Course unit title:	Vehicle Engineering Design		
Course unit code:	AU405		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (2nd Cycle)		
Year of study:	4		
Semester when the unit is delivered:	8 (Spring)		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	TBA, c/o Dr Antonios Lontos, Dr.-Ing. Loucas Papadakis		
Learning outcomes of the course unit:	1. Analyse the functional, working, conceptual and system interrelationship for a vehicle system 2. Analyse the process of conceptual design for a vehicle system 3. Evaluate the functional, working, conceptual and system interrelationship for a vehicle system 4. Analyse the logical, physical and constructive operations for vehicle design purposes 5. Formulate the process of embodiment design for a vehicle systems 6. Integrate the principles of detail design for the design of vehicle systems 7. Optimize a vehicle system using parameter optimization methods		
Mode of delivery:	Face-to-face		
Prerequisites:	AUTO 309	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	• **Fundamentals of Engineering Design in vehicles** Energy, material and signal transformation, Functional, working, conceptual and system interrelationship, Logical, physical and constructive operations, case study • **Fundamentals of a Systematic Approach in vehicles** General working method, General problem solving, Abstracting to identify functions, Search for solution principles, Evaluation of functions, case study • **The Design Process in vehicles** Defining requirements, Conceptual Design, Embodiment Design, Detail Design, case study • **Principles of Embodiment Design** Basic rules of Embodiment Design, Principles of Embodiment Design, Guidelines of Embodiment Design, case study • **Design Analysis and Optimization Methods** Finite Element Analysis, Parameter Optimization Mehtods, case study		
Recommended and/or required reading:	None		
Textbooks:	• Engineering Design, Rudolph J. Eggert, Prentice Hall, 2005 • Introduction to Modern Vehicle Design, Julian Happian Smith, SAE		

	International, 2002 •
References:	• Engineering Design: A systematic approach, Pahl, Beitz, 2nd Edition, 1999 • Engineering Design, A Materials and Processing Approach, G. E. Dieter, McGraw–Hill International Editions, 3rd Edition, 2000 • Automotive Handbook, Robert Bosch GmbH, 2007 • Chassis Design: Principles and Analysis, William F. Milliken, et al, Society of Automotive Engineers, 2002. • Finite Element Analysis Theory and Application with ANSYS, Saeed Moaevni, Prentice Hall 2007 • Handbook of Automotive Body and Systems Design, John Fenton, professional Engineering Publishing,1998 • Materials for Automotive Bodies, Geoffrey Davies, Elsevier, 2012 • The Automotive Body Manufacturing Systems and Processes, M. A. Omar, Wiley 2011
Planned learning activities and teaching methods:	• Lectures and lecture-based problem classes for exam preparations. • Assignments for learning how to obtain and present relevant information • Laboratory sessions with aim to get acquainted with lab equipment and instruments for measuring purposes • Knowledge checking: One midterm examination, assignment with report and final examination.
Assessment methods and criteria:	• Test: 20% • Project: 20% • Final Exam: 60%
Language of instruction:	English
Work placement(s):	No