

MECH3380 - Introduction to Computational Design and Analysis

[MECH 3380](#) Introduction to Computational Design and Analysis (3 semester credit hours) This course covers analytical and computer-based methods to design and analyze engineering structures. The course builds on prerequisite knowledge in mechanical engineering design, mechanics of materials, physics, engineering mathematics, and computer programming. The scope includes fundamentals of product design requirements, evaluation of stress and deformations in solids with complex geometries, and manufacturing process considerations. The course introduces 1-D boundary value problems, numerical solution methods (finite element analysis), and various computational tools to assess failure criteria. Additional topics include identifying linear vs. nonlinear structural problems, function approximation tools to reduce simulation time, and design optimization techniques. Computer programming and computer-based solid modeling/analysis tools are integrated into the course to facilitate the design and evaluation of complex, real-world problems. Prerequisites: [CS 1325](#) and [MATH 2420](#) and [MECH 2320](#) and [MECH 3305](#) or equivalents. (3-0) Y