

5 th Semester	RAU5D003	Fundamentals of Tyre Technology	L-T-P 3-0-0	3 CREDITS
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MODULE I (8 HOURS)**An Overview of Tyre Technology**

Introduction, tyre basic function, tyre types, diagonal belted bias, radial bias tyre components, radial tyre components, radial tyre design process, tyre performance criteria, indoor test and outdoor test, tyre manufacturing- compound preparation, calendaring tyre assembly, curing, inspection, quality control tests.

MODULE II (8 HOURS)**Tyre Forces and Moments**

Forces and moments, rolling resistance, cornering properties, slip angle and cornering force, performance of tyre on wet surface, ride properties of tyres.

MODULE III (7 HOURS)**Rubber Abrasion and Tyre Wear**

Sliding abrasion, tyre wear, influence of road surface- driving influences, speed and load distributions, road wear and force distribution, tyre construction.

MODULE IV (7 HOURS)**Tyre Inspection Technology and Testing**

Introduction of inspection techniques, x-ray examination, shearography, ultrasound, eddy currents.

MODULE V (9 HOURS)**Introduction to Tire Safety**

Durability and failure analysis, service- maintenance safety, on vehicle in-service safety, fundamentals of tyre durability, nature of tyre durability- deflection, heat, speed, tyre structural failures, common in-service tyre failure modes, run low/ flux break- tyre tread bead detachment- rapid air loss, over deflection- intra-carcass pressurization- cuts and punctures- improper repair- improper repair- tyre defects.

Books

- [1] J. Y. Wong, "Theory of Ground Vehicles", 4th edition 2008
- [2] US Department of Transportation., "The Pneumatic Tire", February 2006 reference books/other reading material
- [3] Reza N. Jazar, "Vehicle Dynamics: Theory and Application" Springer 2008
- [4] Hans B. Pacejka, "Tire and Vehicle Dynamics", 3rd edition, 2002
- [5] Rajesh Rajamani, "Vehicle Dynamics and Control", Springer Science & Business Media, 2006.