COURSE IDENTIFICATION FORM

Course Code and Name: IM5055 / FINITE ELEMENT THEORY IN STRUCTURAL ENGINEERING				**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		Assoc. Prof. Dr. Alper POLAT				**Mail :** **alperpolat@munzur.edu.tr** **Web :**	
Course Assistant						**Mail :** **Web :**	
Groups / Classes							

Course Aim	To introduce the finite element method for structural analysis and to give detailed information required for complex modelling with software packages.
Course Goals	Rod equations, work of internal and external forces, potential and kinetic energy, shape function, equation of motion, strain element, torsion element, bending and frame elements, elastic stability, complex modelling with package programmes in structural engineering.
Course Learning Outs and Proficiencies	• Gains knowledge about numerical solution methods. • Gains knowledge about the basic equations used in structural analysis. • Gains knowledge about element equilibrium matrices, stiffness matrices and kinematic matrix. • Gains knowledge about stiffness relations in the total system. • Gains knowledge about the calculation of planar systems by finite element method.
Course Basic and Auxiliary Contexts	• Omurtag, M.H., Çubuk Sonlu Elemanlar, Birsen Yayınevi, İstanbul, 2010. • Cook, R.D., Malkus, D.S., and Plesha, M.E., and Witt R.J., Concepts and Applications of Finite Element Methods, 4 th Edition, John Wiley & Sons, Inc., 2001. • Tirupathi R. Chandrupatla, Ashok D. Belegundu, Mühendislikte Sonlu Elemanlara Giriş, Çeviren: Sami Karadeniz, 4. Basımdan Çeviri • Jacob Fisher , Ted Belytschko, Sonlu Elemanlar Yönetimine Giriş, Nobel Akademik Yayıncılık, Çeviren: Babür Deliktaş , Mehmet Ali Güler , Murat Yazıcı

Methods of Give a Lecture	Face to Face

Assessment Criteria		**If Available, to Sign (x)**	**General Average Percentage (%) Rate**
	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	Rod Equations, Work of Internal and External Forces
2	Potential and Kinetic Energy
3	Shape Function, Equation of Motion
4	Elongation Element
5	Torsion Element
6	Bending and Frame Elements
7	Shell Elements
8	Midterm Exam
9	Solid body elements
10	Elastic Stability
11	The use of package programmes in the solution of engineering structures, issues to be considered in the use of package programmes, assumptions used in modelling structural elements
12	Detailed information about commands and short applications
13	Application
14	Application