

## Course Information for AerE 311

**Note:** this document is subject to change by the instructor during the semester.

### General Information

Instructor: Alric P. Rothmayer  
2235 Howe Hall  
roth@iastate.edu

Office hours: to be arranged in class.

**Pre-requisites:** AerE 243/310 (incompressible aerodynamics)  
ME 231 (thermodynamics)  
Math 265 (calculus of functions of several variables, vector calculus)  
Math 267 (ordinary differential equations)

### Course structure:

Reference: Anderson, Fundamentals of Aerodynamics (or another AerE 310 textbook)

Grading: midterm exam (30%), final examination (30%), quizzes (20% = 4 quizzes + in class problems counted as 2 quiz grades) and homework (20%). Homework will be collected on the days listed in the schedule or announced in class. All homework will be collected at the beginning of the class. Grading scales and policies are outlined below.

Please address any special needs or special accommodations with me at the beginning of the semester or as soon as you become aware of your needs. Those seeking accommodations based on disabilities should obtain a Student Academic Accommodation Request (SAAR) form from the Student Disability Resource (SDR) office (phone 515-294-7220). SDR is located on the main floor of the Student Services Building, Room 1076. **Important:** anyone who has an accommodation will be responsible for arranging times/rooms with the department and coordinating those with me.

### Course Objectives

1. Review mathematics, thermodynamics and fluid mechanics needed for gasdynamics.
2. Solution methods for shocks and expansions, applied to nozzles, diffusers and airfoils.
3. Introduction to compressible flows with heating.
4. Potential flow methods for subsonic and supersonic airfoils.
5. Selected special topic(s) in compressible flows.

### Pet Peeves and Suggestions

1. Please be on time (especially on test days), coming in late can be very disruptive.
2. Keep up with the material and review the notes before each class.
3. Do not study and do homework at the last minute. Pace yourselves.
4. Attend class and pay attention. Material is often clarified during class discussion and I will hold you responsible for any material presented and discussed in class.
5. If you are having problems, see me early – don't wait until it's too late.
6. You may consult each other as much as you want when doing the homework, but you will be better off doing it yourself.
7. Put away your cell phone! Tablet and cell phone use is only ok for reading lecture notes.
8. No game playing, web browsing or text messaging!

## **ISU Academic Policies**

### **Academic Dishonesty**

The class will follow Iowa State University's policy on academic dishonesty. Anyone suspected of academic dishonesty will be reported to the Dean of Students Office.

<http://www.dso.iastate.edu/ja/academic/misconduct.html>

### **Disability Accommodation**

Iowa State University complies with the Americans with Disabilities Act and Sect 504 of the Rehabilitation Act. If you have a disability and anticipate needing accommodations in this course, please contact (instructor name) to set up a meeting within the first two weeks of the semester or as soon as you become aware of your need. Before meeting with (instructor name), you will need to obtain a SAAR form with recommendations for accommodations from the Disability Resources Office, located in Room 1076 on the main floor of the Student Services Building <http://new.dso.iastate.edu/dr/student>. Their telephone number is 515-294-7220 or email [disabilityresources@iastate.edu](mailto:disabilityresources@iastate.edu). Retroactive requests for accommodations will not be honored.

### **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>.

### **Harassment and Discrimination**

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. Any student who has concerns about such behavior should contact his/her instructor, <http://new.dso.iastate.edu/sa/>, Student Assistance at 515-294-1020 or email [dso-sas@iastate.edu](mailto:dso-sas@iastate.edu), or the <http://www.hrs.iastate.edu/hrs/node/99> Office of Equal Opportunity and Compliance at 515-294-7612.

### **Religious Accommodation**

If an academic or work requirement conflicts with your religious practices and/or observances, you may request reasonable accommodations. Your request must be in writing, and your instructor or supervisor will review the request. You or your instructor may also seek assistance from the <http://new.dso.iastate.edu/> Dean of Students Office or the [www.hrs.iastate.edu/hrs/node/269](http://www.hrs.iastate.edu/hrs/node/269) Office of Equal Opportunity and Compliance.

### **Contact Information**

If you are experiencing, or have experienced, a problem with any of the above issues, email [academiciissues@iastate.edu](mailto:academiciissues@iastate.edu).

## Grading Policies

**Important:** all quizzes and tests are closed book. No material may be used for quizzes. Only equation sheet provided in class can be used for tests.

Return of Graded Materials: Due to departmental policies, all graded materials (i.e. tests, quizzes and homeworks) will be returned individually during class. In order to avoid significant disruption to the class schedule, this will be done when we have in-class problem sessions that are longer than 15 minutes. This may delay the return of graded material, since the material will be returned during the first available in-class problem session that lasts longer than 15 minutes. Graded materials can be picked up in my office only after the bulk of the graded materials have been handed back in class. In-class practice problems and final examinations will not be returned.

Homework: I expect the homework to be neat, readable and complete. Points are listed on the homework statement and grading will be 0.5 or 1 point accuracy, depending on the problem. Extra consideration will be given for more complete analyses. Points will be deducted for sloppiness, lack of clarity and lack of detail – even if you have the right answer. If your solutions are sloppy enough that I or the grader cannot easily see what you are doing then you will get a zero, irrespective of whether or not your solution is correct. The final homework grades will be curved by adding the same number of points to each final homework average (i.e. the average of all homework grades) so that the highest homework average is 100%.

