

Course and Instructor Information

Course Title: CE 5164

Credits: 3

Format: Fully Online (at huskyct)

Prerequisites: Not open for credit to students who have passed CE 5162

Instructor: Jeongho Kim

Course Description

Formulation of finite element methods for linear static analysis. Development of two and three dimensional continuum elements, axisymmetric elements, plate and shell elements, and heat transfer elements. Evaluation of basic modeling principles including convergence and element distortion. Applications using commercial finite element programs.

Course Objectives

By the end of the semester, students should be able to:

1. Derive the stiffness matrix for bar, beam, plate and two-dimensional continuum elements.
2. Set up a finite element model and perform analysis of linear-elastic solid mechanics problems using commercial software.
3. Interpret finite element analysis results such as displacements, strains and stresses.

Course Outline (schedule may change)

Module 1: Introduction to finite element methods & a bar element
Module 2: Principles of Minimum Potential Energy
Module 3: Thin Beam and Thick Beam Formulations
Module 4: Continuum Element Formations
Module 5: Isoparametric Formulations
Module 6: Triangular Elements
Module 7: Stress Recovery and Error Estimation
Module 8: Shell Elements
Module 9: Heat Conduction
Module 10: Mid-Term Exam
Module 11: Buckling Analysis
Module 12: Work on Final Project
Module 13: Thanksgiving Break
Module 14: Continue Working on Final Project and Presentations
Module 15 & 16: Presentation & Submit Final Paper

Course Materials: No Textbook Required