

ME 872-Introduction to the Finite Elements Method

Spring 2011

Instructor: A. Bénard

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Office Hours: MW 10-11:30am

Remark: I try to respond as quickly as possible to emails, if you do not receive a reply within 24 hours, please resend again (keep in mind that sometimes I cannot check email messages on weekends or while on travel).

Course Objectives

The finite elements method is a very powerful technique for solving complex problems in engineering. Numerous commercial codes are available for use by engineers and scientists, and many more specialized codes have been developed within the research community for specific purposes. A detailed understanding of the models and the numerical algorithms is essential to write/modify such codes and for the effective utilization of a commercial system. The purpose of the course is to establish a clear understanding on finite element methods and their use for the solution of problems governed by partial differential equations. We will also study some practical aspects (implementation issues) of the method and its usage in solving engineering problems.

Course Format

This course is based on the standard lecture format. We will meet three times per week on MWF 3-3:50pm in 2205EB.

Grading

The grades for this course will be based on exercises, two exams, and a final project accompanied by an oral presentation. The exercises will be handed out on a weekly basis and will count for 20% of the grade for the course. The project will also count for 20%. The exams will count for 60% of the final grade.

Exam Dates:

1st exam: February 9; 2nd exam: March 23; Project presentation: Tues. May 3 3-5pm

Textbook:

A First Course in Finite Element by J. Fish and T. Belytschko, 2007.

Resource:

An Introduction to the Finite Element Method by Reddy, third edition, 2006

Programming Language

Students will often need to solve exercises with the help of small programs. You are welcome to use Mathematica, Matlab, Maple, C++, Fortran, or Java.

Software Package

We will use two software packages during this course: Abaqus (from textbook) and Ansys.

Holidays/Break

Mon, January 17 - Martin Luther King Day - no classes

Mon-Fri, March 7-11 - Spring Break