MECH 4326 Finite Element Analysis
Course Syllabus
Spring 2023

**Time and Location:** TR 12:00 – 1:20, Classroom Building C205

**Instructor:** Hossein Mallahzadeh, Ph.D

E-mail: hmallahzade@utep.edu

Office hours: T 1:00 – 2:00 PM, W 1:00- 2:00 PM

Office location: Engineering Bldg., E-329

**Reference Textbooks:**


**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

**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 three midterm exams.

**Exam dates:** February 14th, March 21st, April 18th.

**Grading**

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

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Midterm Exams (3x)</td>
<td>75%</td>
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<tr>
<td>Project</td>
<td>25%</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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<table>
<thead>
<tr>
<th>Grade Scale</th>
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<tbody>
<tr>
<td>100-90%</td>
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<td>89-80%</td>
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<td>79-70%</td>
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<td>69-60%</td>
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<td>&lt;60%</td>
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The instructor reserves the right to revise this grading plan.

**NO extensions are given in homework or quizzes.**

**Exams:** Under any circumstances makeup exams are not given. **Electronic devices (e.g. laptops, tablets, cell phones, etc.) are not permitted,** only calculators. **NO formula sheets are allowed, NO headphones or earphones.** Be sure to use the bathroom before the exam, you will **NOT** be permitted to leave during the exam. Show your student ID on top of your desk.

The instructor preserves the right to ask for explanation of the student’s exam answers.