

FINITE ELEMENT METHOD

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| Instructor: | Fazıl Önder Sönmez |
| Office: | M 4215 |
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| Class hours: | Tuesdays 19.00 – 21.50, M2171 |
| Office hours: | Tuesdays 18.00-19.00, 21.50-22.10 |
| Prerequisite: | Fundamental knowledge of mechanics |
| Course Objectives: | Gaining a clear understanding of the basic concepts of FEM. Application of the finite element method to the analysis of load carrying structures. |
| Textbook: | None. Use your hand notes. As supplementary you may use the following book: Finite Element Analysis Theory and Application with ANSYS, Saeed Moaveni, Prentice Hall. |
| Grading: | Homeworks and Projects 35 % Midterm # 1 10 % Midterm # 2 20 % Final Exam 35 % |
| Notes: | Midterms and final exams are closed book and notes. Only the formula sheet is permitted. |

Tentative Course Schedule:

| <u>Week</u> | <u>Topics</u> |
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| 1-3 | Introduction (Basic ideas in finite element analysis, introduction to structural analysis, and introduction to energy methods) <i>Homework 1</i> <i>Homework 2</i> <i>Midterm I</i> |
| 4-5 | Truss Bar Elements <i>Project 1</i> |
| 6-8 | Beam and Plane Frame Elements <i>Project 2</i> <i>Midterm II</i> |
| 9-11 | Plane Stress and Plane Strain Finite Elements <i>Project 3</i> |
| 12-13 | Plate Elements in Bending |
| 13 | 3D Solid Elements <i>Project 4</i> |
| 14 | Free Vibration of Truss Bar and Beam Finite Elements <i>Final Exam</i> |