Experimental Aerodynamics I
MAE 253
Spring 2018

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Office hours: By appointment

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Objective To advance the student's experience in applied experimental analysis by performing "open ended" mechanical and aerodynamic studies that directly relate to other sophomore level courses. Through the study of MAE 253 the student will:

- Perform system level experiments and apply results.
- Perform experiment planning and scheduling.
- Understand data acquisition issues.
- Prepare technical reports in industry supported formats.

Reference Texts

- Barlow, J. B., Rae, W.H., and Pope, A., "Low Speed Wind Tunnel Testing, 3rd Edition," Wiley and Sons, New York, NY.
- Anderson, J. D. "Fundamentals of Aerodynamics," McGraw-Hill, Boston, MA.
- Dyke, M. V., "Album of Fluid Motion," The Parabolic Press, Stanford, CA.

Assignments Written assignments will be submitted for each experiment. The format and content will be defined during the lectures. The reports will need to be in the AIAA technical report format (https://www.aiaa.org/techpresenterresources/). ***The assignments must be submitted online (using Moodle) on the date designated by your instructor. Late assignments will be severely penalized, 15pts same day and 15pts per additional day.***

Project Work The class will be divided into groups of five/six to work on a final semester project. Further details with regard to the project will be provided during the course of the semester.

Grading The final lab grade will be determined as the average of the individual assignments (75%) and project work (25%). We will use the university mandated grading system.

Attendance In order for every student to receive the same preparatory material for each experiment there will be a lecture session at the start of the scheduled laboratory session.

Absences Due to the nature of this course, absences cannot be tolerated. Exception may be granted only with prior consent from your instructor or with a legitimate (university acknowledged) excuse. ***Failure to comply with this will result in a zero credit for the lab.***

Course Schedule

Experiment	Lab Session	Report Submission
Pressure Transducer Calibration	01/23 – 01/25	02/05
Wind Tunnel Turbulence Study	02/06 – 02/08	02/19
Airfoil Aerodynamics (Lift)	02/20 – 02/22	04/16
XFOIL	02/27 – 03/01	
Airfoil Aerodynamics (Drag)	03/27 – 03/29	
Project Work	04/09 – 04/27	05/04

Academic Integrity See the NCSU Code of Student Conduct (https://studentconduct.dasa.ncsu.edu/code/). Plagiarism will result in a direct fail for the particular assignment.

Students with Disabilities Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the *Disability Services Office at 2221 Student Health Services Building, 2815 Cates Ave., Campus Box 7509, 515-7653* (https://dso.dasa.ncsu.edu/how-to-register-with-the-dso/).

Safety Each experiment performed in this course requires specific procedures to be followed to ensure the safety of personnel and equipment. These will be addressed in a safety briefing during each lecture. Also, a general lab safety manual will be available for review in each facility.

Extra Expenses None

Transportation None

Contact E-mail and Moodle will be used extensively to convey assignments and experimental data. All students will be expected to check both regularly.