MECHANICAL DESIGN I

COURSE OUTLINE

Responsible: Markos Petousis

1. GENERAL			
SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Mechanical Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	0813.7.001.0	**SEMESTER**	1st
COURSE TITLE	Mechanical Design I		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course	**WEEKLY TEACHING HOURS**	**CREDITS**
	0	5
Total	**0**	**5**

COURSE TYPE general background, special background, specialised general knowledge, skills development	
PREREQUISITE COURSES	3d CAD Machine Elements Mechanical drawing
LANGUAGE OF INSTRUCTION and EXAMINATIONS	English
OFFERED TO ERASMUS STUDENTS	Yes (in English) — Winter Semester
COURSE WEBSITE (URL)	

2. LEARNING OUTCOMES

Learning outcomes

"Mechanical Design I" aims to integrate basic mechanical engineering knowledge for the processing of technical problems related with the products design.

Basic mechanical engineering knowledge, such as mechanical drawings, materials technology, mechanics, materials strength, machine elements and manufacturing technologies, are combined in an applied level for the design and development of a new or the redesign of an existing mechanical product. Understanding the industrial design stages (from the conceptual design, to the process of the idea and the evaluation of the prototype) is achieved from the students with the implementation of a mechanical design project through decision making processes.

General Competences

The student who has successfully completed the Mechanical Design I class, will have the ability to:

- Analyze a technical problem related to the design of a mechanical product
- Seek ideas that lead to the solution of a technical problem
- Select the optimum solution and covert it to a mechanical setup
- Implement full design of the mechanical setup
- Manufacture a prototype model for the mechanical setup
- Present the developed solution of the technical problem studied

For the project implementation students employ advanced products design, analysis and prototype manufacturing methods, such as CAD/CAM/CAE software tools and 3d printers.

3. SYLLABUS

1. The mechanical design process
2. Technical problems formulation and analysis
3. Collection and processing of information
4. Specifications list
5. Conceptual Design
6. Synthesis and evaluation of technical solutions
7. Development and design of a technical solution
    - Materials, parts, standardization
    - Loads, construction analysis
    - Kinematics, mechanisms
    - Safety
    - Manufacturing and production
    - Assembly
    - Maintenance, reliability
    - Aesthetics, ergonomics
    - Billing
    - Innovation
    - Design optimization
8. Production systems and processes selection
9. Organizing and administration of working groups
10. Mechanical design software tools in the computer

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	Project
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	
TEACHING METHODS The manner and methods of teaching are described in detail.	**Activity** | **Semester workload** **Course total** |
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure	

5. ATTACHED BIBLIOGRAPHY