

Title of the Subject: Vehicular Systems		Sem:6		Code: UAU641N		Credits: 3		PSO								
		1	2	3	1	2	3	1	2	3						
<p style="text-align: center;">Programme Outcomes</p> <p style="text-align: center;">Course Outcomes</p>		Engineering knowledge	Problem analysis:	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage:	The engineer and society:	Environment and sustainability:	Ethics:	Individual and team work	Communication:	Project management and finance:	Life-long learning:	Apply engineering basic knowledge with modern computing tools in solving problems of design, production and servicing domains	Mould and develop engineers to serve in industries as professionals or entrepreneur	Prepare engineers to undertake research and higher learning
1	To classify the different types of automotive layouts and engines and their applications	1	2	1			1						2	3	2	2
2	To classify brakes and steering systems, construction and operational features	1	2	1									2	3	2	2
3	Ability to illustrate construction and working of various transmission systems	2	3	2	1								2	3	2	2
4	To be able to describe construction and working of different types of suspension systems and tyres	1		3	3								2	3	2	2

(All Branches)

OPEN ELECTIVE
UAU641N: VEHICULAR SYSTEMS
3 Credits (L-T-P: 3-0-0)

UNIT – I

10 HOURS

GENERAL: Introduction, electric vehicles, hybrid vehicles, electronics in automobiles; sensors, ECU. Automotive emissions.

VEHICLE LAYOUTS: Introduction, different types of layouts, front engine front wheel drive, front engine rear wheel drive, rear engine rear wheel drive, four-wheel drive, all-wheel drive.

ENGINES: Combustion in SI Engines; ignition limits, stages of combustion, detonation, combustion chambers.

Combustion in CI Engines; stages of combustion, delay period, diesel knock, combustion chambers. Turbo-charging and dual fuel engines.

UNIT – II

10 HOURS

CONTROL SYSTEMS:

BRAKES: classification, hydraulic brakes, mechanical brakes, disc brakes, drum brakes, brake fluids, requirements, bleeding of brakes, air brakes, vacuum servo brakes, parking brakes, trouble shooting diagnosis. ABS and EBD.

STEERING SYSTEMS: Types of steering systems, correct steering angle, cornering force, under steer and over steer. Types of steering gear; rack and pinion, recirculating type etc. Power steering.

UNIT – III

10 HOURS

TRANSMISSION SYSTEMS:

CLUTCH: Purpose, requirements, materials, types of clutches; single plate, multi-plate, diaphragm, centrifugal, semi-centrifugal, vacuum, hydraulic clutch. Trouble shooting diagnosis.

GEAR BOX: Purpose, types of gear box; sliding mesh, constant mesh, synchromesh and epicyclic gear box. Gear box lubrication, gear ox troubles. Automatic transmission; significance and types.

UNIT – IV

10 HOURS

SUSPENSION SYSTEMS:

Purpose, types of springs; coil springs, leaf springs, torsion bar, helper springs, rubber springs. Independent suspension; advantages and types. Shock absorbers. Stabilizer bars. Active suspension. Trouble shooting.

WHEELS AND TYRES: Wheels; types and materials. Tyres; Tubed and tubeless tyres; advantages. Tyre materials, desirable tyre properties, aspect ratio, nomenclature, factors affecting tyre life and tyre rotation.

TOTAL: 40 HOURS

Text books:

1. Automobile Engineering By Kirpal singh Vol. I & II
2. Automobile Engineering By GBS Narang
3. I C Engines, M L Mathur, R P Sharma, Dhanpat Rai Publications
4. Automotive Mechanics, W H Crouse, Anglin, Tata Mcgraw Hil