

EAS 4200C Aerospace Structures, Fall 2018
MWF 8th Period (3:00 - 3:50 pm), WEIL 270

1. **Catalog Description:** Credits: 3; Review of plane states of stress and strain. Includes analysis of thin-walled beams with open and closed section, unsymmetrical bending of wing sections, torsion of skin-stringer and multi-cell sections, flexural shear in open and closed sections, Shear Center and failure criteria. Also includes introduction to composite materials and demonstration of behavior of some simple structural elements.
2. **Pre-requisites:** EGM 3520.
3. **Course Objectives:** Upon completion of this course, students will demonstrate:
 - a) Knowledge of modern aerospace structural materials and their selection for various aircraft components;
 - b) Ability to use engineering science tools such as advanced mathematics, stress analysis;
 - c) Ability to perform stress and deformation analysis on common structural forms found on aerospace structures;
 - d) Knowledge of failure criteria for engineering materials;
 - e) Ability to design simple aerospace structures to support mechanical loads.
4. **Instructor:** B.V. Sankar, Professor
Department of Mechanical and Aerospace Engineering
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Instructor Office Hours: MWF 4 (10:30-11:45 AM)
5. **Teaching Assistants:** TBA
6. **Meeting Times:** MWF 3-3:50 pm (8th Period)
7. **Class/Laboratory Schedule/Homepage:** During assigned meetings times
8. **Meeting Location:** WEIL 270
9. **Material and Supply Fees:** None
10. **Textbooks and Software Required:** Textbook: *None. Notes will be posted*
11. **Recommended Reading:**

Mechanics of Aircraft Structures, C.T. Sun, John Wiley & Sons, 2nd Edition, 2006

Aircraft Structures for Engineering Students, T.H.G. Megson, Butterworth, 5th Edition

Introduction to Aerospace Structural Analysis, D.H. Allen and W. Haisler

Advanced Mechanics of Materials, A.P. Boresi and R.J. Schmidt, 6th Edition, John Wiley, 2003, ISBN 0-471-43881-2

12. Course Outline:

Topics

- Introduction
- Introduction to elasticity
- Torsion and bending of beams
- Analysis and design of thin-walled beams
- Failure, fracture and fatigue of materials
- Buckling
- Materials for aerospace structures

Schedule given at the end

13. Attendance and Expectations:

Even though attendance is not required, it is extremely important that students attend the class regularly. Irregular attendance always results in poor or mediocre performance. The instructor may at times give an in-class problem (quiz) which counts as part of the homework.

Re-grading Policy: Any re-grade requests must be submitted in writing within two days after return of the graded paper. The written request must explain in detail what you want the grader to do and where you believe s/he has made a mistake in grading. These requests will be accepted by Dr. Sankar only. The request must have a date on the top of the page, your name, and e-mail address.

14. Grading:

Homework	10%
Quizzes (5)	30%
Projects	5%
Midterm Exams (3)	55%
Final Exam* (optional)	-

One quiz and two HWs and will be dropped. Quizzes and exams are closed book except one 8.5×11-inch formula sheet written both sides will be allowed.

***Caution:** The fourth and final exam on Monday December 10th is optional for those who want to improve their grades. In that case, the fourth exam grade will **replace** the lowest score of the first three exams irrespective of whether the score in the 4th exam is greater or less than the minimum of the first three.

Exam and quiz dates:

Date	Sep 5	Sep 19	Sep 26	Oct 10	Oct 24	Oct 31	Nov 14	Nov 28	Dec 3	Dec 10
Quiz	1	2	-	3	4	-	5	6	-	-
Exam	-	-	1	-	-	2	-	-	3	4

15. Grading Scale:

A = 93, A- = 90, B+ = 87, B = 83, B- = 80, C+ = 77, C = 73, C- = 70, D+ = 67, D = 63, D- = 60

16. Make-up Exam Policy: There will be no make-up exams or make-up quizzes. Unless there is a **documentable extreme medical emergency**, no credit will be given for a missed exam. If one misses an exam due to a documentable legitimate reason, then they can use the 4th exam as the makeup exam. It is the student's responsibility to make sure he/she is available to take the exam. Midterm exams will be given during the scheduled class times. Late homework will not be accepted. Two of the homework assignments and one quiz will be dropped.

17. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

18. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

19. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling
- SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling

20. Software Use – All faculty members, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

EAS 4200 Aerospace Structures • Course Schedule and Assignments • Fall 2018

Lecture	Date	Day	Topic	HW/Quiz/Exam
1	22-Aug	WED	1. Introduction	
2	24-Aug	FRI	1. Introduction	
3	27-Aug	MON	1. Introduction	
4	29-Aug	WED	2. Theory of Elasticity	HW01
5	31-Aug	FRI	2. Theory of Elasticity	
-	3-Sep	MON	Labor Day	Holiday
6	5-Sep	WED	2. Theory of Elasticity	Quiz 1
7	7-Sep	FRI	2. Theory of Elasticity	
8	10-Sep	MON	2. Theory of Elasticity	
9	12-Sep	WED	3. Advanced Beams	HW02
10	14-Sep	FRI	3. Advanced Beams	
11	17-Sep	MON	3. Advanced Beams	
12	19-Sep	WED	3. Advanced Beams	Quiz 2, HW03
13	21-Sep	FRI	3. Advanced Beams	
14	24-Sep	MON	3. Advanced Beams	
-	26-Sep	WED	Exam 1	Exam 1
15	28-Sep	FRI	4. Torsion and Flexural Shear	
16	1-Oct	MON	4. Torsion and Flexural Shear	
17	3-Oct	WED	4. Torsion and Flexural Shear	HW04
18	5-Oct	FRI	4. Torsion and Flexural Shear	
19	8-Oct	MON	4. Torsion and Flexural Shear	
20	10-Oct	WED	4. Torsion and Flexural Shear	Quiz 3, HW05
-	12-Oct	FRI	Homecoming	No Class
21	15-Oct	MON	4. Torsion and Flexural Shear	
22	17-Oct	WED	4. Torsion and Flexural Shear	HW06
23	19-Oct	FRI	5. Failure, Fatigue and Fracture	
24	22-Oct	MON	5. Failure, Fatigue and Fracture	
25	24-Oct	WED	5. Failure, Fatigue and Fracture	Quiz 4, HW07
26	26-Oct	FRI	5. Failure, Fatigue and Fracture	
27	29-Oct	MON	5. Failure, Fatigue and Fracture	HW08
-	31-Oct	WED	Exam 2	Exam 2
28	2-Nov	FRI	5. Failure, Fatigue and Fracture	
29	5-Nov	MON	5. Failure, Fatigue and Fracture	
30	7-Nov	WED	5. Failure, Fatigue and Fracture	HW09
31	9-Nov	FRI	6. Buckling	
-	12-Nov	MON	Veterans Day	Holiday
32	14-Nov	WED	6. Buckling	Quiz 5, HW10
33	16-Nov	FRI	6. Buckling	

34	19-Nov	MON	6. Buckling	
-	21-Nov	WED	Thanksgiving	Holiday
-	23-Nov	FRI	Thanksgiving	Holiday
35	26-Nov	MON	6. buckling	
36	28-Nov	WED	7. Aerospace Materials	Quiz 6, HW12
37	30-Nov	FRI	7. Aerospace Materials	
-	3-Dec	MON	7. Aerospace Materials	EXAM 3
38	5-Dec	WED	Review	HW 13
	10-Dec	MON	Exam 4 optional (Weil 270)	10 AM - 11 AM