

ETE908 - Special topics of nondestructive evaluation of materials and structures

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ETE908	SEMESTER	9
COURSE TITLE	Special topics of nondestructive evaluation of Materials and structures		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>	WEEKLY TEACHING HOURS	CREDITS	
Lectures / Labs / Tutorials	3	3	
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialized general knowledge, skills development</i>	Specialized general knowledge		
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/537%20-%20ETE%20908/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*

The course is a compulsory specialized general knowledge course of the mechanics branch. The course aims to familiarize students with advanced notions of nondestructive evaluation of materials and structures.

Upon successful completion of the course, the student will be able to:

- Understand the necessity for developing nondestructive methodologies for the assessment of damage in materials and structures due to mechanical or environmental loadings.
- Get basic knowledge on advanced nondestructive methods, such as acoustic

microscopy, nonlinear acoustics, and lock-in thermography, which are the subject of state-of-the-art research.

- Evaluate experimental results regarding advanced nondestructive methods that are subject of the course.

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

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Others...

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- Autonomous Work

(3) SYLLABUS

The purpose of the course is to use nondestructive testing data for assessing the structural integrity of materials and structures. Structural health monitoring of materials and structures includes the development of nondestructive methodologies for real-time damage assessment (aging), i.e. during mechanical or environmental loading of the material. Advanced nondestructive methods (i.e. acoustic microscopy, nonlinear acoustics, lock-in thermography, acoustic emission, stress analysis using x- ray, electron or neutron diffraction) are discussed in the course.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	In class lectures	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>		
TEACHING METHODS <i>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</i>	Activity	Semester workload
	Lectures	39
	Self-study	18
	Final exam preparation	18
	Course total	75
STUDENT PERFORMANCE EVALUATION <i>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</i>	LANGUAGE OF EVALUATION: Greek METHOD OF EVALUATION: (i) Final written examination with multiple	

<p><i>examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>choice questions and/or problem solving (ii) Comparative evaluation of elements of the theory (iii) Project</p>
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(5) ATTACHED BIBLIOGRAPHY

<p><i>-Suggested bibliography:</i></p> <ul style="list-style-type: none">- T.E. Matikas, D. Aggelis, Nondestructive Testing, Electronic Publication, 1st Edition, Kallipos Digital Publishing, 2015.- N. Megos, Radiologic technology: classic, Axial, nuclear magnetic, bone mineral density, Telemedicine, Ultrasound, G. Parikos EE Publications, 1996. <p><i>-Related academic journals:</i></p>
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