Catalog Description: Theory of finite element approximation, numerical solutions of a variety of problems in structural mechanics including beam-columns, grid beams and plates on linear and nonlinear foundations, and matrix structural analysis.

Prerequisite: CE 3343 and department approval.

Textbook: Course notes provided by instructor

Course Objectives: This course seeks to familiarize the student with the use of advanced structural analysis methods. The course is a continuation to the CE3343-Structural Analysis I undergraduate course. At the end of this course the student should be able to use the direct stiffness (matrix) method to analyze trusses and frames in the 2D and 3D space. In addition, the student will learn to analyze beams and planes on linear and non-linear foundations. The student will also learn to use commercial 3D modeling software to analyze trusses and frames including floor systems and shear walls.

Topics Covered (numbers in parenthesis indicate programmatic outcomes addressed):
1. Review of basic structural analysis (1).
2. Review of linear algebra (1).
3. Introduction to the direct stiffness method (2D Trusses) (1).
4. Analysis of 2D frames using the direct-stiffness method (1).
5. Analysis of space trusses and 3D frames using the direct-stiffness method (1).
6. Beams on elastic foundation (1).
7. Beams and plates on nonlinear foundation (1).
8. Computer modeling of 2D and 3D structures (1).

Class Schedule: TR 4:30 – 5:50 p.m

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