

University of Cincinnati
Department of Civil and Environmental Engineering
20-CEE-494 Fluid Mechanics and Hydraulic Systems Laboratory

Spring 2007

Monday 12:00-12:50 Baldwin 533

Tuesday 8:00-10:50 Baldwin 537

Instructor: Aisha Tzillah, 791 ERC, (513) 476-7252

Office Hours: 2 – 4 PM, Thursday, or by appointment

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Course Description:

Laboratory experiments designed to provide a physical demonstration of hydrostatics, pipe flow, measuring devices, and open channels. Course includes computer-aided analysis of hydraulic systems. Laboratory will closely follow theoretical course 20-CEE-493.

Laboratory Schedule:

- Week 1 Introduction
- Week 2 Lab 1 – Velocity Distributions in Laminar and Turbulent Flow
- Week 3 Lab 2 – Flow Through Pipes Network
- Week 4 Lab 3 – Estimation of Manning’s “n”
- Week 5 Lab 4 – Rectangular and V-Notch Weir Calibration
- Week 6 Lab 5 – Overflow Spill-way and Hydraulic Jump
- Week 7 Lab 6 – EPANET – Hydraulic Modeling
- Week 8 Lab 7 – HEC-RAS
- Week 9 Make-up Laboratory (if needed)
- Week 10

Grades and Policy:

All laboratory reports will account for 80% of the total grade. Lab groups will consist of 4 – 5 persons per group. Each person is responsible for turning in a report one week after the laboratory is performed. Late reports will be reduced in grade by 10% per day overdue. Absence from lab (or non-involvement) without a valid excuse will result in a 25% grade reduction on the corresponding lab report. There will be a total of 7 laboratory reports: 5 hands-on experiments and 2 computer simulations. Proper attire is required in the laboratory.

Quizzes will be given at the beginning of the lecture class (15 minutes) and will be worth 15% of the total grade. Lecture time will be utilized for background and experiment explanation. No exam will be given in the laboratory course. Course materials will be provided in class or posted on Blackboard.

Class attendance and participation are allotted 5% of the total grade.

Lab Reports:

Grading will be determined by consideration of the following criteria:

1. Level of student understanding as evidenced by Results and Discussion sections
2. Correctness of calculations
3. Strong emphasis on correct spelling and grammar as well as concise writing style
4. Overall appearance, organization, and format of the report, must be stapled with numbered pages (5 – 10 pages, single spaced)
5. A large portion of the grade will be determined by the student's ability to concisely communicate their understanding of the material and the specific results
6. Total grade of 100

Cover sheet: 5 points

- Include name of the course, lab number, title of the experiment, student's name, lab group, date lab performed, and date lab report submitted

Abstract: 20 points

- Abstract gives the summary of the objectives, actual key findings and overall conclusions. This should range from a half to three-quarters of a page

Objective: 10 points

- Brief statement of the goals of the experiment

Results: 15 points

- Experimental data and corresponding calculated results clearly and concisely shown using table and graphs.
- Key results of the experiment should be labeled

Discussion: 25 points

- Important results, as shown in the previous section, should be identified and discussed
- Discuss whether results reflect what was anticipated from the theory
- Supply sufficient theoretical information, such as major equations and key principles, to help solidify your arguments. If results do not correspond to theory, then discuss any possible sources of error in the experiment to cause such discrepancies
- Answer any essay questions presented in the lab write-up
- Include brief description of how key principles of the lab can be used in the civil and/or environmental engineering fields

Sample Calculations: 20 points

- This section may be *neatly* hand written in blue or black pen
- List formulas used and an example of the calculations using the actual data

Raw Data: 5 points

- Copy of the raw data sheet compiled by each group