

COURSE OUTLINE

1. GENERAL INFORMATION

SCHOOL	MARITIME AND INDUSTRIAL STUDIES		
DEPARTMENT	INDUSTRIAL MANAGEMENT AND TECHNOLOGY		
LEVEL OF STUDY	UNDERGRADUATE		
COURSE UNIT CODE	TEΠΛΗ67-1	SEMESTER OF STUDY	7 th
COURSE TITLE	COMPUTER-AIDED PRODUCT DESIGN		
INDEPENDENT TEACHING ACTIVITIES <i>in case in which credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures, Lab, Project			5.5
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at section 4.</i>			
COURSE TYPE <i>general background, special background, specialized general knowledge, skills development</i>	Special background		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATION/ASSESSMENT:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://eclass.unipi.gr/courses/BDT144/		

2. LEARNING OUTCOMES

<p>LEARNING OUTCOMES</p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:</i></p> <p>APPENDIX A</p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications' cycle, according to the European Higher Education Area's Qualification Framework.</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and APPENDIX B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>The course introduces students to the design of products/assemblies/machines and to modern design concepts such as Design for manufacturing & Assembly. The importance of design and the connection to modern automated production methods are also presented. Following the theoretical introduction to product design, elements of technical/engineering drawing and basic functions of CAD (Computer Aided Design) software are briefly presented. Modern techniques and tools for the geometric data representation and processing that are employed in modern CAD software are, also, presented in detail. Besides the theoretical analysis, students are systematically trained in product design using industry-leading mechanical CAD packages such as Pro-Engineer software. The course presents to students the potential of modern CAD tools and trains them to their use so that they would be able as future executives of industrial enterprises to perform bid evaluations, select the appropriate hardware/software for CAD/CAE, efficiently incorporate CAD/CAE systems in industrial operation etc.</p> <p>Upon successful completion of the course students will be able to:</p> <ul style="list-style-type: none"> • Demonstrate knowledge on the capabilities of modern CAD tools

- Use modern CAD tools so that, as f as future executives of industrial enterprises, they can participate in tender evaluation, in selection of corresponding products, drafting specifications for CAD software supplies, etc.
- Demonstrate knowledge on the engineering processes and techniques and the ways in which they are linked to production
- Demonstrate knowledge on the basic mathematical background of industrial design and product analysis technologies
- Demonstrate knowledge on production planning methodologies (DFM-DFA)
- Demonstrate knowledge on the nature and codes of the engineering plan

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aims

Search for, analysis and synthesis of data and information, by the use of technologies that are necessary according the case

Adapting to new situations

Decision-making

Independent work

Team work

Working in an international environment

Working in an interdisciplinary environment

Introduction of innovative research

Project planning and management

Respect for difference and multiculturalism

Environmental awareness

Social, professional and ethical responsibility and sensitivity to gender issues

Critical consciousness, criticism and self-criticism

Development of free, creative and inductive thinking

- Search for, analysis and synthesis of data and information, by the use of technologies that are necessary according the case
- Adapting to new situations
- Decision-making
- Independent work
- Team work
- Introduction of innovative research
- Respect for difference and multiculturalism
- Social, professional and ethical responsibility and sensitivity to gender issues
- Development of free, creative and inductive thinking

2. COURSE CONTENT

The course covers the following topics:

Week	Topic
1	Introduction to CAD/CAM/CAE
2	Industrial Products Design and CAD/CAE
3	Basic elements of CAD
4	3D CAD Modeling Lab
5	Technical Drawing basics
6	Geometric Modeling Techniques
7	3D CAD Modeling Lab
8	Basic Computer Graphics for CAD
9	Curves and Surfaces
10	Design for Manufacturing
11	Design for Assembly
12	Automation
13	3D CAD Modeling Lab

Also, students participate in individual or team work, as well as in laboratory classes, at the of Laboratory of Advanced Manufacturing Techniques & Testing. Commercial software CAD packages, such as Pro Engineer and CATIA, are used. Students are trained in workshops with a rotation system. The workshop program is posted on the course website and at eclass at the beginning of the semester.

In addition, articles, audiovisual lecture material, web addresses, useful information and exercises are posted at eclass.

3. TEACHING METHODS - ASSESSMENT

<p>TEACHING MODE <i>Face-to-face, in-class lecturing, on distance teaching and distance learning etc.</i></p>	In-class lecturing / Laboratory teaching	
<p>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY <i>Use of ICT in Teaching, Laboratory Education, Communication with students</i></p>	<p>Teaching: Lectures with audiovisual media, support of the learning process through the eclass platform Laboratory Education: Use of commercial CAD software, such as Pro Engineer and CATIA Communication with students: face-to-face at office hours, email, eclass</p>	
<p>COURSE DESIGN <i>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, clinical practice, Art Workshop, Interactive teaching, Educational visits, project, Essay writing, Artistic creativity, etc.</i></p> <p><i>The study hours for each learning activity as well as the hours of non- directed study are given according to the principles of the ECTS</i></p>	<p>Activity / Method</p>	<p>Semester Workload</p>
	Lectures	52
	Laboratory	12
	Project	30
	Self-study of lecture material and exercises	41
	Counselling	0.5
	Exams (written)	2
Course Total	137.5	
<p>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS <i>Detailed description of the evaluation procedures: Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice questionnaires, short- answer questions, open-ended questions, problem solving, written work, Essay/report, oral exam, public presentation, laboratory work, art interpretation, other.....etc</i></p> <p><i>Evaluation criteria are specifically defined and given as well as if and where they are reported and accessible to students.</i></p>	<p>Language of exams: Greek</p> <p>Assessment Methods: After the last lecture, the exam material is posted at eclass. The final course grade is formed by the participation of students in lab activities (30%) and by the written exams (70%) taken in the examination period of the winter semester and, in case of failure, in the September resits.</p> <p>The written examination includes problem solving/exercises. It is conducted with closed books.</p> <p>The evaluation of students with special learning difficulties in writing and reading (as certified and qualified by a competent institution) is performed according to the relevant procedure decided by the Department Assembly.</p> <p>Notification of the Assessment Criteria: The evaluation criteria are made known during the first lecture and are clearly stated on the course website and e-class. The answers to the exam questions are posted at eclass after the exam date. Students have the opportunity to discuss their exam paper with the course instructor (at the posted office hours) after the announcement of the course grades.</p>	

4. SUGGESTED BIBLIOGRAPHY

-Suggested Bibliography :

- Book [320304]: CAD Systems, Dedoussis V., Giannatsis I., Canellidis V., <http://hdl.handle.net/11419/4500>
- Book [41955474]: CAD/CAM Systems and 3D Modeling [in Greek], Bilalis N.A., Maravelakis E.
- Book [13624]: Basic principles of CAD/CAM/CAE Systems, Kunwoo Lee

-Scientific Journals:

- Computer-Aided Design
- International Journal of Advanced Manufacturing Technology

Robotics and Computer-Integrated Manufacturing

-Lecture Notes