MECH 4326 Finite Element Analysis

Course Syllabus

Fall 2024

Time and Location: T TR 12:00 – 1:20 , UGLC 216

Instructor: Hossein Mallahzadeh, Ph.D
E-mail: hmallahzade@utep.edu
Office hours: T 1:30 – 2:30 PM, W 10:30- 11:30
Office location: Engineering Bldg., E-329

Reference Textbooks:
"A First Course in the Finite Element Method", 6th edition, by Daryl L. Logan

Blackboard: The instructor will use Blackboard for uploading lectures, updating the syllabus (if necessary), and communicating with students via "Announcements" and email.

Required Material/Software: MATLAB
Prerequisites: MECH 3334& MECH 2351

Course Description: This 3 credit hour class is intended to provide the students with an introduction to the theory, skills, and nomenclature to confidently, and intelligently, perform linear elastic and basic dynamic finite element analysis for mechanical engineering systems and structures. This will be done with exposure to the basic theory of finite element analysis with hands-on applications solved using Matlab. This is not a class to teach you how to use a particular software.

COURSE OBJECTIVES:
At the end of this class the typical students should be well prepared in the following areas:

- Formulate assemble and solve simple finite element problems by hand
- Understand the finite element interpolation and how it is used to model elasticity problems
- Understand the formulation of the following finite elements: bar, truss, beam, CST, LST and Quad4 2D elements, solid and shell elements
- Understand how various finite elements converge and how to test for the convergence
- Understand the basic elasticity partial differential equations and the 2D simplifications of plane stress, plane strain and axisymmetric
- How to choose appropriate boundary conditions
- Modeling errors and basic element deficiencies

Exams: There are 3 midterm exams. Makeup exams are not given under any circumstances.

Exam dates: 9/24, 10/22 and 11/20

Project: There will be a project given in the semester. This project is of such a scope that it will take a few weeks to complete. Typically, they will involve using FEA as a design tool and then involve design iteration.

Grading

Your final grade for this course will be based on the following activities

Assignment	Percentage
Midterms	75%
Project	25%
Total	100%

Grade Scale	
100-90%	**A**
89-80%	**B**
79-70%	**C**
69-60%	**D**
<60%	**F**

The instructor reserves the right to revise this grading plan.
NO extensions are given in homework or quizzes.