ETY705 - Materials Laboratory VI (Experimental Mechanical Behavior and Quality Control

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ETY705	**SEMESTER**	7
COURSE TITLE	Materials laboratory VI (experimental mechanical behavior and quality control		
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 / Labs / Tutorials		5	6
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE *general background, special background, specialized general knowledge, skills development*	Specialized background		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO		
COURSE WEBSITE (URL)	http://mss-nde.uoi.gr/greek/409%20-%20ETY%20705/index.html		

(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 successful completion of the course the students will:

• Understand the basic methods of mechanical testing and nondestructive testing for evaluating the mechanical behavior of materials

• Gain direct practical experience regarding the procedures for macroscopic characterization of materials

• Be able to understand and apply international testing standards, where they exist

• Gain practical experience in specimen preparation

• Be able to select the testing conditions and perform experiments successfully

• Be able to analyze the experimental data and process the results

• Be taught various methods of measurement and analysis of observations, which are essential knowledge for any kind of experimental work

• Get the necessary experience to work properly and methodically to assess the reliability of experimental results
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* *Adapting to new situations* *Decision-making* *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas* *Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *…….*
• Autonomous Work • Teamwork • Work in interdisciplinary environment

(3) SYLLABUS

Response of metallic materials to tensile loading, Acoustic emission, Infrared thermography, Creep, Response of metallic materials to cyclic loading (fatigue), Ultrasound, Electrical conductivity, Bending strength of cement-based materials.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In class laboratory exercises
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	
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*
Laboratory exercises	39
In class lectures	26
Self-study (project): Analysis of experimental data	39
Self-study for preparing the next laboratory exercise and review possible safety issues	26
Final exam preparation	20
Course total	150

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*	LANGUAGE OF EVALUATION: Greek METHOD OF EVALUATION: The presence in the laboratory is mandatory, and only one justified absence is permitted. To students who have

examination of patient, art interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	one justified absence, may be given the right to conduct the missed laboratory exercise at the end of the semester. For the success of the laboratory, preparation is required. Each student must be sufficiently prepared on the theoretical background of the experiment, as well as the experimental procedure to be followed in the laboratory. A short oral or written examination is preceded by each laboratory exercise. Final written examination with multiple choice questions and/or problem solving and/or comparative evaluation of elements of the theory. The total score of the course includes: (a) the score of (oral and / or written) examination during the laboratory experiment (average), where the student's preparation for the exercise and the understanding while conducting the exercise are evaluated, and (b) the score of final written examination, at 30:70.

(5) ATTACHED BIBLIOGRAPHY

-Suggested bibliography:

- T.E. Matikas, Laboratory Exercises Materials 6 (course notes), University of Ioannina Printing, 2013.
- Sotiropoulou, D. Prassa, Strength of Materials – Laboratory Applications, ION Publications, 2003.
- G. Papadopoulos, Experimental Fracture Mechanics (Optical methods of stress analysis), Kleidarithmos Publications, 2007.

-Related academic journals: