

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
DEPARTMENT	DEPARTMENT OF CHEMISTRY		
LEVEL OF STUDIES	ISCED level 6 – Bachelor's or equivalent level		
COURSE CODE	EN14	SEMESTER	7th Semester
COURSE TITLE	Strength of Materials		
TEACHING ACTIVITIES <i>If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.</i>		TEACHING HOURS PER WEEK	ECTS CREDITS
		3	3
<i>Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.</i>			
COURSE TYPE <i>Background, General Knowledge, Scientific Area, Skill Development</i>	Skill Development		
PREREQUISITES:	NO		
TEACHING & EXAMINATION LANGUAGE:	GREEK		
COURSE OFFERED TO ERASMUS STUDENTS:	NO		
COURSE URL:	https://eclass2.emt.duth.gr/courses/CHEM_H126/		

(2) LEARNING OUTCOMES

Learning Outcomes <i>Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.</i>	
Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"> • Understand the concepts of equilibrium, mechanics, and material strength • Solve problems based on simple fundamental principles • Understand the experimental process of mechanical behavior of materials • Calculate the forces and stresses developed internally in materials due to external loads 	
General Skills <i>Name the desirable general skills upon successful completion of the module</i>	
<i>Search, analysis and synthesis of data and information, ICT Use Adaptation to new situations Decision making Autonomous work Teamwork Working in an international environment Working in an interdisciplinary environment Production of new research ideas</i>	<i>Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning</i>
Search, analysis and synthesis of data and information, Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment,	

(3) COURSE CONTENT

Week 1: Introduction to the course and types of structures and loading conditions.

Week 2: Mechanical properties of materials.
 Week 3: Tensile, bending, and compression tests.
 Week 4: Stress and strain, external and internal forces, normal stress.
 Week 5: Shear stress, stress-strain diagrams.
 Week 6: Axial tension - compression, Hooke's law, modulus of elasticity.
 Week 7: Allowable stress - safety factor.
 Week 8: Thermal stresses.
 Week 9: Composite materials.
 Week 10: Equilibrium and reactions of beams.
 Week 11: Free body diagram, reactions of two-dimensional beams.
 Week 12: N, Q, M diagrams.
 Week 13: Bending, pure bending, bending deflection, distribution of normal stresses, fundamental law of bending, neutral line.

(4) LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD <i>Face to face, Distance learning, etc.</i>	Face to face	
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) <i>Use of ICT in Teaching, in Laboratory Education, in Communication with students</i>	Use of ICT in Teaching Use of ICT in Communication with students	
TEACHING ORGANIZATION <i>The ways and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.</i> <i>The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.</i>	Activity	Workload/semester
	Lectures	39
	Study	33
	Exams	3
	Total	75
STUDENT EVALUATION <i>Description of the evaluation process</i> <i>Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others</i> <i>Please indicate all relevant information about the course assessment and how students are informed</i>	Written final exam that includes problem solving from different sections of the course.	

(5) SUGGESTED BIBLIOGRAPHY

- Τεχνική Μηχανική-Στατική και αντοχή υλικών, Π.Α. Βουθούνης, Εκδόσεις Ανδρομάχη Βουθούνη, 2019
- Στατική, 11η Έκδοση, Beer Ferdinand P., Johnston Russell E., Mazurek F. David
- Μηχανική των υλικών, BEER P.F., JOHNSTON E.R., DEWOLF T. J., MAZUREK F.D., Εκδόσεις Τζιόλας