

MAE 338
Fluid and Thermal Sciences Laboratory
Fall 2003

Instructor:

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TAs:

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6PM to 8PM (W)

Course Content

This laboratory course will cover a series of experiments involving the fluid and thermal sciences. You will learn how to take classroom concepts and relate them to what is happening in the real world. You will gain hands-on experience with the fundamental tools of investigation in fluid mechanics and heat transfer and learn how to approach and solve problems typically encountered in engineering experimental work.

Five different experiments have been designed to provide and enhance the understanding of Fluid Mechanics (MAE 335) and Heat Transfer (MAE 336). The experiments are: (1) Viscosity Measurement, (2) Sphere Drag, (3) Flow Meter Calibration, (4) Double Pipe Heat Exchanger, and (5) Natural Convection.

Course Procedure

Each student is expected to complete the five experiments during the course of the semester. You will be working in groups of two and have two weeks to work on each experiment.

At the beginning of each experiment, there will be a brief check-in quiz in written form, after which you will work on your experiment. The week between the two lab sessions should be used to write your lab report. Your lab report is due at the beginning of the second week's class, and the TAs will give you an oral quiz on the experiment. After the oral quiz, the TAs will briefly introduce the next experiment to you.

1. **Check-in quiz:** Before students start experiment, a short written check-in quiz (3~4 questions, approx. 10 min.) will be given. To answer those questions, you should be familiar with the theory behind the experiment as well as the experimental equipment *before* you enter the lab. This means you should have at least read the lab notes.
2. **Lab report:** You are required to write and hand-in lab reports, which is due before your oral quiz. The lab report should include (a) a *brief* write-up of the experiment including

- theory and experiment procedure; (b) experimental data (presented in tables) and all the plots required in the lab note; and (c) answers to the questions in the lab note.
3. **Oral quiz:** In the second session of each experiment, the TAs will ask you a few questions about the experiment to determine your level of understanding of the subject. The oral quiz is about 10 min.

Grading

Check-in quiz: 25%; Oral quiz: 25%; Lab report: 50%. (No midterm and final exam)

Textbooks/Lab notes

The laboratory notes (required) are available on the course website at:
<http://www.eng.buffalo.edu/Courses/mae338>

Any books being used for Fluid Mechanics (MAE 335) and Heat Transfer (MAE 336) can be used as reference textbooks.

Things You Need to Know

- (1) University at Buffalo requires you to wear safety goggles during the experiment.
- (2) After you finish the experiment, please ask the TA to check your data and the setup before you leave the lab.
- (3) Each group will be assigned a 15-minute time window for the second session of each experiment, in which the group will take the oral quiz from the TA.