

Department: Civil Engineering
Number: CE 5307
Title: Theory of Finite Element Analysis

Instructor: Cesar Carrasco Ph.D.
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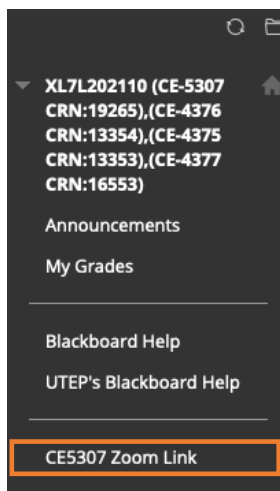
Catalog Description: Finite elements of structural mechanics problems, virtual work principle, plane trusses and frames, axial elements, beam bending, plane stress and plane strain, axisymmetric stress analysis, three-dimensional stress analysis, isoparametric finite elements, finite element computer project, and use of several finite element software to solve typical problems.

Prerequisite: Instructor approval

Textbook: Fundamental Finite Element Analysis and Applications: with Mathematica and Matlab Computations, M. Asghar Bhatti, Wiley 2005

Software: Students should have Matlab installed in their laptops to be used during class

Course Delivery Format: This semester's course will be offered synchronously online. This means that we will be meeting every Tuesday and Thursday from 1:30 to 2:50 pm using the Zoom platform. To login students can use the link with the title "CE5307 Zoom Link" (see image below) in Black Board on the left tool bar or just click on the Zoom link given below. All Zoom sessions will be recorded and uploaded to Black Board. The purpose of uploading the sessions is not to allow students to willfully skip them but rather to assist those that for any reason cannot attend a particular session(s) either because of technical problems (i.e. internet access) or any other personal reason. Skipping too many sessions will make it difficult to catch up even if they are available in Black Board.



Join Zoom Meeting

<https://utep-edu.zoom.us/j/83906616721?pwd=NjR5RjRVbStVckdLdStGZDI3S3Q5UT09>

Meeting ID: 839 0661 6721

Passcode: 6s360w

Course Objectives: This course seeks to familiarize the student with the theory of the finite element method of analysis. At the end of the course the student should be able to formulate the finite element representation of truss, beam and isoparametric elements. The student should be able to apply the finite element method to the analysis of 2D and 3D trusses and frames as well as the analysis of plane stress and plane strain problems. At the end of the course the student will have developed a finite element code for the analysis of plane strain and plane stress problems using the isoparametric formulation.

Topics Covered:

1. Fundamental concepts.
2. Two and three-dimensional truss elements.
3. Two and three-dimensional beam elements.
4. Formulation techniques.
5. Isoparametric elements and basic programming concepts.
6. Plane stress and plane strain elements.
7. Finite element programming.

Grades:

Your grade for this course will be assessed based on your performance in mid-term exams and projects (60%), homework and quizzes (10%) and final project (30%). There will be no final exam.