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, 2006.
5. **Specific Course Information:**
   a. **Catalog Description:** Work-energy principles, statically indeterminate structures, matrix methods, application of finite element method to aerospace structures, sandwich composite structures, structural dynamics of space structures, structural stability of beams, and shells, tension field beams, wing divergence and control reversal, flutter, fasteners, and structural joints.
   a. **Prerequisites:** SE 160A
   b. **Selected Elective** Course
6. **Specific Goals for the Course:**

Letters in parentheses relate to the department's student outcomes

- To teach students methods for analyzing the behavior of metallic and composite plate and shell aerospace structural components (a, b, c, e, g, i, j, k, AE12, AE13, AE14).
- To teach students energy-based procedures for analyzing the behavior of thin-wall aerospace structural components (a, b, c, e, g, k, AE12, AE13, AE14).
- To teach students modern computational procedures (finite element) and programs to analyze modern composite stiffened thin-wall aerospace structures (a, b, c, e, g, h, i, j, k, AE12, AE13, AE14).
- To teach students techniques for designing and analyzing structures that require fasteners and/or bonded joints (a, b, c, e, g, i, j, k, AE12, AE13, AE14).

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, 9/5/2012