

1. **Course Number and Name:** SE 160B: Aerospace Structural Mechanics II
2. **Credit and Contact Hours:** 4 hours of classroom instruction per week.
3. **Instructor:** John B. Kosmatka
4. **Textbook:**
 - Kosmatka, J.B.; Aerospace Structural Mechanics (Course notes for SE-160A, Volume I and II), UCSD Book Store, 2012.
 - Kosmatka, J.B.; Aerospace Structural Mechanics (Course notes for SE-160B, Volume III), UCSD Book Store, 2012.
 - Kosmatka, J.B.; Aerospace Structural Mechanics - Appendices, UCSD Book Store, 200
5. **Specific Course Information:**
 - a. **Catalog Description:** Analysis of aerospace structures via work-energy principles and finite element analysis. Bending of metallic and laminated composite plates and shells. Static vibration and buckling analysis of simple and built-up aircraft structures. Introduction to wing divergence and flutter, fastener analysis.
 - b. **Prerequisites:** SE 160A. Enrollment restricted to MC25, MC27, and SE27 majors only.
 - c. **Selected Elective Course**
6. **Course Objective:**
 - To teach students methods for analyzing the behavior of metallic and composite plate and shell aerospace structural components.
 - To teach students energy-based procedures for analyzing the behavior of thin-wall aerospace structural components.
 - To teach students modern computational procedures (finite element) and programs to analyze modern composite stiffened thin-wall aerospace structures.
 - To teach students techniques for designing and analyzing structures that require fasteners and/or bonded joints.
7. **List of Topics to be Covered:**
 - Stretching and bending behavior of metallic and composite plates
 - Failure of laminated composite plates
 - Energy principles in structural analysis (Castigliano's 1st and 2nd theorems)
 - Introduction to the finite element method. Formulation of bar, beam, and plate elements
 - Static, vibration, and buckling analysis of simple and built-up aerospace structures using a commercial finite element code (MSC NASTRAN)
 - Advanced Topics (one or more of the following depending upon available time): structural dynamics, structural stability including buckling and aircraft wing flutter (aeroelasticity), and/or structural optimization
 - Analysis for bonded and fastened (bolts, rivets) connections

Person Who Prepared This Description and Date of Preparation

John B. Kosmatka, 3/18/2025