COURSE OUTLINE

1. GENERAL INFORMATION

SCHOOL	MARITIME AND INDUSTRIAL STUDIES		
DEPARTMENT	INDUSTRIAL MANAGEMENT AND TECHNOLOGY		
LEVEL OF STUDY	UNDERGRADUATE		
COURSE UNIT CODE	ΤΕΠΛΗ67-1	**SEMESTER OF STUDY**	7th
COURSE TITLE	COMPUTER-AIDED PRODUCT DESIGN		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures, Lab, Project		5.5
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at section 4.		

COURSE TYPE *general background, special background, specialized general knowledge, skills development*	Special background
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATION/ASSESSMENT:	Greek (English in ERASMUS)
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.unipi.gr/courses/BDT144 /

2. LEARNING OUTCOMES

LEARNING OUTCOMES

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:

APPENDIX A

- *Description of the level of learning outcomes for each qualifications' cycle, according to the European Higher Education Area's Qualification Framework.*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and APPENDIX B*
- *Guidelines for writing Learning Outcomes*

The course introduces students to the design of products/assemblies/machines, focusing especially on the relationship between product design and production processes. In this context, the Design for Manufacturing & Assembly (DFM&A) methodology is discussed, as well as design aspects of automated and digital manufacturing processes. Basic elements of technical/engineering drawing and geometric data representation/processing techniques are, also, presented. For a more complete presentation of the above topics, design laboratory lectures are held using modern Computer-aided Design (CAD) software/applications.

Upon successful completion of the course students will be able to:

- Demonstrate knowledge on the product design processes and techniques,
- Demonstrate knowledge on the basic mathematical background required for industrial product design and analysis,
- Demonstrate knowledge on product design methodologies focused on production (DFM&A),

- Demonstrate knowledge on the features and codes of the technical drawing,
- Demonstrate knowledge on the capabilities and features of modern CAD software/tools.

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

3. COURSE CONTENT

The course covers the following topics:

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

Besides theoretical lectures, students participate in laboratory classes, in order to gain a better understanding of the theoretical aspects and practical experience in the use of modern CAD software. The laboratory exercises' program is posted on the eclass course website at the beginning of the semester. In addition, articles, audiovisual lecture material, web links/sources, useful information and exercises are posted at eclass.

4. TEACHING METHODS - ASSESSMENT

TEACHING MODE *Face-to-face, in-class lecturing, on distance teaching and distance learning etc.*	In-class lecturing / Laboratory teaching

<table>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY
Use of ICT in Teaching, Laboratory Education, Communication with students</td><td>Teaching: Lectures with audiovisual media, support of the learning process through the eclass platform
Laboratory Education: Use of free/student versions of commercial CAD software
Communication with students: face-to-face at office hours, email, eclass</td></tr>
<tr><td>COURSE DESIGN
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.

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</td><td><table><tr><th>Activity / Method</th><th>Semester Workload</th></tr><tr><td>Lectures</td><td>52</td></tr><tr><td>Laboratory</td><td>10</td></tr><tr><td>Self-study of lecture material and exercises</td><td>73</td></tr><tr><td>Counselling</td><td>0.5</td></tr><tr><td>Exams (written)</td><td>2</td></tr><tr><td>Course Total</td><td>137.5</td></tr></table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS
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

Evaluation criteria are specifically defined and given as well as if and where they are reported and accessible to students.</td><td>Language of exams: Greek (English in ERASMUS)

Assessment Methods: After the last lecture, the exam material is posted at eclass. The final course grade corresponds directly/entirely (100%) to the written exams' grade. The written examination includes theoretical questions and exercises, and is conducted with closed books. If students choose to participate in the laboratory exam, the final course grade forms by the written exams (70%) and the laboratory exam (30%). The same apply, in case of failure, for the September resits.

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.

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.</td></tr>
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5. SUGGESTED BIBLIOGRAPHY

-Suggested Bibliography :

- Book [320304]: CAD Systems [in Greek], 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

- Lecture presentations and support material on eclass