

COURSE OUTLINE

1. GENERAL INFORMATION

SCHOOL	MARITIME AND INDUSTRIAL STUDIES		
DEPARTMENT	INDUSTRIAL MANAGEMENT AND TECHNOLOGY		
LEVEL OF STUDY	UNDERGRADUATE		
COURSE UNIT CODE	TEΠAP06-1	SEMESTER OF STUDY	7 th
COURSE TITLE	MATERIALS SELECTION IN PRODUCT DESIGN (ELECTIVE COURSE)		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures, Lab, Project		5	5.5
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at section 4.</i>			
COURSE TYPE <i>general background, special background, specialized general knowledge, skills development</i>	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/BDT198/		

2. LEARNING OUTCOMES

<p>LEARNING OUTCOMES <i>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:</i></p> <p>APPENDIX A</p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications' cycle, according to the European Higher Education Area's Qualification Framework.</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and APPENDIX B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>The course aims to introduce students to the principles to be considered in order to select one or more materials when designing a product or a group of products. In addition, the dual role of materials, ie the need to be functional from a technical point of view, but also to create the properties of the product, will be emphasized.</p> <p>The aim of the course is to provide students with basic knowledge to help them to:</p> <ul style="list-style-type: none"> • Understand the materials and their production processes • Understand the properties of the materials • Choose the materials that best meet the design requirements • Familiarize themselves with tools for comparing and selecting materials
<p>General Competences <i>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</i></p>

Search for, analysis and synthesis of data and information, by the use of technologies that are necessary according to 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, by the use of technologies that are necessary according to 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
- Development of free, creative and inductive thinking

2. COURSE CONTENT

The course covers the following topics:

- Product design
- Material properties and processing
- Methods and tools for material selection
- Product ecodesign
- Innovative materials

Also, students participate in individual or team projects, as well as in laboratory classes, at the Laboratory of Production Management Information Systems. Commercial software packages are used. Students are trained in workshops with a rotation system. The workshop program is posted on the course website and at eclass at the beginning of the semester.

The course program is provided herebelow:

Week	Topic
1	Product design – Introduction to materials - Lab
2	Materials and process trees – Material property charts - Lab
3	Matching material to design - Lab
4	Material selection strategy: Case studies - Lab
5	Material selection strategy: Exercises - Lab
6	Density, mechanical properties of materials - Lab
7	Mechanical properties of materials – material indices - Lab
8	Material indices: Exercises - Lab
9	Exercises – Case studies - Lab
10	Materials & Environment - Lab
11	Industrial Design – Innovative materials - Lab
12	Case studies - Lab
13	Revision – project presentation

In addition, articles, audiovisual lecture material, web addresses, useful information, exercises and case studies are posted at eclass.

3. TEACHING METHODS - ASSESSMENT

<p style="text-align: center;">TEACHING MODE</p> <p><i>Face-to-face, in-class lecturing, on distance teaching and distance learning etc.</i></p>	In-class lecturing / Laboratory teaching																			
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</p> <p><i>Use of ICT in Teaching, Laboratory Education, Communication with students</i></p>	<p>Teaching: Lectures with audiovisual media, support of the learning process through the eclass platform</p> <p>Laboratory Education: Use of commercial software</p> <p>Communication with students: face-to-face at office hours, email, eclass</p>																			
<p style="text-align: center;">COURSE DESIGN</p> <p><i>Description of teaching techniques, practices and methods:</i></p> <p><i>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.</i></p> <p><i>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</i></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><i>Activity / Method</i></th> <th style="text-align: center;"><i>Semester Workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: center;">36</td> </tr> <tr> <td>Exercises</td> <td style="text-align: center;">16</td> </tr> <tr> <td>Laboratory</td> <td style="text-align: center;">16</td> </tr> <tr> <td>Project (essay)</td> <td style="text-align: center;">29</td> </tr> <tr> <td>Self-study of lecture material and exercises</td> <td style="text-align: center;">38</td> </tr> <tr> <td>Counselling</td> <td style="text-align: center;">0.5</td> </tr> <tr> <td>Exams (written)</td> <td style="text-align: center;">2</td> </tr> <tr> <td>Course Total</td> <td style="text-align: center;">137.5</td> </tr> </tbody> </table>		<i>Activity / Method</i>	<i>Semester Workload</i>	Lectures	36	Exercises	16	Laboratory	16	Project (essay)	29	Self-study of lecture material and exercises	38	Counselling	0.5	Exams (written)	2	Course Total	137.5
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<p>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS</p> <p><i>Detailed description of the evaluation procedures:</i></p> <p><i>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</i></p> <p><i>Evaluation criteria are specifically defined and given as well as if and where they are reported and accessible to students.</i></p> <p>Language of exams: Greek / English (in ERASMUS class)</p> <p>Assessment Methods: After the last lecture, the exam material is posted at eclass. The final course grade is formed as follows:</p> <ul style="list-style-type: none"> • By the participation of students in class activities (10%) • By the participation of students in lab activities (10%) • By the project (30%) • By the written exams (50%) taken in the examination period of the winter semester and, in case of failure, in the September resits <p>The written examination includes problem solving/exercises. It is conducted with closed books.</p> <p>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.</p> <p>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.</p>																				

4. SUGGESTED BIBLIOGRAPHY

-Suggested Bibliography :

- Book [12534905]: Materials: Mechanics, Science, Processing and Design [in Greek], M. Ashby, H. Shercliff, D. Cebon

-Scientific Journals: not applicable

-Lecture Notes

-Laboratory Workbook