ΜΟΝΑΔΑ ΔΙΑΣΦΑΛΙΣΗΣ ΠΟΙΟΤΗΤΑΣ Α.Π.Θ.

Introduction to Solid Mechanics

1. GENERAL			
SCHOOL	Faculty of Sciences in collaboration with Faculty of Engineering, Aristotle University of Thessaloniki		
DEPARTMENT	Materials Science and Engineering		
LEVEL OF STUDIES	ISCED level 7 (5-year Integrated Master's programme) ISCED level 6 (4-year BSc programme)		
COURSE CODE	**MSEN 305**	**SEMESTER**	3rd Semester
COURSE TITLE	**Introduction to Solid Mechanics**		
TEACHING ACTIVITIES Lectures, tutorials/problem sessions, laboratory/computer exercises (where applicable), case studies and guided self-study.		**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
		4 (3L + 1T)	6
COURSE TYPE	Background / General knowledge / Scientific area		
PREREQUISITES	None		
TEACHING AND EXAMINATION METHODS	Face-to-face lectures and guided problem-solving sessions; short in-class quizzes; final written examination.		
COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE URL	https://elearning.auth.gr/course/view.php?id=xxxxx		

2. LEARNING OUTCOMES	
Learning Outcomes	By the end of this course, students will be able to: • Construct and Utilize Free-Body Diagrams. • Analyze forces and moments in 3- and 2-Dimensional space • Understand support type in structures • Analyze Internal Forces in Structures. • Analyze properties of cross sections
General Skills	• Search for, analysis and synthesis of data and information, with the use of the necessary technology • Work autonomously • Advance free, creative and causative thinking • Adapting to new situations • Decision-making • Modeling and solving real-world problems • Working in a multidisciplinary environment

3. COURSE CONTENT
Description: This course is the foundation of engineering analysis, covering the principles of force systems on bodies. Focus on drawing Free-Body Diagrams, calculating Internal Forces (shear/moment) in structures.

Key topics:

- Free Body Diagrams & Equilibrium: Modeling and balancing forces.
- Internal Forces: Axial/Shear force and bending moment calculations.
- Properties of cross-sections: Center of gravity and moments of inertia

4. LEARNING & TEACHING METHODS - EVALUATION	
Teaching method	Face-to-face. Lectures, guided problem sessions, short demonstrations, and small-group activities/case studies.
Use of ICT	Use of ICT in Course Teaching, Use of ICT in Communication with Students Description: Use of Information and Communication Technologies (ICT) in teaching the course with tools of modern distance learning (MS-Teams) and asynchronous education (e-learning). Use of learning aids based on ICT: Excel Use of ICT in student assessment: Electronic grading (e-learning). Use of ICT in communication with students: e-leaning, email, MS-Teams.
Teaching organization	The supervised and unsupervised workload per activity is indicated below (total workload complies with ECTS standards).

Activity	Workload/semester (hours)
Lectures	39
Tutorials / problem sessions	13
Mid term evaluation	20
Independent study	60
Exam preparation	16
Final written exam	2
Total	**150**

Student evaluation	Assessment language: English. Written Exams with Problem Solving with Short Answer Written Exams with Problem Solving (Summative)

5. SUGGESTED BIBLIOGRAPHY
EUDOXUS
Beer, F. P., Johnston, E. R., Jr., Mazurek, D. F., & Cornwell, P. J. (2013). Vector mechanics for engineers: Statics (10th ed.). McGraw-Hill Education.
Additional bibliography for study