COURSE OUTLINE

1. GENERAL INFORMATION

SCHOOL	MARITIME AND INDUSTRIAL STUDIES		
DEPARTMENT	INDUSTRIAL MANAGEMENT AND TECHNOLOGY		
LEVEL OF STUDY	UNDERGRADUATE		
COURSE UNIT CODE	ΤΕΠΑΡ04	**SEMESTER OF STUDY**	8th
COURSE TITLE	SPECIAL TOPICS OF ADVANCED MANUFACTURING TECHNOLOGIES		
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		4	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 generalknowledge, skillsdevelopment*	Special background		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTIONandEXAMINATION/ASSESSMENT:	Greek / English (in ERASMUS class)		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.unipi.gr/courses/BDT203/		

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 covers developments in the field of production technologies, especially in the manufacturing sector of the industry. Specific modules presented in the course are: Basic manufacturing technologies and their features, Computer Integrated Manufacturing, Flexible production systems, Basic automation and control technologies, Rapid manufacturing and additive manufacturing, Micro / nano-scale manufacturing technologies, Virtual Modeling and Simulation, Reverse Engineering and Geometric Data Transfer Standards.

Upon successful completion of the course, the students will:

- Be familiar with advanced analytical and manufacturing design tools,
- Possess advanced knowledge of issues concerning the development, design, techno-economic evaluation and environmental burden of production of traditional and innovative products, which entails a critical understanding of theories and principles pertaining to a very broad and interdisciplinary field,
- Have advanced skills and will be able to demonstrate the skill and innovation required to solve complex and unpredictable production problems with modern technologies,

- Take responsibility for managing the professional development of individuals and teams by providing both research and development advice.

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, using technologies that are necessary according the case
- Adapting to new situations
- Decision-making
- Independent work
- Team work
- Working in an international environment (ERASMUS)
- Working in an interdisciplinary environment (ERASMUS)
- 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

2. COURSE CONTENT

The course covers the following topics:

- Basic manufacturing technologies
- Rapid Manufacturing and Additive Manufacturing
- Computer Integrated Manufacturing – CIM
- Virtual modeling/simulation
- Micro/nano-scale Manufacturing Technologies
- Reverse Engineering and Geometric Data Transfer Standards

The course includes 2-hour theory lectures and 5 CAD laboratory classes. The laboratory part is carried out in the Laboratories of Production Information Systems and Advanced Manufacturing Technologies and Testing. Commercial CAD packages such as ProEngineer and CATIA software are used. Students are trained in workshops with a rotating system. The program of workshops is posted on eclass at the beginning of the semester. In addition, students are divided into groups to accomplish a project on the method of the production of a product.

In addition, articles, audiovisual lecture material, web addresses, useful information, exercises and/or software 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

<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 commercial software, i.e. ProEngineer and CATIA
Communication with students: 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>42</td></tr>
<tr><td>Laboratory</td><td>10</td></tr>
<tr><td>Laboratory exercises (report)</td><td>28</td></tr>
<tr><td>Project</td><td>29.5</td></tr>
<tr><td>Self-study of lecture material and case studies</td><td>25.5</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>
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<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 class)

Assessment Methods: After the last lecture, the exam material is posted at eclass. The final course grade is formed as follows:
• By the project (30%)
• By the laboratory reports (30%)
• By the 2-hour written exams (40%) taken in the examination period of the fall semester and, in case of failure, in the September resits

The written examination includes problem solving/exercises and short-answer 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 e-class. 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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4. SUGGESTED BIBLIOGRAPHY

-Suggested Bibliography :

- Book [41955474]: CAD/CAM Systems and 3D Modeling - New Edition [in Greek], Bilalis Nikolaos A., Maravelakis Emmanouil.
- Book [320305]: Modern computer-aided manufacturing technologies [in Greek], Giannatsis I., Dedousis B., Kanellidis B., http://hdl.handle.net/11419/4521
- Book [68379767]: Additive Manufacturing Technologies [in Greek], Gibson Ian, Rosen David, Stucker Brent

-Scientific Journals:

- Computer-Aided Design
- International Journal of Advanced Manufacturing Technology
- Robotics and Computer-Integrated Manufacturing

-Lecture Notes