**Problems that require a solution graph must use computer generated plots (hand-plotted graphs are not allowed).** The problem will state the number and type of plots required.

**To receive full credit for problems that require or use computed solutions, a listing of the source code must be included with the solution and the steps of the solution and input parameters must be listed in the problem write-up. Solutions that simply state an answer with little or no detail will receive zero credit.**

**Any solution that involves the use calculators, online programs or computational methods must have all of the problem details documented. If you simply write down the final answers you will not receive credit.**

You should feel free to collaborate with your classmates on the homework. Some (but not all) of the homework solutions will be posted on the course website.

**Homework grading policy:** Available points for each problem will be listed on the homework. Full points will be given if everything is done (even if not completely correct). 50% credit will be given if major elements are missing from a problem, or if there is not enough detail, or if the solution has major conceptual mistakes (a minimum 50% deduction will automatically be given if source codes or plots are not provided for homeworks that require them, a 100% deduction will be given when most of the plots are not provided for problems that are primarily computational). You get no points if the problem is not done or if it is completely wrong (i.e. wildly in error). **Late homeworks will not be accepted. Homework problems or closely related problems may be used on the midterm and final exams.**

Quizzes: will be graded on a 1–10 scale with 0.5 accuracy. The quizzes will cover definitions, theory and derivations given in the lecture as well as simple problems related to the lecture. Quizzes will be comprehensive from the start of the semester. It is relatively easy to get a high grade on quizzes if you study regularly. The final quiz grades will be curved by adding the same number of points to the final quiz average (i.e. the average of all quiz grades) so that the highest quiz average is 100%.

**All quizzes are closed book/notes. You may not use any electronic device of any sort while taking a quiz. Any use of an electronic device will result in a zero for that quiz.**

**Taking the quizzes and tests and cheating:** The quizzes and tests will be handed out upside down with a cover. You are not allowed to look through the stack, look at the quiz or turn it over until instructed to do so. Anyone caught looking at a quiz or looking through the stack prior to the instruction to turn the quizzes over will receive a zero – no exceptions, for any reason whatsoever.

In Class Problems: Short problems will be handed out in class for solution that day or as an assignment for the next class. These may be collected and graded. Grades for each problem will be 0 or 1, and you will not be penalized for incorrect solutions. You will only get a 0 if you do not turn the problem in or if you do not make a reasonable attempt to solve the problem. The in–class problem grades will not be curved. The final in–class problem grade will be normalized to a maximum of 10 points and will be counted as **two quiz grades** (i.e. 1/3 of the total quiz grade).

**You may submit in–class problems up to one week after collection in class.** Problems turned in after that time will not be graded.

Tests: The midterm exam and the final exam will be closed book. An equation sheet may be provided for the exams. All exams are comprehensive and graded on a 1–100 scale with one point accuracy. The test grades will each be curved by adding the same number of points to individual test grades so that the highest grades are each 100%.

#### Final Grading Scale:

final grade =  $0.3 \times \text{Midterm} + 0.3 \times \text{Final Exam} + 0.2 \times \text{Quiz Ave.} + 0.2 \times \text{Homework Ave.}$

90–100	= A
85–90	= A–
80–85	= B+
75–80	= B
70–75	= B–
65–70	= C+
55–65	= C
50–55	= C–
45–50	= D+
40–45	= D
35–40	= D–
below 35	= F

### Policy for Curving Grades for Multiple Sections:

If I teach multiple sections in the same semester, then the curve for each item will be an average of the curve for the multiple sections. However, the curve for each section may be applied individually to each section at the instructors discretion.

### Policy for Missed Assignments and Examinations:

**In general, you may make up assignments or turn in assignments late for an excused absence that follows university policy.** A written statement documenting the absence must be provided and must contain sufficient information to verify the reason for the absence.

Homework is due at the beginning of the class period on the due date assigned in the class schedule. Late homework will not be accepted and will be given a grade of zero. **If you know that you have to miss a class, or if you are sick on the due date, then it is your responsibility to either arrange to have the homework delivered to me on, or before, the due date or contact me by email to arrange an extension.** When arranging an extension by email, you must state the reason for the extension in the email and I must approve the extension. The extension will be no later than the class period after the due date. Up to two extensions will be allowed for late homework, providing that you have a legitimate reason for requesting the extension (i.e. I will not grant more than two homework extensions under any circumstances).

**To be allowed to take a make-up quiz, the absence from a quiz must be communicated to me by email on or before the date of the quiz.** The quiz should be made up as soon as possible following the original date of the quiz.

**Any missed in-class problem will be given a grade of zero, unless it is an excused absence that follows university policy.** This includes a failure to hand in a problem due to missing class on the day it is collected.

To be excused from an examination requires **written notice** and must include substantial written justification (i.e. a detailed written explanation about why you had to miss the exam, including contact information that can be used to verify the reason for missing the exam). In general, absences from the midterm and final examinations will not be allowed except due to extreme mitigating circumstances, which must be documented in writing.

**Important:** Make-up examination content, grading and curving are at the discretion of the instructor and will not follow guidelines established for regular examinations.

### Policy for Changing a Grade:

All grade change requests for quizzes, homeworks or tests must be submitted in writing with a clear justification for the requested change and a clear indication of the location of the item in question.