COURSE OUTLINE

(1) OVERVIEW

SCHOOL	MARITIME & INDUSTRY		
DEPARTMENT	INDUSTRIAL MANAGEMENT & TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΤΕΠΛΗ67-1	SEMESTER	7
COURSE TITLE	COMPUTER-AIDED PRODUCT DESIGN		

DISCRETE TEACHING ACTIVITIES *In cases where ECTS credits are awarded to distinct components of the course (e.g., Lectures, Laboratory Exercises, etc.), please indicate them separately. If the credits are awarded as a whole for the entire course, please state the weekly teaching hours and the total number of credits*	WEEKLY TEACHING HOURS	ECTS
Lectures	4	5.5
Please add additional rows if needed. A detailed description of the teaching organization and instructional methods is provided in Section (4).		

COURSE TYPE *core (C), core elective (CE), elective (E) - background, specialization, skill development*	CE - Specialization
PREREQUISITE COURSES:	None.
LANGUAGE OF TEACHING AND EXAMINATIONS:	Greek (English for ERASMUS students)
THIS COURSE IS AVAILABLE TO ERASMUS STUDENTS	Yes
COURSE WEBPAGE (URL)	

(2) LEARNING OUTCOMES

Learning Outcomes

The learning outcomes of the course are described, specifying the particular knowledge, skills, and competencies at the appropriate level that students will acquire upon successful completion of the course.

Please refer to Appendix A

- *Description of the Level of Learning Outcomes for each study cycle according to the Qualifications Framework of the European Higher Education Area.*
- *Descriptive Indicators of Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B.*
- *Concise Guide 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, the 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 account the general competences that a graduate should have acquired (as listed in the Diploma Supplement and outlined below), which of these competences does the course aim to develop?

Searching, analyzing, and synthesizing data and information, using the necessary technologies
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Project design and management
Respect for diversity and multiculturalism
Respect for the natural environment
Demonstration of social, professional, and ethical responsibility and sensitivity to gender issues
Exercising critical and self-critical thinking

Working in an international environment *Working in an interdisciplinary environment* *Generation of new research ideas*	*Promotion of free, creative, and inductive thinking* *…* *Other competences: …*

- Searching, analyzing, and synthesizing data and information, using the necessary technologies
- Adaptation to new situations
- Decision making
- Autonomous work
- Teamwork
- Generation of new research ideas
- Respect for diversity and multiculturalism
- Demonstration of social, professional, and ethical responsibility and sensitivity to gender issues
- Exercising critical and self-critical thinking
- Promotion of free, creative, and inductive thinking

(3) COURSE CONTENT

The course covers the following topics:

Week	Topics
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

In addition to the theoretical lectures, students participate in laboratory classes at the Laboratory of Advanced Manufacturing Technologies & Testing, aimed at familiarizing them with the practical aspects and CAD design tools. The laboratory schedule is posted on the course website and on eclass at the beginning of the semester. Furthermore, articles, audiovisual lecture material, web links to useful resources, exercises, and software are uploaded in electronic format on the eClass platform.

(4) TEACHING and LEARNING METHODS - ASSESSMENT

TEACHING MODE *Face-to-face, in-class lecturing, distance teaching and distance learning etc.*	• Face-to-face in a classroom or the Lab • Distance teaching & learning (if required)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in Teaching, Laboratory Education, Communication with students*	**Teaching**: Lectures using modern audiovisual equipment, learning support through the eClass electronic platform, synchronous distance teaching via MS Teams. **Laboratory**: use of free/student versions of commercial CAD software **Communication with students**: face-to-face during office hours, email, eClass platform, MS Teams tools
Organization of Teaching *A detailed description of the teaching methods and approach is provided.*	

Activity	Semester Workload
Lectures	52
Laboratory	10

Lectures, seminars, laboratory exercises, fieldwork, study and analysis of literature, tutorials, internships (placements), clinical practice, artistic workshops, interactive teaching, educational visits, project work, writing assignments, artistic creation, etc. *The student's study hours for each learning activity, as well as the hours of independent study, are specified in accordance with the principles of ECTS*		Study of bibliography	20
		Self-study of lecture material and exercises	52
		Consultation Support	0.5
		Laboratory exams (written)	1
		Exams (written)	2
		Course Total	**137.5**
STUDENT ASSESSMENT *Description of the assessment process* *Language of assessment, assessment methods, formative or summative evaluation, multiple-choice tests, short-answer questions, essay questions, problem-solving, written assignments, reports, oral examinations, public presentations, laboratory work, clinical patient examination, artistic interpretation, other(s)* *Explicitly state assessment criteria and information on whether and where these criteria are accessible to students are included.*			

Language of Assessment: Greek (English for ERASMUS students)

Assessment Mode: Face-to-face and/or distance learning (if required)

Assessment Methods: The final course grade is formed as follows:

- 70% by written in the examination period of the fall semester and, in case of failure, in the September resits
- 30% by the Laboratory exams (written exam)

The written exam includes problem-solving exercises, short-answer and essay questions. It is conducted closed-book.

Students with Learning Difficulties: Students with certified learning difficulties in reading and writing (as recognized by the competent authority) are assessed according to the procedures established by the Department.

Disclosure of Assessment Criteria: The assessment criteria are communicated during the first class and are clearly stated on the course website and the eClass platform. The exam syllabus is announced on eClass following the final lecture of the semester. The exam answers are posted on eClass after the examinations take place. Students have the right to review their graded exams and receive explanations regarding their grades. In cases of further requests, the procedures outlined in the current Study Regulations apply.

(5) SUGGESTED BIBLIOGRAPHY

- Books:

- Dedoussis, V., Giannatsis, J., Kanellidis, V. (2016). CAD Systems, Kallipos Publications (open source), ISBN: 9789606034602 [320304] – in Greek

- Journals:

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

Robotics and Computer-Integrated Manufacturing

- Other educational material:

- Lecture Notes and Supporting Material provided by the Instructor
- Laboratory Workbook