
20	30	25	15	5	5

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. Handbook of Technical Textiles – A. R. Horrocks & S. C. Anand
2. High Performance Fibres – J. W. S. Hearle
3. Textile Materials – W. E. Morton & J. W. S. Hearle

4. Principles of Woven Fabric Manufacturing – Abhijit Majumdar
5. Handbook of Industrial Textiles – Sabit Adanur
6. R. Senthil Kumar, "Textiles for Industrial Applications", CRC Press, 2014.

(b) Open source software and website:

1. https://nptel.ac.in
2. World Wide Web, Google Search Engine etc.

Suggested Course Practical List:

List of Laboratory/Learning Resources Required:

Suggested Project List:

Suggested Activities for Students:

1. Industry visit
2. Assignment on material selection
3. Case study on application of textile in various industry
4. Online course - NPTEL

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