COURSE IDENTIFICATION FORM

Course Code and Name: IM5051 EARTHQUAKE 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		Prof. Dr. Burak YÖN				**Mail : burakyon@munzur.edu.tr Web :**	
Course Assistant						**Mail : Web :**	
Groups / Classes							
Course Aim	To teach the characteristics and forms of earthquakes, the magnitudes used to express the earthquake danger, determining the effects of earthquakes on structures and the methods followed in earthquake specifications for this purpose, and ways to determine the earthquake hazard in more detail (deterministic and probabilistic).						
Course Goals	• To learn the basic concepts of earthquake engineering, types of earthquakes and their effects. • To analyse how structures behave during earthquakes and to understand the factors affecting this behaviour. • To learn the engineering calculations and design criteria required for earthquake-resistant building design.						
Course Learning Outs and Proficiencies	• Students will be able to create elastic and inelastic response spectra. • Students will be able to create equations of motion of multi-storey buildings under the influence of earthquakes. • Students will be able to analyse multi-storey buildings in modal and time domains. • Students will be able to use capacity-based design.						
Course Basic and Auxiliary Contexts	• ASCE 7 Minimum Design Loads for buildings and other Structures. • Chopra, A. K., “Dynamics of Structures, Theory and Applications to Earthquake Engineering”, Prentice Hall, 2001 • Earthquake Engineering Handbook, W.-F. Chen and C. Scawthorn,CRC Press, 2003 • Türkiye Building Earthquake Regulation • Z. Celep, Introduction to Earthquake Engineering and Earthquake Resistant Building Design (in Turkish). • Newmark, N. M., Rosenblueth, E.; Fundamentals of Earthquake						

	Engineering, Prentice Hall, 1971 • Geotechnical Earthquake Engineering, S. L. Kramer, Prentice Hall, 1996
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	Forms of earthquakes, Plate tectonics, Fault types
2	Earthquake records, seismograph types and equations of motion
3	Characteristics of earthquakes: size, distance, duration, intensity. Information about various violent scales.
4	Creating the elastic response spectrum of an earthquake, Design spectra, Newmark Elastic design spectrum
5	Creating inelastic response spectrum, Strength reduction coefficients
6	Establishing equations of motion of multi-storey buildings under earthquake loads
7	Establishing equations of motion of multi-storey buildings under earthquake loads
8	Midterm Exam
9	Seismic hazard analysis: Deterministic approach
10	Seismic hazard analysis: Probabilistic approach
11	Reinforced concrete horizontal structural systems and capacity-based design
12	Reinforced concrete horizontal structural systems and capacity-based design
13	Steel horizontal carrier systems and capacity-based design

14	Final Exam