

# GUJARAT TECHNOLOGICAL UNIVERSITY

## TEXTILE ENGINEERING (25) ENGINEERING APPLICATIONS OF TEXTILE SUBJECT CODE: 2722514 SEMESTER: II

**Type of course:** Open Elective

**Prerequisite:** Zeal to learn a subject of other discipline

**Rationale:** Applications of textile materials in non textile areas in various forms is increasing every year. There have been newer applications developed continuously. The post graduates of other disciplines are required to understand the way in which particular textile material is applied which will be quite beneficial.

### Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	ESE (V)		PA (I)			
ESE	OEP	PA			RP					
3	2#	2	5	70	30	20	10	10	10	150

### Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	Introduction to textile materials like fiber, yarn and fabrics. Brief account of manufacturing processes like spinning, weaving, knitting, nonwoven, braiding, chemical processes, coating, laminating etc. Brief idea about technical textiles.	10	25
2	Idea about geotextiles, geosynthetics, etc. Application of textiles in civil engineering like filtration, drainage, separation, barrier, landfill etc. Reinforcement using fibrous materials. Use of natural fibres in geotextiles.	10	25
3	Basic Idea About: Textile reinforced composite materials. Heat and flame protection through textile materials. Textiles in Filtration, Medical Textiles, Use of textile for defence.	10	25
4	Use of textile in transportation. Fiber requirements. Basic idea about composites. Use of textiles in passenger cars, textiles in other road vehicles. Rail applications. Textiles in air craft. Marine applications.	10	25

### Reference Books:

1. Wulfhorst B., Gries T. & Veit D., "Textile Technology", HANSER Publishers, 2006
2. "Reference Book – Textiles", ACIMIT, 2000
3. Horrocks A.R. & Anand S.C., "Handbook of Technical Textiles", The Textile Institute, 2000
4. Fangueiro R., "Fibrous and Composite Materials for Civil Engineering Applications". Woodhead Publishing, 2011
5. Fung W. & Hardcastle M., "Textiles in Automotive Engineering", The Textile Institute, 2001
6. Sarsby R.W., "Geosynthetics in Civil Engineering", The Textile Institute, 2007

**Course Outcome:**

After learning the course the students should be able to:

1. Become familiar with the raw material used for making textile products.
2. Understand the various introductory aspects of the production process for making textile goods.
3. Learn application of textiles in various ways for civil engineering applications.
4. Learn the use of textiles in transportation sector.
5. Understand importance & application areas of textile materials for protection, filtration, medical etc.

**List of Experiments:**

1. Classification and identification of textile fibres.
2. Demonstration of filament manufacturing methods.
3. Spun yarn spinning systems
4. Weaving preparatory processes.
5. Fabric manufacturing methods.
6. Chemical Processing of Textile materials.
7. Count Testing of yarn.
8. Reinforcing using textile materials
9. Application of textile material for automotive.
10. Application of textile material for medical purpose.

**Open End Problems**

1. Summarize production and consumption of textile fibres – Globally and in India.
2. Analyze various newer methods of making textile products.

**Major Equipments:** Basic equipment for making spun yarn, woven, nonwoven and knitted fabric, testing of materials, coating and laminating lab models.

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

**Review Presentation (RP):** The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.