ATGE 326 Autotronics

(02 credits – 50 marks)

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

CO1	Identify various types of display device.
CO2	Carry out the instrumentation in vehicle and intelligent vehicle system.
CO3	Elaborate embedded system application in automotive.
CO4	Demonstrate the working of serial communication using I2C, CAN, USB buses and parallel communication using ISA, PCI.

Module I: Instrumentation application in Vehicles (06 hours)

Analysis of Fuel and Emitted particles CO_2, NOx, Hydro carbons, Modern automotive instrumentation – computerized instrumentation system,multiplexing,sampling and advantages – Measurements – fuel quality, coolant temperature, oil pressure vehicles speed, Display devices – LED, LCD, VFD, CRT and types, CAN network, the glass cockpit andinformation system.

Module II: Embedded application in motor vehicles (05 hours)

Introduction to functional building blocks of embedded systems – Register, memory devices,ports, timer, interrupt controllers using circuit block diagram representation for each categories –Devices & buses for devices network

Module III: Communication Protocols (06 hours)

Serial bus, CAN bus, GPS tracking Systems, serial communication using I2C, CAN, USB buses – parallelcommunication using ISA, PCI - device drivers in a system – Serial port & parallel portMicroprocessor based front panel Indicators Ignition Systems – Engine Controls – RTOS applications.

Module IV: Intelligent Sensors (07 hours)

Sensors for intelligent transport systems,Supplementary Restraint System, wipers, climate control and electronic displays, Sensors for occupant safety, The digital vehicle, Intelligent vehicle systems, Sensors and interfacing techniques for Engine control, adaptive cruise control, braking control, traction control, steering and stability, ABS system, Electronic power steering.

Module -V Tutorials, case studies and presentation based on Module I to IV (06 hours)

References:

1. William B. Ribbens, *Understanding Automotive Electronics*, 5th edition, Newnes
2. Ronald k. Jurgen, *Automotive Electronics Handbook*, 2nd edition, McGraw-Hill
3. Rajkamal, Embedded System – Architecture, Programming, Design", Tata McGraw Hill,2003.
4. Daniel W. Lewis „Fundamentals of Embedded Software", Prentice Hall of India.
5. Holman, J.P., Experimental methods for engineers, McGraw-Hill
6. Raman, C.S., Sharma, G.R., Mani, V.S.V., Instrumentation Devices and Systems, TataMcGraw Hill, New Delhi