COURSE IDENTIFICATION FORM

Course Code and Name: IM5012 SHELL AND PLATE THEORY				**Department of :** CIVIL ENGINEERING / MASTER PROGRAMME			
Semester	**Theoretic Hour**	**Practice Hour**	**Total Hour**	**Credits**	**ECTS**	**Education Language**	**Type: Compulsory Elective**
Atumn/Spring	3	0	3	3	5	Turkish	Optional
Prerequisite (s)							
Instructor						**Mail :** **Web :**	
Course Assistant						**Mail :** **Web :**	
Groups / Classes							
Course Aim	To provide understanding of the behavior of plates under vertical loads, to determine the behavior of simple plates under vertical loads using plate equations. To provide understanding of complex problems of plate theory. To solve plate problems using various numerical methods.						
Course Goals	Calculation of floor and/or similar elements with different geometries according to plate theory.						
Course Learning Outs and Proficiencies	• Investigation of plate problems in structural engineering • Understanding the behavior of plate type structural load-bearing systems under vertical loads, • Developing appropriate solutions to problems that arise in structural design, • Understand the basic problems of plate theory.						
Course Basic and Auxiliary Contexts	• Azer Arastunoglu Kasumov , Elasticity Theory and Structural Statics of Space Rod, Membrane , Plate Shell, Solid Systems • SP Timoshenko , S. Woinowsky Krieger ; Theory of Plates and Shells , McGraw Hill , 1959. • K. Girkmann (translated by S. Tameroğlu); Surface Load Bearing Systems, ITU, 1964. • R. Szilard ; Theories and Applications of Plate Analysis, John Wiley & Sons , 2004. • E. Ventsel , T. Krauthammer ; Thin Plates and Shells , Marcel Deccer , Inc. , 2001. • V. Panc ; Theories of Elastic Plates , Noordhoff International						

	Publishing, 1975. • Ercument Koksal, Static Stability and Dynamic Analysis of Shells and Plates Sample Solutions and Tables, Literature Publishing, 2003
Methods of Give a Lecture	Face to Face

		If Available, to Sign (x)	General Average Percentage (%) Rate
Assessment Criteria	**Midterm Exam**	**X**	**50**
	1. Quiz		
	2. Quiz		
	3. Quiz		
	4. Quiz		
	Oral Examination		
	Practice Examination (Laboratory, Project etc.)		
	Final Exam	**X**	**50**

Semester Course Plan

Week	Subjects
1	Basic assumptions, Internal force- displacement relations
2	Balance equations
3	Plate equation, Boundary conditions, Strain energy
4	Rectangular plates, Navier and Levy solutions
5	Circular plates
6	Variational methods, Ritz and Galerkin approximate solutions
7	Different shaped plates
8	Midterm Exam
9	Bending of anisotropic plates
10	Plates on elastic foundation
11	Numerical calculation methods, Finite difference method, Finite element method, Boundary element method
12	Nonlinear analysis of plates, Yield lines method
13	Transverse shear strain effect
14	Finite vertical displacement of plates