Class Sites:

Lecture – 2202 Howe, M 4:10 - 5 (all sections)

Laboratory – 0257 Howe. Meet on Tuesday (Section 2: 2:10-4, Section 3: 12:10-2) or Thursday (Section 1: 2:10-4, Section 4: 12:10-2) of the weeks as listed in the Schedule below

Pre/Co-requisite: Aer E 321

Website: http://thermal.cnde.iastate.edu/aere322

Teaching Staff:

Instructor – C. Thomas Chiou, cchiou@iastate.edu

Teaching assistants – Jared Taylor (Section 1), jaredtay@iastate.edu ; John Nagel (2), jnagel@iastate.edu; Youngdoo Kim (3&4), doo@iastate.edu

Office Hours:

Chiou - 2361 Howe MWF 12-1; Taylor – 0241 Howe TH 4-5; Nagel – 0257 Howe W 3-4;
Kim – 2332 Howe TU 4-5 or by appointment

Laboratory Work and Reports and Homework:

Laboratory work are carried out in groups of 3-4 students. Every group member must be present and bring his/her *worked* pre-lab to the lab. The students will be asked to show their work in terms of worksheets, notes, etc. at the end of lab session. Each group is required to submit one report or summary for each laboratory experiment. **Unless stated otherwise, the report/summary will be due online the Friday in the following week (after all sections complete the lab) for Thursday sections and the following Tuesday (after Thursday sections are due) for Tuesday sections**. See Schedule below for lab dates.

Many lab reports and homework heavily involve computer programming assignments for which MATLAB, Java, Python, C/C++, Fortran, etc. are the recommended languages. If a student is new to computer programming, a help file for accessing MATLAB is available in class web site. For further assistance, please contact the teaching staff.

Pre-lab and homework must be individually worked. Plagiarism and academic dishonesty will not be tolerated.

Grading:

Pre-lab (individual) 15%,
Report (group) 40%,
Homework (individual): 25%,
In-class quiz/work (individual): 20%

Individual weighting factor will be applied to each pre-lab, homework, quiz and report. Based on lab TA evaluations and the Work Assignments section in lab reports, a multiplicative factor is to be generated for each student in determining his/her final grade. The following grade scale will be used, but the final grade may be adjusted or rescaled at instructor's discretion.

Letter Grade	Percentage	Letter Grade	Percentage
A	>93%	C	>74%,=<77%
A-	>90%,=<93%	C-	>70%,=<74%
B+	>87%,=<90%	D+	>67%,=<70%
B	>84%,=<87%	D	>64%,=<67%
B-	>80%,=<84%	D-	>60%,=<64%
C+	>77%,=<80%	F	=<60%

References:

- T.H.G. Megson, Aircraft Structures for Engineering Students 5e, 2012
- D. J. Peery, Aircraft Structures, 1950 (Dover reprint)
- A. Kassimali, Matrix Analysis of Structures 2e, 2012
- AerE 321 and EM 324 textbooks and class notes
- Other supplemental materials provided on lab basis

Safety:

As in any laboratory environment, safety MUST come first. **Please do not wear open-toed shoes to the lab. Each student MUST also bring his/her own safety glasses to the lab.** Safety glasses are available for purchase in the bookstore and also from a vending machine on the first floor of Hoover. **Each student MUST also take the following online safety training courses, and bring hardcopies of the certificates to the first lab session:**

1. *Personal Protective Equipment*
2. *Laboratory Safety: Core Concepts*
3. *Shop Safety Fundamentals - Basic Procedures and Policies*
4. *Fire Safety and Fire Extinguisher Training*

To take these courses, use web browser like Firefox, Chrome or Edge to access EH&S Learning Center at https://training.ehs.iastate.edu/IOWASU/Programs/Standard/Control/elmLearner.wml.
Set web browser to accept cookies and popups then sign in using your own ISU Net-ID and password. Once login, on the menu on the top left, click on Course Catalog to display available courses. Scroll down to Environmental Health and Safety folder and click open if not already. Find the courses you need to take and click Launch. The online course will pop up in a few seconds in a separate window. One can also use Search Course Catalog to search for the courses: clicking the catalog drop-down box, select Environmental Health and Safety and then type in the Name of the class in the keyword box and click Search button. Make sure sign up for the online class that can be taken right away and not the Classroom class that will be done at a future time. If a student has already taken these classes, then he/she can re-print the certificates from My Reports also under My Menu on the left.

Each lab will start with a safety briefing. Please pay attention!

