

THE UNIVERSITY OF COLORADO BOULDER

AS EN311: A

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Syllabus

I : Professor Kenneth Jansen (Lecture Instructor)
E-Mail Address: kenneth.jansen@colorado.edu
Office Hours Location: Zoom
Office Hours Times: Tuesday 3:00-4:00 pm, Thursday, 6:00-7:00 pm

Professor John Evans (Lab Instructor)
E-mail Address: john.a.evans@colorado.edu
Office Hours Location: Zoom
Office Hours Times: Tuesday, 8:30-9:30 am, Friday 4:00-5:00 pm

L L : Zoom
L T : Monday/Wednesday, 11:40 am-12:55 pm

L L : AERO 141 / AERO N240 / AERO N250 / Zoom
L T : Friday, 10:40 am-12:30 pm / Friday, 1:40-3:30 pm

T A : Jeffrey Hadley (Lab Lead)
E-mail Address: Jeffrey.Hadley@colorado.edu
Office Hours Location: Zoom
Office Hours Time: Tuesday 6:00-7:00 pm, Thursday 5:00-5:45 pm

T F : TBD
E-mail Address: TBD

TBD
E-mail Address: TBD

L L A : TBD
E-mail Address: TBD

P : Canvas (<https://canvas.colorado.edu>)

C O :

The primary course objective is to develop a fundamental understanding of the origins and magnitude of aerodynamic forces and moments, primarily on aircraft where they provide the lift and balance needed to fly, and to develop methodologies for modeling and prediction of such forces and moments. A secondary course objective is to develop a fundamental understanding of gas dynamics in nozzles with application to aircraft and rocket propulsion.

Establish a level of competency in the following topics such that you may use this expertise in the design of operational aircraft.

- a. Vector Calculus
- b. Fluid Mechanics
- c. Aerodynamics
- d. Gas Dynamics

- a. Airfoils and Circulation
- b. Subsonic Wings
- c. Wing Sweep
- d. Supersonic Wings

- a. Skin Friction Drag
- b. Form Drag
- c. Induced Drag
- d. Transonic Compressibility Drag
- e. Supersonic Wave Drag

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- a. Potential Flow Theory
- b. Incompressible Thin Airfoil Theory
- c. Compressible Thin Airfoil Theory
- d. Panel Methods
- e. Prandtl Lifting Line Theory

Prerequisites include A PPM 2350, A SEN 2002, and A SEN 2004 with a minimum grade of C in each class. This course is restricted to Aerospace Engineering majors only.

Fundamentals of Aerodynamics, J.D. Anderson, Fifth or Sixth Edition

Course Website and E-mail List:

Course Format:

Grading:

Individual Effort

36 % 6 6 (%)
 24 %
 5 %
 0 % 1 4 2 5 (. %)

Group Effort

5 %
 0 % 1 4 2 5 (. %)
 0 % 1

Letter Grading Scheme:

Letter Grade	Percent Grade	400Scale
	3 .00 00.00 1	4 .00
	0.002 .	3 67 .
	7 .00 .	3 33 .
	3 .006 .	3 .00
	0.002 .	2 67 .
	77 .00 .	2 33 .
	73 .006 .	

Remarks on Grading

examination due to an excused absence, your midterm examination grade will be replaced by your final examination grade associated with the missed midterm material.

The course is broken into 6 topics that are assessed through 6 in class quizzes. These same 6 topics will be tested on the final. Recognizing that testing is never an exact science, your final grade will be calculated from your best percentage of the two topic tests (one from midterm, one from final) according to the following policy. When the better performance on a given topic occurs on the final, the topic score from the final will always be chosen which allows the final to replace any (up to all) midterm scores. However, for a midterm topic to replace a lower topic score on the final, you must score at least a 70% on that topic of the final exam. Thus, failing a topic on the final will result in that topic's score being used in the final exam score with the weighting described at the start of the Grading section above.

400 The date of the final exam is dictated by the University of Colorado Boulder registrar's office and can not be changed or modified. As a result the exam can not be offered early and no make-ups will be permitted. Students are advised to plan their end of semester schedules accordingly.

The final examination will cover all material in the course including lecture, discussions, assignments, and laboratory exercises.

The final examination will be closed book except for three crib sheets, and collaboration on the final examination will not be tolerated. Students who are caught in these activities will receive an "F" for the course and reported to the Dean's office for further punitive action.

If you have an "A" midterm examination average grade going into the final examination, you may elect to not take the final examination. In this case, your midterm examination average grade would replace your final examination grade.

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There will be four computational modeling assignments throughout the semester. These are:

- Introduction to Numerical Integration and Computation of Lift/Drag
- Computing Lifting Flow over Thin Airfoils via Superposition
- Computing Lifting Flow over Thick Airfoils via the Vortex Panel Method
- Computing Lifting Flow over Finite Wings via Prandtl Lifting Line Theory

To complete these assignments, students must have access to a computer, basic programming skills, and familiarity with some programming languages and/or environments similar to what is covered in introductory computing courses. The minimum requirement is some proficiency with MATLAB. If you are not familiar with MATLAB, it is your responsibility to become so. You have access to

Attendance Policy:

Attendance is e

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accommodation because a disability prevents you from fulfilling these safety measures, please see the "Accommodation for Disabilities" statement on this syllabus.

Before returning to campus, all students must complete the [COVID-19 Student Health and Expectations Course](#). Before coming on to campus each day, all students are required to complete a [Daily Health Form](#).

Sexual Misconduct, Discrimination, Harassment, and/or Related Retaliation:

The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, intimate partner abuse (including dating or domestic violence), stalking, protected-class discrimination, or harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, [anonymous reporting](#), and the campus resources can be found on the [OIEC website](#). Please know and knowance (