ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Α .Δ Ι .Π .
ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ & ΠΙΣΤΟΠΟΙΗΣΗΣ
ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΣΤΗΝ ΑΝΩΤΑΤΗ
ΕΚΠΑΙΔΕΥΣΗ

HELLENIC REPUBLIC
H .Q .A .
HELLENIC QUALITY ASSURANCE
AND ACCREDITATION AGENCY

ΤΕΧΝΟΛΟΓΙΚΟ ΕΚΠΑΙΔΕΥΤΙΚΟ ΙΔΡΥΜΑ ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ ΚΑΙ ΘΡΑΚΗΣ
ΜΟΝΑΔΑ ΔΙΑΣΦΑΛΙΣΗΣ ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΤΕΙ ΑΜΘ

Quality Assurance in Higher Education
Course Data Collection Form

ΤΕΧΝΟΛΟΓΙΚΟ ΕΚΠΑΙΔΕΥΤΙΚΟ ΙΔΡΥΜΑ
ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ & ΘΡΑΚΗΣ
ΑΓΙΟΣ ΛΟΥΚΑΣ,
65404 ΚΑΒΑΛΑ

EASTERN MACEDONIA AND THRACE
INSTITUTE OF TECHNOLOGY
AGIOS LOUKAS
65404 KAVALA

COURSE OUTLINE

(1) GENERAL

Name and surname of lecturer	Jacob Fantidis		
SCHOOL	of Technological Applications		
ACADEMIC UNIT	Department of Electrical Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ZN6	**SEMESTER**	7th
COURSE TITLE	Non Destructive Testing		

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 and Exercises	3 Th.	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*	Skills development
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	http://eclass.teikav.edu.gr/ED158/

(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*

Purpose and aim of the course is to educate the students with the methods of non-destructive testing in order to determine the existence and the size of defects in a structure, without damage or affect the functionality of the construction. Also to understand the function and utility of the different methods in the industry. Extensive reference is made to the applications of the different methods and instruments which used for this purpose.

The course includes many sections: Non-destructive methods. Optical Methods. Radiographic methods using X-ray and gamma ray, neutron radiography. Digital radiography. Thermographic inspections, ultrasonic methods. Evaluation and comparison of nondestructive control applications. Applications of non-destructive testing.

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

- Know the importance of technical non-destructive testing.
- To master the fundamentals of technical non-destructive testing and categorizing them.
- Know the usefulness of each method depending on the nature of the test object.
- Know the analysis of specific techniques and their significance in predicting and repairing faults.
- To know the basic laboratory equipment

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…*
	…….

Application of knowledge in practice
Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Team work
Working in an interdisciplinary environment
Production of free, creative and inductive thinking

(3) SYLLABUS

I. Optical Methods, Visual Inspection, Visual inspection with a microscope, Visual inspection with Video Recording (Video Inspection), Optical methods Laser: Holography (Holography), Dynamic Surface Control (Dynamic Surface-Inspection)
II. Liquid Penetrant Flaw testing.
III. Acoustic Emission, AE - ultrasonic range.
IV. Thermal Emission).
V. Electrical methods, Eddy Currents

VI.	Magnetic methods, Testing Magnetic Ink / Powder, Magnetic particle inspection, Magnitografia, Magnetic flux leakage - MFL
VII.	Engineering Controls Methods, Engineering Resistance Methods, Oscillations Tests.
VIII.	Ultrasonic inspection, Time of Flight Diffraction ultrasonics - TOFD, Phased Array ultrasonics, Internal Rotary Inspection System - IRIS.
IX.	Radiographic methods: X-rays and gamma ray, Digital Tomography, subatomic particles (neutrons, protons) (Neutron Radiography)
X.	Thermography.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face (in the classroom)
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use slides, website of the course with supporting and auxiliary material,
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*	
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.*	Theoretical Course I. Final written examination (50%) with multiple choice questions II. Team work (30%) III. Presentation of the team work (20%).

Activity	***Semester workload***
Lectures	39
Team work	31
Independent study	42.5
Course total	112.5

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

1. Paul E. Mix, Introduction to Nondestructive Testing: A Training Guide, John Wiley & Sons, New Jersey, 2005.
2. Baldev Raj, Tammana Jayakumar, M. Thavasimuthu, Practical Non-Destructive Testing, Woodhead Publishing, New Delhi 2002.
3. Jayamangal Prasad, C. G. Krishnadas Nair, Non-Destructive Test And Evaluation Of Materials, McGraw-Hill Education, 2008.
4. Xavier Emanuel Gros, Ndt Data Fusion, Butterworth-Heinemann, 1997.
5. Bray D. E., McBride D., Nondestructive Testing Techniques, New York, John Wiley & Sons, 1992.
6. J. C. Domanus, Collimators for Thermal Neutron Radiography-An Overview, D. Reidel Publishing Company, 1987.
7. Chuck Hellier, Handbook of Nondestructive Evaluation, McGraw Hill Professional, 2012.