

Course unit title:	Electronic Management Systems		
Course unit code:	AU206		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (1 st Cycle)		
Year of study:	2		
Semester when the unit is delivered:	4 (Spring)		
Number of ECTS credits allocated :	5		
Name of lecturer(s):	Mr. Julios Vasiliou		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> 1. Analysis of fuel emissions, their causes and how they can be reduced. Explanation of the need fuel economy and emission reduction. 2. Detailed analysis of the effect of various control features on emissions and performance. Explanation of the catalytic converter efficiency and exhaust gas recirculation valves 3. Introduction to the principle of engine mapping and analysis of the parameters needed to write a base map and how to smooth it. 4. Analysis of the frequency and deviation of the fuel controller and detailed analysis of the function of the oxygen sensor. Explanation of open and closed loop systems and the conditions needed for each loop. 5. Detailed explanation of the function and characteristics of various sensors and actuators associated with fuel control strategy 6. Analysis of mechanical, transistorised and electronic ignition systems (Hall generator, induction type, pulse generator, semiconductor ignition, Knock control, distributor-less semiconductor ignition) 		
Mode of delivery:	Face-to-face		
Prerequisites:	AU203	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	<ul style="list-style-type: none"> ● Introduction to the Vehicle electronic engine control <ul style="list-style-type: none"> - Emissions and Fuel economy - Engine Mapping - Effect of various control features on performance ● Electronic control Strategy of Fuel System <ul style="list-style-type: none"> - Catalytic Converters and Oxygen sensor - Frequency and deviation of the fuel controller - Open and close loop control ● Electronic control Strategy of Ignition System <ul style="list-style-type: none"> - Electronic, mechanical and transistorized ignition (Hall generator, induction type, pulse generator, semiconductor ignition, Knock control, distributor-less semiconductor ignition) - Open and closed loop control - Spark plugs ● Various sensors and actuators <ul style="list-style-type: none"> - Fuel control sensors and actuators operation - Ignition timing control sensors and actuators operation 		

	<ul style="list-style-type: none"> ● Laboratory Work: <ul style="list-style-type: none"> - Experiment 1: Transient and Steady State Emission Analysis Petrol engines - Experiment 2: Transient and Steady State Emission Analysis Diesel engines - Experiment 3: Lambda probe - Experiment 4: Engine Temperature Sensor - Experiment 5: Engine rpm and phase sensor - Experiment 6: knock sensor - Experiment 7: Throttle valve transducer and idle switch - Experiment 8: Injector - Experiment 9: Absolute pressure sensor - Experiment 10: Ignition in Otto Cycle engine (Electronic Ignition) - Experiment 11: Electronic Engine Operation (start and warming –up phase) - Experiment 12: Electronic Engine Operation (Acceleration, deceleration, cut-off and knock phase)
Recommended and/or required reading:	
Textbooks:	<ul style="list-style-type: none"> ● Robert Bosch GmbH, “Automotive Electrics Automotive Electronics”, 5th edition, 2007 ● William B. Ribbens ,”Understanding Automotive Electronics”, 6th Edition, Newnes, 2003
References:	<ul style="list-style-type: none"> ● Tom Denton, “Automobile Electrical and Electronic Systems”, 3rd Edition, Society of Automotive Engineers, 2007. ● Jurgen Ronald, “ Automotive Electronics Handbook”, McGraw-Hill, 1999 ● Bauer Horst, “Automotive Electrics and Electronics”, Robert Bosch, 1999 ● “Automotive Electrical and Electronic Systems Manual”, Haynes, 1995
Planned learning activities and teaching methods:	<p>The course is taught in class with the aid of computer presentations. Details lecture notes and presentations as well as any other relevant supporting material (graphs, figures, etc.) are available through the lecturer’s website for the students to use in conjunction with the textbooks.</p> <p>Laboratories are carried in the vehicle systems and ICE Laboratories, in small groups, in order for the students to develop understating of the taught material.</p>
Assessment methods and criteria:	<ul style="list-style-type: none"> ● Assignments 12.5% ● Tests 25% ● Laboratory Work 12.5% ● Final Exam 50%
Language of instruction:	English
Work placement(s):	No