a) General			
School	ENGINEERING		
Academic unit	MECHANICAL ENGINEERING		
Level of studies	Undergraduate		
Course code	MM208E02	*Semester*	8
Course title	**Computer Aided Engineering (CAE)**		

Independent teaching activities	*Weekly teaching hours*	*ECTS*
Lectures	2	4.0
Laboratory exercises	2	

Course type	Knowledge deepening/consolidation
Course category	Compulsory Elective for Direction 2
Prerequisite courses	-
Language of instruction and examinations	Greek
Is the course offered to Erasmus students	Yes
Course website (url)	https://moodle.uniwa.gr/course/view.php?id=1245

b) Learning outcomes and general competences

b1. Learning outcomes

Upon successful completion of this course, the student will be able to:

- understand computational analysis of mechanical structures using analytical methods and the Finite Elements Method
- understand the fundamental operating principles of modern Computer Aided Engineering Systems
- identify and correctly appliy the constraints and loading conditions of the problem
- select the meshing technique for the simulation study
- Analyze and evaluate in-depth the calculation results
- understand the capabilities and range of information offered by modern engineering software using the finite data method

b2. General competences

- Search for analysis and synthesis of data and information with the use of the necessary technology
- Adapting to new situations
- Decision-making
- Working independently
- Team work
- Working in an international environment
- Working in an interdisciplinary environment
- Production of new research ideas
- Respect for the natural environment
- Production of free, creative and inductive thinking

c) Syllabus

Theoretical background of the Finite Elements Method. Engineering problems applications and the potential offered by the FEM method. Study of mechanical parts and assemblies strength problems under static loading. Eigenfrequency analysis of mechanical components for the control and avoidance of vibration. Buckling. Drop test analysis. Thermal stress analysis. Study of heat transmission problems to mechanical and electronic components. Laboratory exercises in CAE

<table>
<tr><td colspan="3">system.</td></tr>
<tr><td colspan="3">d) Teaching and learning methods - Evaluation</td></tr>
<tr><td>Delivery</td><td colspan="2">Face-to-face, Distance learning</td></tr>
<tr><td>Use of information and communications technology</td><td colspan="2">- Commercial/free/open source software
- Multimedia applications
- MS Teams/Moodle/eclass
- Open courses</td></tr>
<tr><td rowspan="7">Teaching methods</td><td>Activity</td><td>Semester workload</td></tr>
<tr><td>Lectures</td><td>26</td></tr>
<tr><td>Tutorials</td><td></td></tr>
<tr><td>Laboratory exercises</td><td>26</td></tr>
<tr><td>Computational exercises</td><td></td></tr>
<tr><td>Individual work</td><td>78</td></tr>
<tr><td>Course total</td><td>130</td></tr>
<tr><td>Student performance evaluation</td><td colspan="2">Theoretical part: Final Exam
Laboratory assessment: Final exam based on laboratory exercises / Optional Assessment on individual and group-based industrial case-studies. Results discussion and in-class presentation.</td></tr>
<tr><td colspan="3">e) Suggested bibliography</td></tr>
<tr><td colspan="3">1. Προβατίδης, Χ. (2017). Πεπερασμένα Στοιχεία στην Ανάλυση Μηχανολογικών Κατασκευών. Εκδόσεις Τζιόλα
2. Adams, V., Askenazi, A. Building better Products with Finite Element Analysis. Onward Press
3. Schäfer, Michael. Computational Engineering - Introduction to Numerical Methods. Springer
4. Kuang-Hua Chang (2014). Product Design Modeling using CAD/CAE. Academic Press
5. Συναφή επιστημονικά περιοδικά: Integrated Computer-Aided Engineering. IOS Press</td></tr>
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