T.C.
MUNZUR ÜNİVERSİTESİ
Lisansüstü Eğitim Enstitüsü Müdürlüğü

COURSE IDENTIFICATION FORM

Course Code and Name: IM5005 / SPECIAL TOPİCS				**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	Elective
Prerequisite (s)							
Instructor						**Mail :** **Web :**	
Course Assistant						**Mail :** **Web :**	
Groups / Classes							

Course Aim	Learn the material and element behaviors of reinforced concrete elements. Learn the limit design calculation of reinforced concrete elements under mathematical models. Teach the nonlinear behaviors of reinforced concrete elements under design loads.
Course Goals	Structural design, concepts of confined and unconfined concrete. Behavior models accepted for steel, determination of ultimate limit moment and curvature in reinforced concrete beams and columns with confined sections, considering the hardening in the reinforcement. Analysis of beam and column sections according to yield limit, curvature ductility and moment-curvature relations, redistribution of moments, concept of plastic hinge and determination of rotation capacities.
Course Learning Outs and Proficiencies	• It will be able to provide students with the ability to conduct research They will learn concrete models in detail. • They will be able to analyze and design reinforced concrete beam and column sections by considering material models reflecting the behavior of confined and unconfined concrete and hardened steel. • They will be able to analyze reinforced concrete beam and column sections in yield and ultimate limit states. • They will be able to determine plastic joint rotation capacities.
Course Basic and Auxiliary Contexts	• Mac Gregor, J.G., Reinforced concrete mechanics and design, Prentice-Hall International Inc., New Jersey, 1997. • Park, R., and Paulay, T., Reinforced concrete structures, Wiley, New York, 769 pp, 1975. • Hognestad, E., 1951: A study of combined bending and axial load in reinforced concrete members. University of Illinois Bulletin. Vol. 49, no. 22. • Mander, J. B., 1984. Seismic design of bridge piers, PhD Thesis, University of Canterbury, Christchurch, New Zealand. • Mander, J. B., Priestley, M. J. N. Park, R. , 1988: Observed stress-strain behavior of confined concrete. Journal of Structural Engineering. Vol. 114, No. 8, p. 1827-1849. • Mander, J.B., Priestley, M.J.N., Park, R., 1988: Theoretical stress-

	strain model for confined concrete. Journal of the Structural Division. Vol. 114, no. 8, pp. 1804–1826. • Saatcioğlu, M., Grira, M., 1999: Confinement of reinforced concrete columns with welded reinforcement grids. American Concrete Institute Structural Journal. Vol. 96, no. 1, pp. 29-39. • Saatcioglu, M., Ozcebe, G., 1989: Response of reinforced concrete columns to simulated seismic loading. American Concrete Institute Structural Journal. January-February 1989, pp. 3-12. • Saatcioglu, M., Razvi S.R., 1992: Strength and Ductility of Confined Concrete. ournal of Structural Engineering. Vol. 108, no. 12, pp. 2703-23. • Sheikh, S. A., & Khoury, S. S. (1993). Confined concrete columns with stubs. ACI Structural Journal, 90, 414-414. • Sheikh, S. A., Shah, D. V., & Khoury, S. S. (1994). Confinement of high-strength concrete columns. ACI Structural journal, 91, 100-100.
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	Confined and unconfined concrete models and design
2	Accepted behavior models for hardening steel
3	Determination of concrete compressive stress distribution parameters
4	Determination of ultimate limit moment and curvature in reinforced concrete beams with girded section by considering the hardening of the reinforcement
5	Analysis of beam sections according to yield limit
6	Solution of rectangular sectioned reinforced concrete columns considering hardening effect

7	Numerical Applications
8	Bending deformations of structural elements
9	Equivalent plastic hinge length and plastic hinge rotation capacity
10	Redistribution of moments
11	Determination of plastic hinge rotations that provide design moment distribution
12	Numerical Applications
13	Numerical Applications
14	Numerical Applications