San José State University
Aerospace Engineering
AE 114 Aerospace Engineering Structural Analysis II, Spring 2016

Course and Contact Information

Instructor:	Dr. P. Boylan-Ashraf
Office Location:	E 272B
Email:	peggy.boylan-ashraf@sjsu.edu
Website:	www.boylanashraf.com
Office Hours:	TBA
Class Days/Time:	TBA
Classroom:	E164
Prerequisites:	Grade of C- or better in MatE25: *Introduction to Materials* Grade of C- or better in AE112: *Aerospace Engineering Structural Analysis I*

Course Description

The course emphasizes on basic structural theory and the application of the elementary principles of mechanics to the analysis of aircraft structures.

Course Goals

1. To deepen the learner's knowledge of fundamental concepts of elasticity and statically indeterminate structures.
2. To introduce the learner of axial deformation, torsional angle of twist, and bending deflection.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

1. Determine tensile and compressive members of a spacecraft truss structures using both method of joints and method of sections.
2. Calculate principal stresses and principal strains using transformation equations and Mohr's Circle of beam-column type wing and fuselage structures.
3. Calculate aircraft material specimen displacements due to thermal affects.
4. Analyze statically indeterminate axially-loaded aircraft assemblies and determine tensile and compressive elements.
5. Calculate deformations in axially-loaded wing assemblies.
6. Calculate stresses in thin-walled monocoque and semi-monocoque structures.
7. Analyze statically indeterminate torsional shafts and determine angle of twist.
8. Draw shear force and bending moment diagrams of fuselage beam structures.

9. Examine combined (axial, torsional, and bending) fuselage loading and analyze principal stresses.
10. Calculate bending deflection in wing and fuselage beam structures using integration and superposition methods.

Required Texts/Readings

Textbook

David J. Peery: Aircraft Structures. ISBN 10: 0486485803.

Notes from Professor

Course Requirements and Assignments

Assignment

There will be 2-4 problems assigned as assignment each week (see Assignment Schedule under the Syllabus tab in Canvas). Please submit these problems before their deadline. Late assignment will not be accepted or will result in very little partial credit. All assignment must be submitted in PDF format via Dropbox. No paper assignment will be accepted. Assignment is worth 12% of your final course grade. While a correct answer is the goal of any problem solution, the teaching team (your professor and teaching assistants) is most interested in the path that you take to obtain the solution. When grading your assignment, it is very important that all of your work is clearly described in your solution. In the case of an incorrect final answer, this can help the teaching team determine where the conceptual or computational error is in the solution. The important elements of a good problem-solving technique are:

1. Correct problem set-up.
2. Correct analysis.
3. Correct numbers and units.
4. Correct interpretation of the answer (both units and direction).

These are the elements that earn major credit.

Extra Credit

From time to time I will assign extra credits during lecture. Each extra credit is worth 1 point. No partial credit shall be awarded for extra-credits.

Final Examination or Evaluation

There are 4 exams (Exams 1, 2, 3, and the Final Exam) scattered throughout the semester. Make-up exams will be given only for very unusual circumstances and/or approved medical excuses. For anticipated conflicts with a scheduled exam, you must contact your professor before the exam to try to arrange an alternate exam. All requests for make-up exams must be submitted in writing (via email) and must include the reason for the request and a copy of your schedule of classes this semester.

Grading Information

Exam 1	22%
Exam 2	22%
Exam 3	22%
Final Exam	22%
Assignment	12%

Determination of Grades

A	> 91%	C+	> 75%
A-	> 88%	C	> 70%
B+	> 85%	C-	> 68%
B	> 80%	D+	> 65%
B-	> 78%	F	< 60%

Note: Neatness and completeness count! Analysis that cannot be understood, interpreted, or checked by others is of little or no value. For all work that is submitted for grading, if part of the work is missing, or if the work is incomplete; or if the work cannot be read; or if the work cannot be understood, you will get little or no partial credit.

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University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/.

AE Department and SJSU policies are also posted at http://ae.sjsu.edu/program-policies.

AE 114 Aerospace Engineering Structural Analysis II, Spring 2016 Course Schedule

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1		Introduction and Review of AE 112
2		Truss Structures
3		Truss Structures Exam 1
4		Strain Transformation Equations and Principal Strains
5		Strain Gauge Rosettes and Thermal Strains
6		Axial Loading, Deformation Exam 2
7		Statically Indeterminate Axial Loading

Week	Date	Topics, Readings, Assignments, Deadlines
8		Joint and Fittings and Idealized Thin-Walled Structures
9		SPRING BREAK
10		Torsion, Angle of Twist, and Shear Loading
11		Statically Indeterminate Torsion Exam 3
12		Combined Axial and Torsional Loading
13		Beam Bending
14		General Combined Loading (Axial, Torsional, and Bending)
15		Deflection of Structures
16		Reflection and Review