MECH 5350: Introduction to Finite Element Method
Fall 2015

Instructor: Dr. Dong Qian, Associate Professor of Mechanical Engineering
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Schedule: MW 4:00-5:15PM

Location: CN 1.304

Office Hours: MW 1:30-2:30PM (For other times, please call to make appointments)

Teaching Assistant: Mohammad Karim, Email: mxk143830@utdallas.edu

TA Office Hour: MW 3:00-4:00PM, ECSN 3.906

Textbook: *Concepts and Applications of Finite Element Analysis* by Cook, Malkus, Plesha and Witt, 2002, 4th edition, Wiley. (This book is recommended but not required)

In-class handouts

Prerequisites: MECH 3301 (Mechanics of Materials), MECH 4301 (Intermediate Mechanics of Materials) or equivalent.

Course Description

This course will provide an introduction to the basic concepts of finite element method and the techniques used for stress analysis for mechanical systems design. Simple tutorial to the use of commercial FEM code will be provided.

Course Objectives

1. Learn the basic principles and formulations of the finite element method.
2. Solve practical engineering problems using commercial finite element code.
3. Develop the ability to write a simple 2D finite element code for analysis.
4. Understand the implication of FEM analysis results for engineering design.

Course Outline (subjected to change)

- Introduction to the concept of finite element method; review of matrix algebra and basic elasticity theory. (3)
- Bar and beam elements. Local and global stiffness equation (4)
- Energy principles, Rayleigh-Ritz Method, and interpolations. (4)
- 2D plane problems and isoparametric elements. (4)
- Finite element solution techniques (3)
- Plate and shells (2)
- 3D solid elements (2)
- Structural vibration and dynamic analysis (4)
- Computer lab sessions (3-4)

Course load:

- Homework assignments (35% of total grade). Regular homework due 1 week after day assigned. Computer homework due 2 weeks after day assigned. Late submission will not be graded.
- Midterm exam (close book, 30%)
- Final project (open book, 35%, Graduate students will be assigned with different projects that requires programming).

Course Policies

Make-up exams

No make-up exams will be given with the only exception of a serious emergency. Advanced notice must be given in such a case.

Late Work

Late work will not be graded.

Class Attendance

Students are expected to attend each class. Missing class or be late for class on a frequent base (more than 3) will receive deduction of points.

Cell phone/electronic device usage

Cell phone and any other type of electronic devices for communication must be turned off during the class. Computer and tablet can ONLY be used for the purpose of taking notes.

Email usage

Please note that all the email communications with regard to the course must be handled through your email address at UT Dallas according to the University policy.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.