COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING SCHOOL		
DEPARTMENT	CIVIL ENGINEERING DEPARTMENT		
LEVEL OF STUDIES	UNDER GRADUATE		
COURSE CODE	2306573	SEMESTER	6th
COURSE TITLE	STATICS III		
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
Lectures		5	7
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*	Specialization Course		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek (official)		
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*

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

1. Understand the in-general principles of the theory and application of new methodologies in the static and dynamic analysis of structures.

2. They have acquired the knowledge and skills in modeling and simulation of structures using computer packages.

3. Be able to apply linear static and dynamic analysis in 2d and 3d structures

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…*
	…….

1. Search, analysis and synthesis of data and information, using the necessary technologies and methodologies.

2. Team work (cooperation to achieve an objective)

3. Autonomous work (knowledge of regulations, protocols, and computer software packages)

4. Work in a multidisciplinary environment.

(3) COURSE CONTENT

1) Mathematical Preliminaries
2) Introduction to the Direct Stiffness Method and its application in the analysis of framed structures.
3) Transformation matrices. Vectors of nodal forces and nodal displacements of an element. Degrees of freedom.
4) Stiffness matrices of plane truss and plane frame elements. Formulation of nodal load, nodal displacement and global stiffness matrices of the structure.

Structure support.

5) Calculation of structure's nodal displacements and elements' nodal forces.
6) Introduction to the dynamic analysis. Differences between static and dynamic analysis.
7) Dynamic loads. Free and forced vibrations of single-degree-of-freedom systems. Eigenfrequency and eigenperiod.
8) Damping. Simulation and analysis of a single and two degrees of freedom systems.
9) Equation of motions. Free and forced vibrations of multi-degree-of-freedom systems.
10) The finite element method for the dynamic analysis of shear framed structures.
11) Modal analysis.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Lectures, face-to-face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Teaching using ICT, Communication and Electronic Submission
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.* *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*	

Activity	*Semester workload*
Lectures	65
Preparation for Homework on case studies (individual or group work)	20
Personal study	90
Course total	***175***

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.*	Language of evaluation: Greek Written examination: 100% Optional Course Project: 20% (in this case the written examination is 80%)

(5) ATTACHED BIBLIOGRAPHY

1) Dynamic Analysis of Structures (2012), J.T. Katsikadelis, Symmetria Publications, Athens (in Greek).
2) Dynamics of Structures (2008), A. Chopra, Prentice-Hall, NJ.