AE-311: Tyre Technology										
L	**T**	**P**	Credit	Area		**CWS**	**PRS**	**MTE**	**ETE**	**PRE**
3	0/1	2/0	4	DEC		15/25	25/-	20/25	40/50	-

Objectives: This course aims to introduce the students with types of tyres used for different vhicles, design of tyres, manufacturing of tyres and testing of tyres.

AE-311: Tyre Technology		Contact Hours
Unit-1	**Introduction:** Importance of tyres, history, current status, functions of pneumatic tyres, applications, types of tyres, desirable tyre properties, classification of tyres based on carcass, tyre profile, geometry, sizing & designation, tyre components, principle of pneumatic tyre, requirements of pneumatic tyres.	**8**
Unit-2	**Tyre Design:** General, motion forces, heat build-up, types of bonding, set of service conditions, tyre size requirements, safety requirements: Tread design, general, role of foot print area and factors affecting tread life, various types of tread pattern	**6**
Unit-3	Carcass design, role of foot print area and factors affecting tread life, various types of tread pattern. Carcass design, role of various fibers used in carcass, estimation of number of piles, Bead design, single bead, multiple beads, and various configurations of wires in bead assembly.	**6**
Unit-4	**Compound Design:** General introduction, role of various mixing ingredients, various recipes.	**8**
Unit-5	**Manufacture Technology:** Compound mixing, mixing equipment's, extrusion of components, tyre cord, wire cord manufacture, calendaring tyre manufacture, mold procurement, component preparation, green tyre building, pre-curing, curing and post curing operations/treatments.	**8**
Unit-6	**Tyre testing/ Evaluation Methods:** General safety standards, carcass strength, resistance to bead unseating, machine simulation test, indoor laboratory testing, field-test on road, proving ground, lates testing techniques.	**6**
	Total	**42**

Reference Books:	
1	Tyre Technology, S.N. Chakravarty, Indian Rubber Institute
2	Roop S. Bhakuni, Surendra K. Chawla, D. K. Kim,D.Shuttleworth,Tires Cord, Encyclopedia of Chemical Technology, Kirk &Othmer, John Wiley & Sons, 2000
3	E.C. Wood, Pneumatic Tyre Design, W. Heffer, 1952
4	Tire Engineering, Kovac& Rodgers, Goodyear Tire Rubber Co., Ohio 3. Handbook of Rubber Technology, R. Schuster, Wiley Interscience

Course Outcomes

CO1	To understand about history of tyres, pneumatic tyres, sizing & designation, tyre components.
CO2	To understand aboutTyre Design with its some components..
CO3	To understand about Tyre Design with its all components with safety requirements
CO4	To understand about Compound Designandrole of various mixing ingredients,
CO5	To understand about all manufacture technology of tyres.
CO6	To understand abouttyre testing/ evaluation methods with safety standards.

CO-PO/PSOMatrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	2	0	0	0	0	0	0	2	2	1	1
CO2	3	3	2	3	1	0	0	0	0	0	0	1	2	1	1
CO3	3	3	3	3	1	0	0	0	0	0	0	2	3	3	2
CO4	3	3	3	3	1	0	0	0	0	0	0	1	3	3	2
CO5	2	2	2	2	2	0	0	0	0	0	0	1	2	2	2