

Course unit title:	Vehicle's Technology		
Course unit code:	AU110		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (1 st Cycle)		
Year of study:	1		
Semester when the unit is delivered:	1 (Fall)		
Number of ECTS credits allocated :	5		
Name of lecturer(s):	Mr. Julios Vasiliou, Mr. Marios Sevastides		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> 1. Identify of the types and categories of vehicle today in the global market. Describe how each type of vehicle is adapted to each application and market segment. Analyse the way vehicles' body is constructed and designed and list raw materials used. Analyse in some techniques of manufacture. 2. Identify the cost of vehicle usage like air pollution, noise pollution and clearly explain the need for reducing energy consumption and best allocation of scarce resources available in the world. Also list possible alternative energy resources that are potential clients for future vehicles. 3. Explain the function of 4- stroke, 2 stroke and Wankel engines. Distinguish between diesel and petrol fuels; that is the compression ratios, internal components, construction, materials and assembly 4. Explain the function of manual transmission systems and analyse the various gear ratios. Also list some types of gears and materials used. More to that construction and assembly of manual transmission units will be analysed. 5. Explain the function of Automatic transmission units. More to that construction and assembly of automatic transmission units will be analysed giving emphasis on the control strategy of the system. Explain the function of Differential and shafts. Design, materials used, construction techniques and assembly will be explained. 6. Analyse the types of suspension systems, major component used and in the vehicle geometry. The types of steering systems will be analysed and the types of power steering will be explained (hydraulic – electric). Types of tyres and tyre coding will be explained and tyre wear condition will be analysed. 7. Explain the types of braking systems and how they function. Causes and effect of the stopping distance will be analysed. Finally future trends will be discussed (reference to x-by-wire systems). Analysis of major components – master cylinder, servo assisted systems, disc brakes, drum brakes, ABS systems and traction control systems 8. Analyse the SRS systems which will include the types of airbags and seat belt pre-tensioners and their function. 9. Development of skills in engine and transmission system maintenance, repair and rebuild. 		
Mode of delivery:	Face-to-face		
Prerequisites:	None	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	<ul style="list-style-type: none"> ● General Introduction 		

	<ul style="list-style-type: none"> ● Role of vehicles in transportation ● Relation with environment: air pollution, noise, energy consumption and recycling, end-of-life directive ● Vehicle types/market segments: body types, construction types, part identification, assembly techniques, homologation and market, materials ● Vehicle components: car body and major drivetrain locations, engines and cycles, internal engine parts and subsystems (cooling, lubrication, etc.), shafts, clutches, manual and automatic gearboxes, differentials suspension and steering systems, braking system, tires. ● Safety features: Airbags, seatbelts, pretensioners, loadlimiters, crumplezones ● Laboratory Work <ul style="list-style-type: none"> ● Transmission units: Manual transmission unit disassembly carrying out testing and replacement of bearings, synchronizers and gears. Students should be able to calculate the Gear ratio. Clutch system replacement with centring of clutch system and bleeding of hydraulic clutch. Automatic transmission unit disassembly. Transfer box and differential disassembly and inspection of gear arrangement and final drive ratios. ● Internal Combustion Engines: Analysis of main features and controls of internal combustion engines, including cooling system, lubrication system, valve train, crankshaft mechanism, etc. Disassembly and rebuilt of an engine with various measurements and calculations taken out of the internal components.. ● Visit to workshops of industry: Visit to modern workshops of local industry to observe and gain knowledge of facilities and work environment.
Recommended and/or required reading:	
Textbooks:	M.J. Nunney , Automotive Technology , SAE International, 3 rd Edition, 1998
References:	Julian Happian Smith, Introduction to Modern Vehicle Design , SAE International, 2002 Paul Nieuwenhuis, Peter Wells, Motor Vehicles in the Environment: Principles and Practice , John Wiley & Sons, 1994.
Planned learning activities and teaching methods:	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. A laboratories are carried in small students groups (10-15 students), in order for the students to develop understating of the taught material.
Assessment methods and criteria:	<ul style="list-style-type: none"> ● Laboratory Assessment 25% ● Tests 25% ● Final Exam 50%
Language of instruction:	English
Work placement(s):	No