THE DEPARTMENT OF AERONAUTICS AND ASTRONAUTICS

AA 332 AEROSPACE STRUCTURES II

SPRING QUARTER

**CREDITS AND
CONTACT HOURS**: 4 credits, Four 50-minute lectures per week.

COORDINATOR: Kuen Y. Lin, Professor of Aeronautics and Astronautics

TEXTBOOK: Advanced Strength and Applied Stress Analysis, 2nd ed, Budynas, R.G., McGraw-Hill 1999

**SUPPLEMENTAL
MATERIALS**:
1. Aerospace Structural Analysis", Allen & Haisler, John Wiley & Sons.1985
2. Aircraft Structures," 2nd ed., .Peery, D.J. & Azar, J.J McGraw-Hill 1982
3. Analysis of Aircraft Structures", Donaldson, B. K., Cambridge U Press, 2012
4. Advanced Strength for Engineering Students, 3rd Edition, THG Megson, John Wiley & Sons, 1999

CATALOG DATA: AEROSPACE STRUCTURES II**,** Required
Bending of plates and shells. Buckling analysis. Energy principlesand minimum potential energy. Introduction to the finite element method. Airworthiness and airframe loads. Strength and damage   characteristics of ductile, brittle and composite materials.   Elements of   fracture mechanics and fatigue. Prerequisite: AA 331 with a minimum grade of 1.7. Offered: Sp.

PREREQUISITES BY TOPIC: Structures

OUTCOMES:
1) Students will be able to analyze shear flow in practical aerospace structures.
2) Students will be able to calculate buckling loads for beams and plates.
3) Students will be able to understand Principle of Minimum Potential Energy and apply the theorem to solve a variety of structural problems.
4) Students will be able to derive finite element equations for truss and beams.

RELATIONSHIP TO STUDENT OUTCOMES:
a) An ability to apply knowledge of strength of materials and material science.
e) An ability to identify, formulate, and solve engineering problems
k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

TOPICS:
1. The bending of plates and shells.
2. Buckling analysis for thin structures in compression.
3. Energy principles in linear elasticity: minimum potential energy.

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4. Introduction to the finite element method.
5. Strength and damage characteristics of ductile and brittle metals.
6. Strength and general nature of composite materials.
7. Elements of fracture mechanics and fatigue.