

ATC 124 - Automobile Control Systems

(02 credits – 50 marks)

Learning Objectives:

The course should enable students:

1. Understand construction, working and functions of Automobile Systems.
2. Understand construction, working and functions of Automobile control systems such as steering, braking and suspension.
3. Compare the developments in control systems and safety equipment.

Learning Outcomes:

After completion of the course, students are expected to be able to:

1. Identify necessary system requirements of control systems,
2. Compare the developments in control systems and safety equipment

Course Content:

Module –I: Components Selection

04 hrs

Tyre selection, air resistance, rolling resistance, requirement of engine power, transmission system layout

Module –II: Steering systems:

07 hrs

Front axle types, constructional details, front wheel geometry, Condition for True rolling, skidding, steering linkages for conventional & independent suspensions, turning radius, wheel wobble and shimmy, power and power assisted steering

Module –III: Braking system:

06 hrs

Types of brakes, brake-actuating mechanisms, factors affecting brake performance, power & power assisted brakes, Brake system design, Recent developments in transmission & braking system

Module –IV: Suspension systems

07 hrs

Rigid and independent Suspension, Types of Independent suspension system-McPherson strut, wishbone type, Semi-elliptical Leaf spring, coil spring, torsion bar arrangement, Construction and working of Air Suspension System, Construction and working of- Shock absorbers - Telescopic and Gas filled, Anti roll bar or stabilizer bar.

Module –V: Assignments / seminars / case studies on Module -I to Module - IV

05 hrs

References:

1. The Automotive Chassis – Engineering Principle – Jornsens *Reimpell*, Helmut Stoll, Jurgen Betzler, (2001), 2nd Edition ISBN-9780080527734
2. Automotive Chassis – Design & Calculation – P. Lukin, G. Gasparyants, V. Rodionov, MIR Publishing, Moskow (2005)
3. Automotive Chassis – P. M. Heldt, Chilton Co. NK, 2012, ISBN-13:[9781258374150](#), ISBN-13: [9781258386382](#)
4. Mechanics for Road Vehicles – W. Steed, Illiffe Books Ltd., London (1960), ASIN: B0000CKKGV
5. Automotive Mechanics, Crouse, Anglin, Tata McGraw - Hill Career Education ISBN 10: [0028009436](#) ISBN 13: [9780028009438](#)
6. Machine Design, P.Kannaiah, Scitech, (2010) ISBN 10: [8183711510](#) / ISBN 13: [9788183711517](#)
7. Auto design, R. B Gupta, Satya Prakashan, ISBN: 8176840106 ISBN-13: 9788176840101