

- Course Number and Title: A E 363. Aerospace Structures
- Catalog Description: Advanced concepts of stress and strain, introduction to the analysis of aero structures, complex bending and torsion, thin walled sections and shells, computational techniques.
- Credit Hours: 3 Credits (3)
- Prerequisite(s) / Corequisite(s): Prerequisite(s): C E 301
Corequisite(s): None
- Required: Required for BSAE Degree
- Course Availability: Spring Semester Only
- Instructor (Usual): Dr. Young S. Lee (See <https://mae.nmsu.edu/people/faculty.html>)
- Textbook:
 1. Donaldson, B. K., Analysis of Aircraft Structures—An Introduction (Chapters 1-14), 2nd Ed., Cambridge Aerospace Series, 2008
 2. J. Cutler, Understanding Aircraft Structures—See Canvas and also NMSU Electronic Book service (<http://www.netlibrary.com/>)
- Course Learning Objectives: After completing this course, a student should be able to:
 - 1) Formulate and solve some fundamental linearly-elastic problems;
 - 2) Apply basic failure theory and perform thermal shock analysis for composite materials;
 - 3) Perform simplified dynamic loading analysis on aerospace structures;
 - 4) Calculate various area properties for nonhomogeneous cross-sections of a beam, and their principal values and directions;
 - 5) Understand the formulations of stresses / strains / deflections in a beam under various loading and boundary conditions.
- Topics Covered:
 - Fundamental theory of elasticity (stress-strain relations through linearly elastic material behavior, and structural deformation under compatibility conditions);
 - Simplified failure analysis of composite materials;
 - Dynamic loading analysis (fatigue / impact design);
 - Thermal shock analysis;
 - Plastic deformations and residual stresses
 - Stresses, strains and deflections in a beam with closed / open, homogeneous/nonhomogeneous cross-sections under various (longitudinal / transverse, bending, torsional, buckling) loading/boundary conditions