COURSE OUTLINE

1. GENERAL INFORMATION

SCHOOL	MARITIME AND INDUSTRIAL STUDIES
DEPARTMENT	INDUSTRIAL MANAGEMENT AND TECHNOLOGY
LEVEL OF STUDY	UNDERGRADUATE
COURSE UNIT CODE	ΤΕΠΑΡ29-1 **SEMESTER OF STUDY** 8th
COURSE TITLE	PRODUCT DEVELOPMENT AND INNOVATION

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, 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 class)
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.unipi.gr/courses/BDT140/

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*

This course is an introduction to modern product design and development processes. The course covers the major aspects of product development: Product Planning, Customer Needs, Product Specifications, Concept Generation, Concept Selection, Concept Testing, Product Architecture, Industrial Design, Prototyping, Design for Safety, Design for Environment, and Intellectual Properties. Most of the principles that are presented concern mainly products but can also be applied to services or software products. Particular emphasis is given to capturing customer needs and converting them into product design and development specifications. During the weekly lectures, relevant case studies are presented and analyzed, while students are asked to complete a project related to the study of the development of a product based on the topics covered in the course.

Using up to date bibliography, case studies and relevant audiovisual material, students will develop skills regarding:

- Their capabilities in designing and developing new innovative products
- The coordination of numerous projects and interdisciplinary teams for achieving the

common purpose called "final product"

- 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 (ERASMUS)
- Working in an interdisciplinary environment (ERASMUS)
- Introduction of innovative research
- 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 main stages of product development, such as: production planning, determination of user needs, product concepts generation, selection of the best concept for development, economic analysis, concept testing, industrial design, design for the environment, prototype manufacturing.

The lecture program is presented in detail herebelow:

Week	Topic
1	Basic concepts of Research & Development of products
2	Basic concepts of technological innovation
3	Introduction to product design and development
4	Organizations and processes
5	Product development planning
6	Determination of customer needs, product specifications
7	Product concept generation, product concept selection
8	Product concept testing
9	Product architecture, industrial design
10	Design for production, principles of standards
11	Design for reliability, design for the environment
12	Patents and Intellectual Properties, Project presentation
13	Project presentation

Also, students participate in discussions at the end of the presentation of each topic with the use of examples of real products. Case studies are presented from papers and related books, such as, for

example, Product Design and Development, 5th Edition, by Karl T. Ulrich and Steven D. Eppinger, McGraw Hill, International Edition, 2012. Students are organized into small project teams to study the development of a product based on the principles and methodologies presented in the lectures.

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.*	***Activity / Method***	***Semester Workload***
	Lectures	52
	Project (essay and presentation)	40
	Self-study of lecture material and case studies	43.5
	Counselling	0.5
	Exams (written)	2
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	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 / 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 (40%): 30% from the quality of the methodology and presentation and 10% from the analysis of case studies • By the written exams (60%) taken in the examination period of the spring semester and, in case of failure, in the September resits The written examination includes 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: Product Design and Development, K.T. Ulrich, S.D. Eppinger, 2012.

-Scientific Journals: not applicable
-Lecture Notes