COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	EEE.4.3	SEMESTER	4
COURSE TITLE	Engineering Mechanics		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	WEEKLY TEACHING HOURS	CREDITS
	4	5
Total	4	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Scientific Field
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The aim of the course is to present topics related to the fundamental concepts of Mechanics and the means of understanding and solving technical problems in static equilibrium. The module covers equilibrium conditions, reactions due to supports. Normal, shear and bending in cross-sections of a given beam. Bending moment diagrams, intersections and axes for fixed beam, cantilever, Gerber beam. Triangular frames and arcs. Furthermore, the purpose of the course is to prepare the students with the necessary technical skills to understand advanced concepts of engineering mechanics.

Upon completion, students will be able to:

1. Have proven knowledge and understanding of issues related to engineering statics.
2. Be able to solve solid mechanics engineering issues.
3. Be comfortable with the use of engineering statics-related concepts
4. Obtain fundamental knowledge regarding Mechanics of the deformable solid.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

In detail, students will be able to:

1. Search, analyze and synthesize data and information, to solve statics problems
2. Autonomous work

(3) SYLLABUS

In the context of the course students are taught: Concepts of solids and force vectors, types of support fixtures as well as plane equilibrium equations. Isostatic Formations. Magnitude of normal, shear and bending force determination in beam cross-sections. Bending moment diagrams, cantilevers, Gerber beams. Triangular frames and arcs. Trusses. Calculation of deformations. Basic concepts of kinematics of solid bodies, kinematic equations, moments of inertia. Introduction to mechanics of deformable solids (stresses, loading). Theory of Elasticity. Hooke's Law. Uniaxial and biaxial stress. Strain, tension, compression, shearing, bending, torsion and combined loading. Buckling, creep, impact.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Physical presence of students - In classroom
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Use of Audio-visual material and multimedia applications • Update and ancillary training material through the course web site and via e-mail
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.*	

Activity	*Semester workload*
Lectures	39
Preparation of coursework (individual work)	39
Study	42

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	Course total	*120*
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Assessment Language: Greek Written examination: 100% Written examination involves solving a series of exercises related to the entire course subject. Optional coursework preparation of up to 20%, Deducted by the percentage of written examination	

(5) ATTACHED BIBLIOGRAPHY

1. «Μηχανική του απαραμόρφωτου στερεού, Στατική», Βουθούνης, Παναγιώτης Α. , εκδ ιδίου.
2. «Στατική: Μηχανική του στερεού σώματος, ασκήσεις Ι», Εμμανουήλ Ε. Γδούτος, Χρ. Ν. Κάλφας, εκδ. Συμμετρία.
3. «Στατική των ισοστατικών φορέων Διαγράμματα [N], [Q], [M]: Γραμμές επιρροής: Αρχή δυνατών έργων», Γιάννης Β. Γκαρούτσος, εκδ. SPIN
4. «Τεχνική μηχανική Μηχανική Ι: Στατική των στερεών και ειδικά κεφάλαια», Νικόλαος Αραποστάθης, Δημήτριος Αραποστάθης, εκδ. Ίων
5. «Στατική Τεχνική μηχανική», Ferdinand P. Beer, Russell E. Johnston, Elliot R. Eisenberg, εκδ. Τζιόλα.
6. «Εφαρμοσμένη στατική», Walter Wagner, Gerhard Erlhof, εκδ. Κλειδάριθμος
7. «Στατική», Εμμανουήλ Ε. Γδούτος, εκδ. Συμμετρία.
8. «Μηχανική του απόλυτου στερεού, Κινηματική και δυναμική», εκδ. Συμμετρία
9. «Theory of Elasticity», Stephen Timoshenko, Mcgraw-Hill College
10. «Theory of Elastic Stability», Stephen P. Timoshenko, James M. Gere, Dover Publications.
11. «Engineering Mechanics: Statics». (13th Edition), Russell C. Hibbeler, Prentice Hall 2012.
12. «Engineering Mechanics: Statics» [J. L. Meriam, L. G. Kraige, Wiley 2011.
13. «Schaum's Outline of Statics and Strength of Materials» (Schaum's), John Jackson, Harold Wirtz, McGraw-Hill 1983.

«Αντοχή των υλικών», Χαρώνης, Παναγιώτης, Σύγχρονη Εκδοτική.