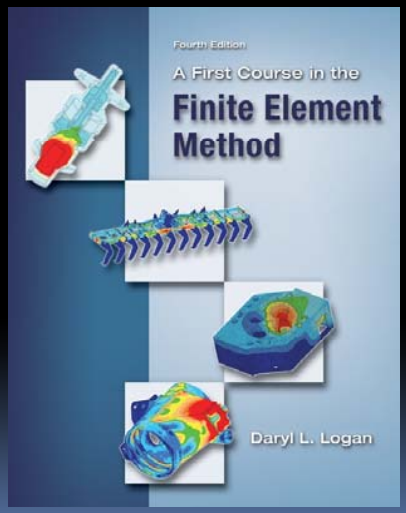
ME 455/555 *INTRO. TO FINITE ELEMENT MODELING AND ANALYSIS*

Instructor: Hormoz Zareh, PhD, Associate Professor
Mechanical Engineering Dept.
Director of MCAE laboratory
Undergraduate advisor

Office: Room 402F EB (*Phone:* 503-725-4286)
E-mail: *hormoz@me.pdx.edu*
Web: *http://web.cecs.pdx.edu/~hormoz/*

Office Hours: Mon-Wed 2:30-3:30
Tue –Thu 10-11
and by appointment

Textbook



Course syllabus (Based on textbook chapters)

Week 1: Chapter 1 Fundamental concepts, introduction to Finite Element Method
Chapter 2 Introduction to stiffness method
Chapter 3 Development of Truss Equations

Week 2: Chapter 3 Development of Truss Equations
Chapter 4 Development of Beam Equations

Week 3: Chapter 4 Development of Beam Equations
Chapter 5 Frames and grids

Course syllabus (continued)

Week 4: Chapter 6 Development of 2-D Plane Stress/Strain Equations
Chapter 10 Isoparametric Formulation

Week 5: Midterm Exam
Chapter 8 Higher Order 2-D Elements
Chapter 9 Axisymmetric Elements

Week 6: Chapter 9 Axisymmetric Elements
Chapter 11 Three-Dimensional Solids

Week 7: Chapter 16 Intro. to Vibration (Structural Dynamics)

Week 8: Chapter 13 Intro. to Heat Transfer problems

Select topics in Modeling, Post processing, Results interpretation, and Error analysis will be covered throughout the term.

Grading Policy

Grades will be based on homework assignments and exams as follows:

Homework and computer projects	20%
Midterm exam	35%*
Final exam and project	45%

* No make up exam will be given. If you miss the midterm, final exam grade will be 70% of your total grade.

Class Attendance Rules

- Class attendance is not mandatory.
- No eating during the class period.
- All mobile phones and pagers must be turned off.
  (Violators will be asked to leave the classroom for the remainder of that class period)
- Do not disrupt the class by talking to others during the lecture.
- Homework assignments are due at the beginning of the class period. Late homework will not be accepted.

Graduate Students (ME 555) project

Each graduate student needs to complete an additional project (assignment) as part of the fulfillment of their grad-level coursework requirements.

The nature of the project will be discussed later in the term. The due date for completion will be on the day of the final exam.

Course Objectives (Important concepts)

Understand fundamental concepts of Finite Element Techniques.

Will learn how to convert a physical problem description into an FE modeling problem.

Will learn how to set up the solution strategy necessary to obtain reasonable answer to the original physical problem.

[1] Will learn how to use available computer simulation software to solve FE problems.

Will learn how to interpret FE results and make sense of simulation findings.

[1] WILL NOT confuse the course with commercial software vendors' "how to" training exercise.

MCAE laboratory and FE software

MCAE laboratory: Room 420 EB

Printers: Room 423 EB

Software: **ABAQUS software is available in the lab and will be used for in-class demonstrations. However, you are free to use any available software of your choice (such as Ansys or CosmosWorks).**

Access to the labs and software: **Must obtain electronic entry to the MCAE lab with a PSU ID badge. If you don't have a PSU ID badge, be sure to arrange to get one, or check with ME dept. front desk to see how to obtain access to the lab without an ID badge.**

Student version of ABAQUS is available as a free download (max. 1000 nodes) directly from Simulia :

(http://campus.3ds.com/simulia/freese)