COURSE OUTLINE

(1) OVERVIEW

SCHOOL	MARITIME & INDUSTRY		
DEPARTMENT	INDUSTRIAL MANAGEMENT & TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΤΕΠΑΡ04	SEMESTER	8
COURSE TITLE	SPECIAL TOPICS OF ADVANCED MANUFACTURING TECHNOLOGIES		

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, Laboratory & Project	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*	E - 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 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, technoeconomic 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 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	*Project design and management*
Adaptation to new situations	*Respect for diversity and multiculturalism*
	Respect for the natural environment

Decision making *Autonomous work* *Teamwork* *Working in an international environment* *Working in an interdisciplinary environment* *Generation of new research ideas*	*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* *…* *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
- Project design and management
- 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:

- 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 software packages such as 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.

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:** commercial mechanical 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.* *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,*	

Activity	Semester Workload
Lectures	42
Laboratory	10
Project	40
Self-study of lecture material and case studies	43
Consultation Support	0.5
Exams (written)	2
Course Total	**137.5**

are specified in accordance with the principles of ECTS	
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: • 30% by the project • 30% by the Laboratory reports • 40% by the written exams 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 and short-answer questions. It is conducted with closed books. 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:

- Gibson, I., Rosen, D., Stucker, B. (2017). Additive Manufacturing Technologies, Kritiki Publications, ISBN: 9789605861896 [68379767] – 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