



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code:3172610

Semester – VII

Subject Name: TYRE and TUBE TECHNOLOGY

Type of course: Professional Core Course

Prerequisite:

Rationale:

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)	
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs
1	Introduction & Terminology production of variety of tyres in India & abroad.	03
2	Structure of The Pneumatic Tyre: Functions of the pneumatic tyre, tube & assembly, Construction of tyre tread casing & bead general features, Principles of Cross-ply, radial & bias-belted construction, tubeless tyre, Tyre construction methods, Cord path, Aspect ratio.	05
3	Tyre Manufacture: Composition of tyre, compounding of tyre tread cap tread base, carcass, bead, sidewall, inner liner etc. Raw materials for tyre, Mixing, Dipping, Calendaring, Extrusion, stock preparation, tyre building, green tyre preparation, tyre curing, PCI, finishing of tyre. Manufacturing process of radial tyre.	05
4	Tyre Cord & Cord To Rubber Bonding: Physical properties of tyre cords from cotton, rayon, nylon etc. Outline of bonding methods, etc	04
5	Tyre Design: Tyre structure, tyre shape, treads design. Tyre size determination.	05
6	Tyre Performance Analysis: Analysis of tyre for different performance criteria like tyre stresses & deformation, tyre stiffness, tyre noise, rolling resistance, aquaplaning etc.	05
7	Tyre Evaluation: Evaluation of tyres by machine tests, Contact pr. & its relation to traction & wear, tyre steering & road interaction. Tyre testing – destructive and non destructive.	05
8	General Developments: In material construction & performance assessments. Tyre Standards. Performance & design criteria, manufacturing of cycle, Motor cycle, automobile, truck, earthmover, air-craft & tubeless tyre.	03



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9	Tubes: Principles of tube design, mfg. tubes, extrusion, valve jamming, inflation & Curing in presses, tube testing.	04
10	Flaps: Properties, Compounding, Manufacturing and testing of flaps.	03
11	Retreading: Criteria for retreading, methods of retreading.	03

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	10	15	15	10	10

**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. Rubber Products Manufacturing Technology By: Anil K. Bhowmick
2. Tyre Technology By: Tom French.
3. Tyre Manufacturing & Engineering By: F. J. Kovac.

Course Outcome:

After learning this course students will be able to:

Sr. No.	CO statement	Marks % weightage
CO-1	Illustrate the structure of pneumatic tyre and explain the tyre manufacturing process	15
CO-2	Compare different types of tyre according to their structure, shape, size, and tread design	15
CO-3	Analyze and Evaluate the tyre Performance	15
CO-4	Explain the principles, manufacturing process and testing of tube and flap	15
CO-5	Summarize the importance of Retreading	10

List of Experiments:

Tutorials/Presentation/Practicals based on above topics.



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Major Equipments:

Mixing mill, Calender Machine Extruder, Semi Hydraulic Press etc.

List of Open Source Software/learning website:

- <http://www.checkthatcar.com/>
- <http://www.continental-tires.com/>
- <http://www.altairatc.com/>