COURSE OUTLINE

1. GENERAL INFORMATION

SCHOOL	MARITIME AND INDUSTRIAL STUDIES
DEPARTMENT	INDUSTRIAL MANAGEMENT AND TECHNOLOGY
LEVEL OF STUDY	UNDERGRADUATE
COURSE UNIT CODE	ΤΕΠΛΗ68-1 **SEMESTER OF STUDY** 8th
COURSE TITLE	COMPUTER-AIDED PRODUCT MANUFACTURING

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		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
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://eclass.unipi.gr/courses/BDT192 /

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*

In the context of the present course, the student is introduced to the Computer-Aided Manufacturing (CAM) tools and techniques for the discrete manufacturing sector. The first section of the course is dedicated to the presentation of basic manufacturing processes, emphasizing the family of cutting processes and machining. The introductory section is followed by a presentation of the Computer Numerical Control (CNC) technology and of the APT programming language. From an organizational point of view, the basic characteristics of Group Technology and Flexible Manufacturing Systems are discussed. The final section of the course examines the field of Additive Manufacturing/3D Printing which is the most recent development in the field of Computer-Aided Manufacturing.

Upon successful completion of the course, students:
- Will have been trained on basic machining
- Will be familiar with the technologies used to assist production using PC and CAM systems.
- Will be more aware of the basic manufacturing technologies

•	Will be familiar with modern prosthetic and 3D printing technologies as well as the capabilities they offer

- 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
- Social, professional and ethical responsibility and sensitivity to gender issues
- Critical consciousness, criticism and self-criticism
- Development of free, creative and inductive thinking

2. COURSE CONTENT

The course covers the following topics:

Week	Topic
1	Introduction
2	Basic manufacturing processes
3	Basic manufacturing processes
4	Cutting processes and machining
5	Cutting processes and machining
6	Cutting processes and machining
7	CNC basics
8	CNC basics
9	CNC basics
10	Additive Manufacturing / 3D Printing
11	Additive Manufacturing / 3D Printing
12	Additive Manufacturing / 3D Printing
13	Group technology and flexible manufacturing systems

In addition, selected case studies from bibliography are presented.

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

3. TEACHING METHODS - ASSESSMENT

TEACHING MODE *Face-to-face, in-class lecturing, on distance teaching and distance learning etc.*	In-class lecturing
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in Teaching, Laboratory Education, Communication with students*	**Teaching:** Lectures with audiovisual media, support of the learning process through the eclass platform

	Communication with students: face-to-face at office hours, email, eclass	
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*	*Activity / Method*	*Semester Workload*
	Lectures	52
	Case studies / exercises	26
	Self-study of lecture material and case studies	57
	Counselling	0.5
	Exams (written)	2
	Course Total	*137.5*

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.*	**Language of exams:** Greek **Assessment Methods:** After the last lecture, the exam material is posted at eclass. The final course grade is formed by the written exams (100%) taken in the examination period of the spring semester and, in case of failure, in the September resits The written examination includes problem solving/exercises, short-answer and open-ended questions. It is conducted with closed books. 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.

4. SUGGESTED BIBLIOGRAPHY

-*Suggested Bibliography :*
- Book [68379767]: Additive Manufacturing Technologies, 2nd ed., Gibson I., Rosen D., Stucker B. [Translation/Editing in Greek: V. Dedoussis, I. Giannatsis]
- Book [320305]: Modern Computer-Aided Manufacturing Technologies [in Greek], I. Giannatsis, V. Dedousis, V. Kanellidis, http://hdl.handle.net/11419/4521
- Book [41955474]: CAD/CAM Systems and 3D Modeling [in Greek], Bilalis N.A., Maravelakis E.

-*Scientific Journals:*
- Computer-Aided Design
- International Journal of Advanced Manufacturing Technology
- Rapid Prototyping Journal

-*Lecture Notes*