COURSE OUTLINE

(1) OVERVIEW

SCHOOL	MARITIME & INDUSTRY		
DEPARTMENT	INDUSTRIAL MANAGEMENT & TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	TEHMX05-1	SEMESTER	3
COURSE TITLE	INTRODUCTION TO MECHANICS OF MATERIALS		

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 & Tutorials	4+2	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*	C - 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 aim of the course is to introduce students to fundamentals of mechanics of deformable materials and to the basic tools for stress, strain and deformation analysis. Methods for determining the stresses, strains and deformations produced by applied loads are presented.

Upon successful completion of the course, the students will be able to:

- Analyze and design components and structural members subjected to tension, compression, torsion, bending and combined loads using fundamental concepts of stress, strain, elastic and inelastic behavior.
- Recognize the nature of the loading of a component, classify its response and determine where supplemental material can be found to aid in analysis of its response.

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*
Decision making	*Respect for the natural environment*
Autonomous work	*Demonstration of social, professional, and ethical responsibility and sensitivity to gender issues*
Teamwork	*Exercising critical and self-critical thinking*
Working in an international environment	*Promotion of free, creative, and inductive thinking*
Working in an interdisciplinary environment	*…*
Generation of new research ideas	*Other competences: …*

- Searching, analyzing, and synthesizing data and information, using the necessary technologies

- Autonomous work
- Project design and management
- Demonstration of social, professional, and ethical responsibility and sensitivity to gender issues

(3) COURSE CONTENT

The course covers the following topics:

Week	Topic
1	Introduction - Concept of Failure and Stress
2-4	Stress and Strain – Axial Loading
5	Torsion
6-7	Pure Bending
8-9	Structural Design of Beams and Shafts for Load-Bearing Capacity
10-11	Shearing stresses in Beams
12-13	Deflection of Beams under Bending

The course is also accompanied by tutorial sessions, in order for students to deepen their understanding of the material, resolve any questions they may have, and practice applying theoretical knowledge through practical examples and exercises. 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

<table>
<tr><td>TEACHING MODE
Face-to-face, in-class lecturing, distance teaching and distance learning etc.</td><td>• Face-to-face in a classroom
• Distance teaching & learning (if required)</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY
Use of ICT in Teaching, Laboratory Education, Communication with students</td><td>Teaching: Lectures using modern audiovisual equipment, learning support through the eClass electronic platform, synchronous distance teaching via MS Teams.
Communication with students: face-to-face during office hours, email, eClass platform, MS Teams tools</td></tr>
<tr><td>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, are specified in accordance with the principles of ECTS</td><td>
<table>
<tr><th>Activity</th><th>Semester Workload</th></tr>
<tr><td>Lectures</td><td>52</td></tr>
<tr><td>Tutorial Exercieses</td><td>26</td></tr>
<tr><td>Self-study of tutorial exercises</td><td>23</td></tr>
<tr><td>Self-study of lecture material</td><td>34</td></tr>
<tr><td>Consultation Support</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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</td></tr>
<tr><td>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.</td><td>Language of Assessment: Greek (English for ERASMUS students)
Assessment Mode: Face-to-face and/or distance learning (if required)
Assessment Methods: The final grade of the course is determined 100% by the written exams during the winter semester examination period and, in case of failure, during the September resit examination period.
The written exam includes problem-solving exercises and is conducted closed-book.
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.</td></tr>
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	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:

- Beer, F., Johnston, R., DeWolf, J., Mazurek, D., Sanghi, S. (2018). Mechanics of Materials, 8th Editionn, Tziolas Publications, ISBN: 9789604189939 [112693872] – in Greek
- Hibbeler, R.C. (2012). Mechanics of Materials, Fountas Publications, ISBN: 9789603307372 [22721723] – in Greek
- Philpot, T.A., Thomas, J.S. (2022). Mechanics of Materials, Kritiki Publications, ISBN: 9789605864187 [112691153] – in Greek

- Journals:

- Other educational material:

- Lecture Notes and Supporting Material provided by the Instructor