B E III Textile Technology: Semester –V

Subject Name: Textiles in Transportation **Subject Code: BTTT15504**

Type of course: Open Elective Course I

Prerequisite (if any): Basic knowledge of yarns, fabrics and technical textiles.

List of Courses where this course will be prerequisite:

Rationale: This course covers various applications of textile materials in the MOBILTECH segment of Technical Textiles. Products developed for land-Air/Space-Water transportation, their processing and requirements of quality standards are the part of this course.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	2	4	60	25	15	30	20	150

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests CA2: Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Content	Total Hrs
1	Introduction, Fabric structures – woven, warp knitted, weft knitted, flat bed knitting, nonwovens and their production methods,	8
2	Yarn and fabric processing – Dyeing and finishing, printing, Coating and lamination	6
3	Quality assurance and testing – Test method details	6
4	Product engineering – Seats, headliners, door casing, parcel shelves, other interior trims, complete modular interior, Other textile applications – seat belts, air bags, carpets, cabin air filters, battery separators, tyres, hoses and belts etc.	10
5	Automotive textiles and environment	7
6	Textiles in other forms of transportation – composite materials, flame retardancy, railway applications, marine applications, textiles in aircrafts, new developments and opportunities	8
		45

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
20	**30**	**30**	**10**	**5**	**5**

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:

Sr no	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1	Textiles in Automotive Engineering	Walter Fung and Mike Hardcastle	The Textile Institute, Woodhead Publishing Ltd., ISBN 1 85573 493 1	2001	1
2	Textile Advances in the automotive industry	R. Shishoo	The Textile Institute, Woodhead Publishing Ltd., ISBN 978-1-84569-331-2 (book), ISBN 978-1-84569-504-0 (e-book)	2008	1

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Describe the structures of fabrics and their methods of production.	20
CO-2	Know the different methods of yarn and fabric processing.	15
CO-3	Know the different methods of testing of materials used in transportation.	15
CO-4	Know different products available for used in transportation textiles.	20
CO-5	Know the environmental influences of automotive textiles	10
CO-6	Know different forms of textiles and new developments for transportation textiles.	20

List of Open learning website: Any Search Engine, World Wide Web, Google Search Engine etc.

List of Open Source Software: NPTEL, Swayam portal etc.

FOR LAB SESSIONS:

List of Experiments:

1. Passage of materials through different parts of shuttle weaving machine.
2. Passage of materials through different parts of shuttleless weaving machine.
3. Studies of different weaves of woven fabrics.

4. Passage of materials through different parts of weft knitting machine.
5. Passage of materials through different parts of warp knitting machine.
6. Studies of different structures of knitted fabrics.
7. Studies of different types of nonwoven fabrics.
8. Testing of fibres used in automotive textiles for different properties.
9. Testing of yarns used in automotive textiles for different properties.
10. Testing of fabrics used in automotive textiles for different properties.
11. Studies of different products designed and developed for land transportation vehicles.
12. Studies of different products designed and developed for air/space transportation vehicles.
13. Studies of different products designed and developed for water transportation vehicles.
14. Studies of recently developed products used in automotive textiles.

Major Equipment Needed: Shuttle weaving machine, shuttleless weaving machine, weft knitting machine, warp knitting machine, tensile and other properties testing equipment