AEM 341 Aerospace Structures
Spring 2018
Time: MWF 11:00 - 11:50 am
Location: SERC 2009

Objectives: Lightweight, robust, cost-effective structures are critical for high performance aerospace systems. In this course, we will study methods for analyzing advanced beam and stressed skin structures typical of aerospace vehicles. We will become familiar with the nomenclature, structural mechanics concepts, and loads seen in aerospace vehicles.

Professor: Dr. Charles O'Neill, AEM, 222 Hardaway
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Office Hours: Open door policy or by appointment.

Class Website: http://charles-oneill.com/aem341/

Required Book: *Introduction to Aerospace Structural Analysis*, Allen & Haisler, Wiley.

ISBN 0-471-88839-7

Goals:

By the end of the course, students should be able to:

- Understand structural terminology, nomenclature, and aerospace structural elements.
- Demonstrate basic static and accelerated loads concepts and estimates.
- Determine principle stresses and principle directions
- Demonstrate structural analysis of advanced beams and cells in bending and torsion
- Demonstrate analysis of shear and shear flow
- Analyze, design and test an aerospace structure as a term project
- Fluently converse with loads and stress teams in a design setting

Topics:
We will cover the following topics in the textbook and selected topics from sources supplementing the text.

- Mechanics of Aerospace Structures
- Constitution of Aerospace Materials
- Theory and Analysis of Aerospace Beams
- Work and Energy Principles
- Aerodynamic and Inertial Loads including Operational Envelopes

Additional Resources and References:

You may wish to consult or browse the following resources for additional insight. These are completely optional.

- *Aircraft Structures*, Peery. 1950s.
- *Theory and Analysis of Flight Structures*, Rivello.
- *Aircraft Structures for Engineering Students*, Megson.

Grades:
Your final score is the sum of 3 exams, 1 project, and homework for a total of 500 pts. The guaranteed-maximum letter grade cutoffs are:

Grade	Score
A+	97
A	93
A-	90

Grade	Score
B+	87
B	83
B-	80

Grade	Score
C+	77
C	73
C-	70

Grade	Score
D+	67
D	63
D-	60

Homework Policy:
We will be assigned homework. Reference solutions will be posted. You are encouraged to discuss your solutions with colleagues and the instructor. Homework grades for a given week will either be one randomly selected problem from the assignment **or** an in-class quiz.

Exam and Assignment Schedule:

- Two equally weighted [100 pt] midterm exams (tentative: 5th week, 10th week)
- One [100 pt] final exam (16th week)
- One structural analysis and testing project [100 pts total]
- Weekly homework/quiz, drop lowest 2 scores [100 pts total]

Extra Credit:
The instructor may provide extra credit opportunities to the entire class based on course interests, student questions, and current topics.

Email:
Your email is welcome. Please place "*AEM 341"* in the subject line to ensure your email is immediately noticed (i.e. AEM 341 emails automatically move to a special folder) among the chaff of modern communications.

Attendance:
Students are strongly encouraged to participate in class. Please interrupt the lecture to ask questions. Formal attendance records are never kept.

Missed/Late Coursework:
Late work is graded at a step discount of 25% per week. Inform me ASAP if your job (e.g. military, industry, off-campus research, etc.) has unpredictable schedules or out-of-contact duties. I **will** work with you.

Additional University Policies:
For a comprehensive list of University policies (e.g. Disability, Pregnancy, Severe Weather, etc.), visit the AEM 341 page at http://syllabi.ua.edu

Syllabus Modifications:
Every feasible effort will be taken to follow this syllabus. In the event of changes or corrections, the entire class will be notified immediately via email.