- **Course Number and Title:** M E 460. Applied Finite Elements
  M E 518 Finite Element Analysis

- **Catalog Description:** Introduction to the practical aspects of structural finite element modeling. Course focuses on providing a working knowledge of how to effectively incorporate finite element techniques into the design process.

- **Credit Hours:** 3 Credits (3)

- **Prerequisite(s) / Corequisite(s)** Prerequisite(s): M E 425
  Corequisite(s): None

- **Required:** Elective for BSME or BSAE Degree

- **Course Availability:** Fall Semester

- **Instructor (Usual):** Dr. Borys Drach (See https://mae.nmsu.edu/people/faculty.html)

- **Textbook:** Daryl L. Logan "A First Course in the Finite Element Method" 6th Edition, CL Engineering (Cengage Learning) ISBN-10: 1305635116, ISBN-13: 978-1305635111.

- **Course Learning Objectives:** <u>After completing this course, a student should be able to:</u>
  1) Use direct stiffness and potential energy approaches to assemble global system of linear equations for static elastic and steady state heat transfer problems (bar, beam, plane stress/strain elements).
  2) Solve the global system of linear equations for unknown degrees of freedom (displacements or temperatures).
  3) Postprocess the solution to find stresses, strains, or temperature gradients.
  4) Solve two-dimensional and three-dimensional problems of elasticity and heat transfer using commercial general purpose finite element analysis software.

- **Topics Covered:** Introduction to the Stiffness (Displacement) Method, Direct and Potential Energy approaches; Bar and truss elements; Beam elements; Plane strain and plane stress equations; Two-dimensional constant strain element; Scalar field problems, Heat transfer; Structural dynamics and time-dependent heat transfer