

5 th Semester	RAU5C003	Automotive Chassis	L-T-P 3-0-0	3 CREDITS
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MODULE-I**(10 HOURS)****Frames, front axle and Steering systems:**

Types of Chassis layout, with reference to Power Plant location and drive, types of frames, unitised frame body construction, Loads acting on frame, Constructional details and materials for frames, Testing of frames.

Types of Front Axles, Front Wheel Geometry, namely- Castor, Camber, King Pin Inclination and Toe-in, Condition for True Rolling Motion of Wheels, Ackerman's and Davis Steering System, Constructional details of Steering Linkages and layouts, Different Types of Steering gearboxes, Reversible and Irreversible Steering, Power-Assisted Steering, Steering of crawler tractor.

MODULE-II**(8 HOURS)****Driveline:**

Effect of driving thrust and torque reaction, Hotchkiss drive, torque tube drive, radius rod, Propeller Shaft, Universal Joint, Constant Velocity Universal Joint, Front Wheel drive, different types of Final drive, Worm and worm wheel, Straight bevel gear, Spiral bevel gear and hypoid gear final drives, Double reduction and twin speed final drives, Multi-axled vehicles, Differential principle and operation, Construction details of differential unit, Differential housings, Non-Slip differential, Differential locks, Final drive of Crawler Tractors.

Module-III**(8 HOURS)****Rear Axles**

Construction of Rear Axles, Types of Loads acting on Rear axles, Full Floating, Three Quarter Floating and Semi-Floating rear axles, Rear axle Housings, Construction and different types of axle housings, Multi axle vehicles. Construction details of multi drive axle vehicles, Types of tyres and their constructional details.

Module-IV**(6 HOURS)****Suspension System**

Need of suspension system, types of suspension, construction details and characteristics of suspension springs such as leaf springs. Coil springs and torsion bar springs. Independent suspension system. Introduction to rubber and pneumatic suspension system, Shock Absorbers, Telescopic type shock absorber.

Module-V**(8 HOURS)****Braking System**

Classification of brakes- drum and disc brakes. Theory of braking, mechanical, hydraulic, pneumatic braking system. Master cylinder, tandem master cylinder and wheel power and

power assisted brakes. Servo brake. Power and power assisted brakes-different types of retarders like eddy current and hydraulic retarder. Anti-lock braking systems. Regenerative braking system.

Books:

- [1] K. K. Ramalingam, "Automotive Engineering ". Scitech Publication Pvt Ltd, 2005.
- [2] Kirpal Singh, "Automobile Engineering" vol1 and vol2. Standard Publishers, 2003.
- [3] N.K. Giri, "Automotive Mechanics" Khanna Publishers, New Delhi, 2005
- [4] John Heizler, "Automotive Mechanics", East West Press, 1999.
- [5] Jack E. R. Javee, "Automotive Technology", Thomson Asia Pvt Ltd, 3rd Edition, 2004.

Digital Learning Resources:

NPTEL MOOCs:

Course Name: Fundamentals of Automotive Systems
(Lect-57,58,59,60,63,64)
Course Link: <https://nptel.ac.in/courses/107/106/107106088/>
Course Instructor: Prof. C.S.Shankar Ram, IIT Madras