Course Title-Course Code: CE 533 FINITE ELEMENT ANALYSIS IN CIVIL ENGINEERING	Name of the Programme:CIVIL ENGINEERING

Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Field Study	H W	Other	Total	Credit	ECTS Credit
1-2	12	30	0	0	70	76	188	3	7.5

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	-
Course Contents	Introduction to finite element methods, common finite element types using in civil engineering, stiffness and forces matrix evaluations, Total potential energy approach, iso-parametric finite element, Euler and Lanrange equations, Rayleigh and Ritz method, axisymmetric problems, plate and shell analysis using finite element method, computer programming examples about finite element methods
Course Objectives	Calculate the internal forces, displacements and stress distribution of continuum volume and especially analysis of common civil engineering structures such as 2-D and 3-D truss, 2-D and 3-D frame structures, plate and shells using 4 and 3 point 2-D plane members.
Learning Outcomes and Competences	Improving the knowledge of structural analysis, numerical solutions of structural members, analysis approach of civil engineering structures
Textbook and /or References	1. Zienkiewicz , O.C., The Finite Element in Engineering Science , McGraw Hill, 3rd Edition, New York, 1977. 2. Bathe, K-J., and Wilson, E.L., Numerical Element Analysis, Prentice Hall, New Jersey, 1976. 3. Bathe, K-J., Finite Element Procedures in Engineering Prentice Hall, New Jersey 1982. 4. Hinton, E., and Owen, D.R.J., Finite Element Programming, Academic Press, London, 1977 5. Irons, B.M., and Ahmad, SV, Techniques for Finite Element, Ellis Horwood, Chichester, U.K., 1979. 6. Irons, B.M., "Engineering application of numerical integration in Stiffness method", J.A.I. A. A., Vol. 4, pp. 2035-2037, 1966. 7. Langhaar, H.L. , Energy Methods in Applied Mechanics, John Wiley, Inc., New York, 1962. 8. Richards, T.H., Energy Methods in Stress Analysis, Ellis Horwood Ltd., Chichester, England, 1977. 9. Chandrupatla, T.R., Belegundu, A..D., "Introduction to Finite Elements in Engineering", Prentice Hall International Inc. , 1997, ISBN No: 0-13-273319-6 10. S. Tanwir Wasti, Mehmet Utku, "Finite Element in Structural Analysis (Class Notes)", METU, Ankara, Turkey, 1990

Assessment Criteria		*If any,mark as (X)*	Percent (%)
	Midterm Exams	X	30
	Quizzes		
	Homeworks	X	10
	Projects		
	Term Paper	X	10
	Laboratory Work		
	Other		
	Final Exam	X	50

Instructors	Asst. Prof. Dr. Özgür ANIL

Week	Subject
1	Introduction to finite element methods,
2	Common finite element types using in civil engineering,
3	Common finite element types using in civil engineering,
4	Stiffness and forces matrix evaluations,
5	Total potential energy approach,
6	Iso-parametric finite element,
7	I.Midterm
8	Euler and Lanrange equations,
9	Rayleigh and Ritz method,
10	Rayleigh and Ritz method,
11	Axisymmetric problems
12	Axisymmetric problems,
13	Plate and shell analysis using finite element method,
14	Computer programming examples about finite element methods.