Aero 302, Aerospace Engineering Laboratory I: Spring 2013
Syllabus

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Office Hours: 3:00pm-4:00 pm, Monday; 11:30am-12:30pm, Thursday

Technical Writing Assistant: TBD

Lectures: Mondays 4:10 – 5:25 in HRBB 131
Lab Sessions: Tuesdays 2:20–5:10 in HRBB 105 or Thursdays 2:20–5:10 in HRBB 105. Lab-session attendance is mandatory.

Safety
Safety in the laboratory is our primary concern at all times. Labs are dangerous places. Everyone must exercise great care to avoid injuries to themselves and others as well as to avoid damaging equipment. Detailed safety instructions will be distributed before the first lab and during the first lab session we will be conducting a safety orientation. Following this, you will be required to sign a safety contract before undertaking any laboratory work. Minor violations of the safety policy will result in a 5% reduction in overall course grade. Flagrant violations will result in removal from the lab and immediate failure.

Text
No text is required for this course. We will be covering a wide range of materials and it would be impractical to buy three or four books for a single chapter each. Taking good notes during class is your best bet. Certain material will also be distributed in handouts. For reference I suggest:

Grading
Grades will be assessed based 15% on homework assignments, 50% on three individual lab reports and 35% on group presentation and two group lab reports. Group activities will receive group grades with small adjustments for individual contributions to the group. Written assignments are due at 4:00 PM on the due date and are to be submitted via email in pdf format to rediniotis@tamu.edu. Homework assignments are due in class on the due date. Extensions will only be granted with at least 48 hours notice. It is possible for everyone to receive an A in this course. It is my hope that you all do.
Academic Integrity
The Code of Honor is stated simply as: An Aggie does not lie, cheat, or steal or tolerate those who do. The Code of Honor is an effort to unify the aims of all Texas A&M men and women toward a high code of ethics and personal dignity. For most, living under this code will be no problem, as it asks nothing of a person that is beyond reason. It only calls for honesty and integrity, characteristics that Aggies have always exemplified. As commonly defined, plagiarism consists of passing off as one’s own the ideas, work, writings, etc., that belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have questions regarding plagiarism, please visit http://www.tamu.edu/aggiehonor and consult the latest issue of the Texas A&M University Student Rules at http://student-rules.tamu.edu/. In Aero 302, you are encouraged to work with other students while you are completing your individual assignments. Help each other understand the material. However, all the work you submit must be your own; it may not be copied from another student. Likewise, for lab analyses and reports, groups may give other groups suggestions. But, each group must perform and submit its own work. Perhaps more serious than plagiarism, laboratory work can sometimes tempt one to modify, fabricate or ignore data that does not support the expected or desired results. This temptation is often exacerbated by looming deadlines. However, your grade here and your later success and honor as a professional depend on you not modifying, fabricating or ignoring data to fit a pre-determined result. In this class you will be judged not on how well your results match “expected” results but rather on your laboratory and analytical skills as well as your skills as a writer. If the results and conclusions you reach are not those you or I expect, that’s fine. We do experiments because we don’t know the answer. We do experiments to find the truth.

Copyrights
The handouts used in this course are copyrighted. By “handouts” we mean all materials generated for this class, which include but are not limited to syllabi, lab problems, in-class materials, review sheets, and additional problem sets. Handouts may be distributed in class or electronically. Because these materials are copyrighted, you do not have the right to copy the handouts, unless the author expressly grants permission.

Americans with Disabilities Act (ADA) Policy Statement
The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities in Room B118 of Cain Hall or call 845-1637.

Group Dynamics and Assessment
Much of the work in this class will be conducted in groups. Groups will be selected at random and will stay together throughout the semester. There are a number of reasons that this is a good arrangement for effective learning and retention. Working in groups is also useful training for your eventual professional careers. An overall group grade will be given for each of the group activities. At the conclusion of each activity, each of you will also submit a confidential individual assessment of the contribution by each of your group members and yourself. Small adjustments to each member’s grade on that lab will be made based on these assessments.
Because the adjustments are small, it is more effective for groups with a weak member to get that person to contribute more rather than slam that member with bad evaluations. Assessments will consist of a single word that indicates the extent to which each member including you fulfilled his/her/your responsibilities. The possible ratings are:

**Excellent:** Consistently went above and beyond, tutored group members, carried more than his/her fair share of the load.

**Very Good:** Consistently did what (s)he was supposed to do, well prepared and cooperative

**Satisfactory:** Usually did what (s)he was supposed to do, acceptably prepared and cooperative

**Marginal:** Sometimes failed to show up or complete assignments, minimally prepared and cooperative

**Deficient:** Often failed to show up or complete assignments, rarely prepared.

**Unsatisfactory:** Consistently failed to show up or complete assignments, unprepared.

Ratings are not your opinion of the grade that is appropriate for each group member. Ratings are used to adjust the group grade to reflect individual contributions. If a group grade is an ‘A’ and the group members all receive equal ratings, all will receive an ‘A’, regardless of whether their ratings were ‘excellent’ or ‘satisfactory’. If the same hypothetical group had a group grade of ‘C’ and decided to all rate each other as ‘excellent’, everyone would still receive a ‘C’. Please use the guidelines above to select your ratings so that I can have a correct understanding of the dynamics of each group. It is my intention that ‘satisfactory’ be a typical and honorable rating. As a last resort, it will be possible to fire dysfunctional group members or to quit or disband dysfunctional groups. However, this will only be considered after repeated deficient or worse performances and meetings with me about the situation.

**Course Purpose and Objectives**

*Catalog Description*

Demonstrates and complements material in courses on aerodynamics, structures and dynamics; basic testing techniques and use of computers. This is a writing-intensive ‘W’ course.

This description is too general for you to know what you will be expected to learn during this class. This page gives more information about the skills I intend this course to develop. These fall into six major categories summarized below:

**Experimental Uncertainty, Error, and Simple Statistics**

How confident are we in our measured values? How does measurement uncertainty affect uncertainty of computed results? What is statistical significance? How do these considerations affect how an experiment is designed and conducted?

**Computerized Data Acquisition**

How do we use computers to perform experimental measurements? What elements make up a computerized data acquisition system and what is the function of each?

**Linear Regression**

How do we fit a function with unknown parameters to data? How certain are we of these parameters? How do we know that a fit is good?

**Fourier Transforms**

How do we handle fluctuating, periodic data? How do we determine the dominant frequencies in a signal? What is signal power?

**Basic Instrumentation**
What instruments are used to measure common properties? What are advantages and disadvantages of each?

Report Writing
How do we communicate what we learn in the lab? What is an effective data plot? How do we evaluate what other have written?

All of the work in the course will concern measurements of aerodynamic or thermodynamic properties. We’ll use simple wind tunnels and instruments typical of basic aerodynamics experiments. This is intended to reinforce or introduce concepts from Aero 212, 301 and 303 and set the stage for more sophisticated experimental efforts later. Finally, as an overall goal, I would like you to be able to think about what goes on in the lab in a sophisticated enough manner to critique experiments, design new experiments, and communicate effectively about your experiment and why your way is the right way to do it. On top of this, I would like you to be able to conduct these activities as part of a group, because, in reality, nearly all engineering occurs in group settings. These skills are crucial for success later classes, landing a job, and becoming a successful professional.