

GANPAT UNIVERSITY

FACULTY OF U V PATEL COLLEGE OF ENGINEERING

Programme		Degree Engineering			Branch/Spec.	Automobile Engineering			
Semester		IV			Version	1.0.0.0			
Effective from Academic Year			2018-19		Effective for the batch Admitted in			June 2017	
Subject code		2AE403		Subject Name		Automotive Electronics And Instrumentation			
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	1	0	4	Theory	40	60	100
Hours	3	0	2	0	5	Practical	30	20	50
Pre-requisites:									
None									
Learning Outcome:									
Learning Outcomes:									
After completion of this course, student will be able to									
<ul style="list-style-type: none"> On completion of this course, the students will be able to Tell the functions of the electronic components and the way they work.. 									
Theory syllabus									
Unit	Content								Hrs
1	Introduction to microcomputer Microcomputer: Buses, Memory, timing, CPU registers; Microprocessor architecture: Initialization, Operation codes, Program counter, Branch and jump instructions, Subroutine. Analog to digital converters and Digital to analog converters, Sampling, polling and interrupts, Digital filters, Lookup table.								9
2	Sensors and actuators Speed sensors, Pressure sensors: Manifold Absolute Pressure sensor, Knock sensor, Temperature sensors: Coolant and Exhaust gas temperature, Exhaust Oxygen level sensor, Position sensors: Throttle position sensor, Accelerator pedal position sensor and Crankshaft position sensor, Air mass flow sensor. Solenoids, Stepper motors and relays								9
3	Electronic engine management system Electronic engine control: Input, output and control strategies, Electronic fuel control system, Fuel control modes: open loop and closed loop control at various modes, EGR control, Electronic ignition systems –Spark advance correction schemes, Fuel injection timing control.								9
4	Electronic vehicle management system Cruise control system, Antilock braking system, Electronic suspension system, Electronic steering control, Traction control system, Transmission control, Safety: Airbags, Collision avoiding system, Low tire pressure warning system.								9
5	Automotive instrumentation system Input and output signal conversion, Multiplexing, Fuel quantity measurement, Coolant temperature and oil pressure measurement, Display devices-LED, LCD, VFD and CRT, Onboard diagnostics(OBD), OBD-II, off board diagnostic								9
Practical content									
<ul style="list-style-type: none"> The practical work shall be based on experimental and analytical work on the topics mentioned above and will be defended by the candidates. 									
Text Books									
1	Tom Denton, "Automobile Electrical and Electronic Systems" 3rd edition-Edward Arnold, London -2004.								
2	Understanding Automotive Electronics, William B Ribbens, Newne Butterworth-Heinemann, 6 th edition 2003.								
Reference Books									
1	Bechhold "Understanding Automotive Electronics", SAE, 1998								
2	Robert Bosch "Automotive Hand Book", SAE (5th Edition), 2000.								
3	Eric Chowanietz - 'Automotive Electronics' -SAE International USA –1995								