Attendance:

Attendance in the laboratory work is mandatory. If a student misses a particular laboratory session due to an extenuating circumstance, he/she can make up for that laboratory work by attending another lab section during the same lab cycle. Consideration for makeups on lab work, prelab and report will only be given to those extenuating circumstances such as hospitalization, family emergency, military obligation and academic conference - proof will be required. **A student will receive automatic zero grade for any lab missed not under such extenuating circumstances.**

Attendance in the lecture is not mandatory; however, **makeups for missing in-class quiz/work not under the extenuating circumstances mentioned above will not be considered**.

Academic Dishonesty

The class will follow Iowa State University's policy on academic dishonesty. **Any student suspected of academic dishonesty will be reported to the Dean of Students Office:**
http://www.dso.iastate.edu/ja/academic/misconduct.html

Accommodation

Please contact the instructor as soon as possible if a student has a conflict and/or need an accommodation for valid reasons, including disability, illness, religious practices and observances and military service. Iowa State University complies with the Americans with Disabilities Act and Sect 504 of the Rehabilitation Act. Students in need of disability accommodations please also bring the SAAR form with recommendations for accommodations from the Disability Resources Office when meeting with the instructor. The Disability Resources Office is located in Room 1076 on the main floor of the Student Services Building (515-294-7220, disabilityresources@iastate.edu). Retroactive requests for accommodations will not be honored.

Harassment, Discrimination and Equal participation

Iowa State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon race, ethnicity, sex (including sexual assault), pregnancy, color, religion, national origin, physical or mental disability, age, marital status, sexual orientation, gender identity, genetic information, or status as a U.S. veteran. It is the student's responsibility to ensure his/her own team participation and to involve all team members equally in the lab. **Exclusion, discrimination, and harassment will not be tolerated.** Any student who is experiencing or has concerns about such behavior should contact the instructor, Student Assistance at 515-294-1020, email dso-sas@iastate.edu, or the Office of Equal Opportunity and Compliance at 515-294-7612.

Dead Week

This class follows the Iowa State University Dead Week policy as noted in section 10.6.4 of the Faculty Handbook: http://www.provost.iastate.edu/resources/faculty-handbook with the exceptions of Labs 9 and 10 and Homework 3 due.

Academic Issues

If a student is experiencing, or has experienced, a problem with any of the above issues, please email academicissues@iastate.edu.

Lab Topics

Practice experiment and data analysis: lab 1, HW 1
Column buckling testing and analysis: lab 2
Composite laminate design: lab 3
Strain gage applications and bending and tensile testing: lab 4a,b
Thin-walled section and shear center: lab 5
Beam deflection and analysis: lab 6, HW 2
Riveted joint design, fabrication and testing: lab 7

Introduction to Nondestructive Evaluation: Lab 8
2D frame testing and analysis: lab 9, HW 3
Structural vibration analysis: lab 10
3D structure model building: lab 10

Tentative Schedule

No written prelab due for Labs 1, 3, 4, 9, 10

Week	Lecture date	Lab date TU Session	Lab date TH Session	Topics	Assignment
1	1-9	1-17	1-12	Lab 1 - Practice Experiment and Data Analysis	Homework 1 Report 1
2	--	--	--	January 16: university holiday, no lecture Lab 1 TU session continues on January 17	
3	1-23	1-31	1-26	Lab 2 - Column Buckling Testing and Analysis	Report 2 Prelab 2
4	1-30	--	--	Lab 3 - Composite Laminate Design (online; no lab work)	Summary 3
5	2-6	2-14	2-9	Lab 4a - Strain Gage Installation	--
6	2-13	2-21	2-16	Lab 4b – Bending and Tensile Testing	Report 4
7	2-20	2-28	2-23	Lab 5 - Thin-Walled Section and Shear Center	Report 5 Prelab 5
8	2-27	3-7	3-2	Lab 6 - Beam Deflection and Analysis	Summary 6 Prelab 6 Homework 2
9	3-6	--	--	Homework 2 – continued Lab 6 TU session continues on March 7	--
				Spring Break (March 13-17)	
10	3-20	3-28	3-23	Lab 7 - Riveted Joint Design, Fabrication and Testing	Summary 7 Prelab 7
11	3-27	4-4	3-30	Lab 8 – Introduction to Nondestructive Evaluation	Report 8 Prelab 8
12	4-3	4-11	4-6	Lab 9 – 2D Frame Testing and Analysis / Lab 10 - 3D Structure Model Building	Homework 3 Summary 9 Report 10
13	4-10	--	4-13	Lab 10 - Structural Vibration Analysis	--
14	4-17	4-18	4-20	Lab 10 - continued	--
15	--	4-25	4-27	Lab 10 – continued (lab open on April 24 lecture time if needed)	--
16	--	--	--	No Final Exam (May 1-5)	--