

Course code	Course Name	L-T-P - Credits	Year of Introduction
AU203	AUTO CHASSIS	3-0-0- 3	2016
Prerequisite: Nil			
Course Objectives <ul style="list-style-type: none"> Study of the Constructional details and Theory of important drive line, Structural, Steering, Braking and Suspension Systems of Automobiles. Problem-Solving ability in Steering Mechanism, Propeller Shaft, Braking and Suspension Systems. 			
Syllabus Chassis layout – vehicle frames- wheels and rims- tyres- drives- drive axles- differential – suspension system-braking systems- front and stub axles – steering mechanism.			
Expected outcome. <ul style="list-style-type: none"> After this course the student must be able to explain the constructional details and the structure of drive line, steering, braking system and suspension system in a vehicle. 			
Text Book: <ol style="list-style-type: none"> Kripal Singh, Automobile Engineering, Standard Publisher, New Delhi , 2006 R.K. Rajput, A Text-Book of Automobile Engineering, Laxmi Publications Private Limited, 2007 N.K. Giri, Automotive Mechanics, Kanna Publishers, 2007 			
References: <ol style="list-style-type: none"> Heldt P.M., Automotive Chassis, Chilton Co., New York, 1990 Newton Steeds and Garret, Motor Vehicles, 13th Edition, Butterworth, London, 2005. Heinz Haisler, Advanced Vehicle Technology, Butterworth, London, 2005. 			
Course Plan			
Module	Contents	Hours	Sem.ExamMarks
I	Types of Chassis layout, with reference to Power Plant location and drive, various types of frames, Loads acting on vehicle frame, Constructional details and materials for frames, Testing of frames. Types and Constructional Details of different Types of Wheels and Rims, different Types of Tyres and their constructional details.	7	15%
II	Effect of Driving Thrust, torque reactions and side thrust, Hotchkiss drive, torque tube drive, radius rods and stabilizers, Propeller Shaft, Universal Joints, Constant Velocity Universal Joints, Front Wheel drive. Final drive, different types, Double reduction and twin speed final drives, Multi-axle vehicles.	7	15%
FIRST INTERNAL EXAMINATION			
III	Construction and Design of Drive Axles, Types of Loads acting on drive axles, Full – Floating, Three-Quarter Floating and Semi-Floating Axles, Axle Housings and Types, Differential principle and types, Differential housings, Non-Slip differential, Differential locks, Final drive of Crawler, Tractors.	7	15%
IV	Need for Suspension System, Types of Suspension Springs, Constructional details and characteristics of Single Leaf, Multi-Leaf, Coil, Torsion bar, Rubber, Pneumatic and Hydro – elastic Suspension Spring Systems, Independent Suspension System, Shock Absorbers, Types and	7	15%

	Constructional details, Design of Leaf Springs.		
SECOND INTERNAL EXAMINATION			
V	Theory of Automobile Braking, Stopping Distance Time and Braking Efficiency, Effect of Weight Transfer during Braking, Theory of Drum Brakes, Leading and Trailing Shoes, Braking Torque, Constructional Details of Drum Brake and its Activators, Disc Brake Theory, Types and Construction, Hydraulic Braking System, Mechanical Braking System, Pneumatic Braking System, Power-Assisted Braking System, Servo Brakes, Retarders, Types and Construction, Anti-Lock Braking	7	20%
VI	Types of Front Axles and Stub Axles, Front Wheel Geometry, viz., Castor, Camber, King Pin Inclination and Toe-in, Condition for True Rolling Motion of Wheels during Steering, Ackerman's and Davis Steering Mechanisms, Steering Error Curve, Steering Linkages, Different Types of Steering Gears, Slip Angle, Over-Steer and Under-Steer, Reversible and Irreversible Steering, Power-Assisted Steering.	7	20%
END SEMESTER EXAM			

Question Paper Pattern

Maximum marks: 100

Time: 3 hours

The question paper shall consist of three parts

Part A

4 questions uniformly covering modules I and II. Each question carries 10 marks
Students will have to answer any three questions out of 4 (3X10 marks =30 marks)

Part B

4 questions uniformly covering modules III and IV. Each question carries 10 marks
Students will have to answer any three questions out of 4 (3X10 marks =30 marks)

Part C

6 questions uniformly covering modules V and VI. Each question carries 10 marks
Students will have to answer any four questions out of 6 (4X10 marks =40 marks)

Note: In all parts, each question can have a maximum of four sub questions, if needed.