

AE 3182 - Aerodynamics and Fluids Laboratory Spring 2015

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Required Readings/Materials:

Recommended, non-mandatory text:

Low-Speed Wind Tunnel Testing, [J. B. Barlow, W. H. Rae, A. Pope]

Other references:

High-Speed Wind Tunnel Testing, [A. Pope, K. L. Goin]

Course notes

Posted on Blackboard

Lab manual

Posted on Blackboard

Course Description:

Wind tunnel experiments to study flow phenomena of aerodynamic interest (spanning from low subsonic to supersonic regimes), including boundary-layer surveys, testing of airfoils, wing and testing of scale models of aircraft.

Course Learning Goals/Objectives:

The objective of this course is to apply and extend the theoretical knowledge acquired by the student in previous courses to selected laboratory experiences centered on experimental aerodynamics. The design of the experiment (models, flow regime, instrumentation, and data acquisition) as well as the interpretation of the results will require a critical analysis of the assumptions and simplifications used on deriving the theoretical models allowing the student to mature a competent understanding of their validity range and application.

Attendance and Drop Policy:

Attendance is required.

Tentative Schedule (course content):

The Lab is centered on the selected experimental experiences and for each module a comprehensive review of the fundamental will precede the experimental activity. A calendar with the details of the planned activities is available on Blackboard and will be discussed with students in class.

Experiments tentative chronology

- 1 Wind Tunnel Calibration (WH221A)
- 2 Verizee Model Stability test (ARC)
- 3 Shock tube (ARC)
- 4 Free-jet (ARC)
- 5 Finite wing (WH221A)

Lectures tentative chronology

- 1 Wind Tunnels 1
- 2 Wind Tunnels 2
- 3 Introduction to Boundary Layers
- 4 Introduction to Turbulence

Specific Course Requirements with descriptions**Examinations:**

2 mid-term tests

Final Examination:

No final exam.

Other Graded Assignments (Homework / Projects / Labs / Research Papers):

Missed labs are subjected to tardiness policy – 10% per day. Labs that are copied will receive a score of zero and the student will be indicated to the disciplinary committee. No makeup exams unless arrangements are made in advance.

Grading Format Weighting / Point Value of Assignments and Examinations:

Labs: 80%, Mid-term1: 11 %, Mid-term 2: 9%.

(Grading Scheme: A: 90-100%; B: 80-89%; C: 70-79%; D: 60-69%; F: <60%)

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