T.C. ESKİŞEHİR OSMANGAZİ UNIVERSITY
ENGINEERING AND ARCHITECTURE FACULTY
MECHANİCAL ENGINEERING DEPARTMENT

COURSE INFORMATION FORM

SEMESTER	Spring

COURSE CODE	151818xxx-151838xxx	COURSE NAME	Nondestructive Evaluation Research

SEMESTER	WEEKLY COURSE PERIOD			COURSE'S			
	Theory	Practice	Laboratory	Credit	ECTS	TYPE	LANGUAGE
8	1	4	0	3	6	COMPULSORY (X) ELECTIVE ( )	Turkish

COURSE CATAGORY			
Basic Science	Basic Engineering	Engineering Subjects [if it contains considerable design, mark with (√)]	Social Science
	X	(√)	

ASSESSMENT CRITERIA			
	Evaluation Type	Quantity	%
MID-TERM	Mid-Term	1	30
	Quiz		
	Homework		
	Project	1	40
	Report		
	Others (……)		
FINAL EXAM			30

PREREQUIEITE(S)	
COURSE DESCRIPTION	Explaining basic concepts regarding nondestructive evaluation (NDE) and conventional NDE methods, conducting research on NDE measurement techniques, ultrasonic transducers, and electromechanical techniques; Introduction to numerical analysis methods; Conducting research on NDE for metallic, composite materials, welds and lap-joints
COURSE OBJECTIVES	
ADDITIVE OF COURSE TO APPLY PROFESSIONAL EDUATION	
COURSE OUTCOMES	Sufficient knowledge of NDE engineering; an ability to apply theoretical and practical knowledge on solving and modeling of NDE problems. Ability to determine, define, formulate and solve complex NDE engineering problems; Ability to select and use convenient analytical and experimental NDE methods Ability to set up and conduct experiments and ability to analyze and interpretation of experimental results in order to investigate NDE problems Ability to organize, to progress, and conclude and to present the plan, process, and the results in well-organized manner and in aware of ethical rules
TEXTBOOK	Structural Health Monitoring with Piezoelectric Wafer Active Sensor, Victor Giurgiutiu, 2014
OTHER REFERENCES	**-Nondestructive Testing Methods and New Applications Edited by Mohammed Omar, InTech Publication** **-Nondestructive testing handbook Edited for the Society for Nondestructive Testing by Robert C. McMaster** **-Nondestructive Testing of Materials and Structures, Proceedings of NDTMS-2011 İstanbul Turkey May 15-18, 2011, Springer**
TOOLS AND EQUIPMENTS REQUIRED	Computer, ANSYS and/or COMSOL and/or ABAQUS finite element modeling software

COURSE SYLLABUS	
WEEK	**TOPICS**
1	Introduction to basic concepts
2	Conventional nondestructive evaluation (NDE) methods
3	Research on modern NDE methods
4	Research on ultrasonic transducers
5	Research on electromechanical measurement methods
6	Using numerical analysis methods in NDE
7	Introduction to finite elements methods: Modal analysis, frequency response analysis, transient response analysis
8	Mid-Term Examination
9	Mid-Term Examination
10	Research on NDE for metallic materials
11	Research on NDE for composite materials
12	Research on NDE for lap-joints
13	Research on NDE for weld
14	Thermal analysis: Temperature field and thermal stress analysis
15,16	Final Exam

NO	PROGRAM OUTCOMES	3	2	1
1	Sufficient knowledge of engineering subjects related with mathematics, science and own branch; an ability to apply theoretical and practical knowledge on solving and modeling of engineering problems.	**X**		
2	Ability to determine, define, formulate and solve complex engineering problems; for that purpose an ability to select and use convenient analytical and experimental methods.	**X**		
3	Ability to design a complex system, a component and/or an engineering process under real life constrains or conditions, defined by environmental, economical and political problems; for that purpose an ability to apply modern design methods.	**X**		
4	Ability to develop, select and use modern methods and tools required for engineering applications; ability to effective use of information technologies.	**X**		
5	In order to investigate engineering problems; ability to set up and conduct experiments and ability to analyze and interpretation of experimental results.	**X**		
6	Ability to work effectively in inner or multi-disciplinary teams; proficiency of interdependence.	**X**		
7	Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language.		**X**	
8	Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement.	**X**		
9	Understanding of professional and ethical issues and taking responsibility		**X**	
10	Awareness of project, risk and change management; awareness of entrepreneurship, innovativeness and sustainable development.		**X**	
11	Knowledge of actual problems and effects of engineering applications on health, environment and security in global and social scale; an awareness of juridical results of engineering solutions.			**X**
1:None. **2**:Partially contribution. **3**: Completely contribution.				

Prepared by: Tuncay Kamaş **Date: 9 Temmuz 2015**

Signature(s):