

M.E Semester: 2 M.E Mechanical (Automobile Engineering)
Subject Name: Autotronics (Elective- II) MEA206C

A. Course Objective

- To present a problem oriented in depth knowledge of Autotronics
- To address the underlying concepts and methods behind Autotronics

B. Teaching / Examination Scheme

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total Marks
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	
CODE	NAME	Hrs	Hrs	Hrs	Hrs	Hrs	Marks	Marks	Marks	Marks	Marks	
MEA206C	Autotronics	3	0	0	3	3	70	30	20	0	120	

C. Detailed Syllabus

1. Fundamentals of Automotive Electronics: Microprocessor and micro Computer applications in automobiles; components for engine management System; electronic management of chassis system; vehicle motion control; electronic panel meters.
2. Sensors & Actuators: Introduction; Basic sensor arrangement; Types of Sensors such as oxygen sensors, Crank angle position sensors, fuel metering/vehicle speed sensors and detonation sensors, altitude sensors, flow Sensors, throttle position sensors, solenoids, stepper motors, relays.
3. Electronic Fuel Injection & Ignition System: Introduction; feed back carburetor system; throttle body injection and multi point fuel injection System; injection system controls; advantage of electronic ignition systems; types of solid state system and their principle of operation; electronic spark timing.
4. Digital Engine Control System: Open loop and closed loop control system; engine cooling and warm-up control; acceleration, deceleration and idle speed control; integrated engine control system; exhaust emission control engineering; on-board diagnostics; future automotive electronic systems.
5. Automotive Electrical: Batteries; starter motor & drive mechanism; D.C. generator and alternator; regulation for charging; lighting design; dashboard instruments; horn, warning system and safety devices.

6. Comfort & Safety: Seats, mirrors and sun roofs; central locking and electronic Windows; cruise control; in-car multimedia; security; airbag and belt tensioners; other safety and comfort systems; new developments.
7. The system approach to control & instrumentation: Fundamentals, electronic components and circuits, digital electronics, microcomputer instrumentation and control, sensors and actuators, digital engine control systems, vehicle motion control, automotive instrumentation and telematics, new developments.
8. Electromagnetic Interference Suppression: Electromagnetic compatibility Electronic dash board instruments - Onboard diagnosis system. Security and warning system..

D. Lesson Planning

<u>SR.NO</u>	<u>DATE/WEEK</u>	<u>UNIT NO</u>	<u>%WEITAGE</u>	<u>TOPIC NO</u>
1	1 ST , 2 ND , 3 RD	1	20	1
2	4 TH , 5 TH , 6 TH	2	20	2,3
3	7 TH , 8 TH , 9 TH	3	20	4
4	10 TH , 11 TH , 12 TH	4	20	5,6
5	13 TH , 14 TH , 15 TH	5	20	7,8

E. Instructional Method & Pedagogy

- At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal weightage should be given to all topics while teaching and conduction of all examinations.
- Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
- One/Two internal exams may be conducted and total/average/best of the same may be converted to equivalent of 30 marks as a part of internal theory evaluation.
- Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
- Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overall internal evaluation.

F. Students Learning Outcomes

- The student can identify different areas of Autotronics.

- Can find the applications of all the areas in day to day life.

G. Recommended Study Materials

- **Text & Reference Books:**

1. Automotive Electronics Handbook, Ronald K. Jurgen, McGraw Hill Publishing Co., ISBN 0-07-034453-1.
2. Automotive Electricity and Electronics, Al Santini, Delmar Publishers, NY, ISBN 0-8273-6743-0.
3. Automobile Electrical & Electronic Equipments, Young, Griffiths, Butterworth Publication, London.
4. Understanding Automotive Electronics, Bechfold, SAE 1998

