

CE 329 - FLUID MECHANICS LABORATORY

COURSE SYLLABUS: Spring 2017

Instructor: Sasha Schück
Email: sschuck@email.arizona.edu (best way to contact me)
Laboratory: Monday or Wednesday 2:00-4:50 pm, CE 120
Office hours: Friday 10:00 -11:50 am
Office: Civil Engineering Building –Room 214

Course Description: It is a one credit laboratory consisting of **12 experiments** including one as demo. The emphasis is on open-channel and closed conduit studies of basic flow phenomena particularly on continuity, conservation of momentum, exchange of energy, and calibration of flow-measuring devices.

Prerequisites or Co-requisites: CE 218 (Mechanics of Fluids).

Workbook and Text: CE 218 reference/text book (Fundamentals of Fluid Mechanics: Munson Young Okiishi).

Required Texts and Materials: The Fluid Mechanics Laboratory Manual. It includes all the instructions for the experiments (see d2l for the pdf of this manual).

Class Policies: All students are expected to attend all the classes, lectures and laboratory sessions. Students are expected to arrive to class on time and prepared to work. Students absent from lectures and laboratories will be responsible for all material covered during the sessions. Missing more than **2 lectures and 1 lab** may result in administrative drop of the class with a grade of E. If you need to be absent from the class with a justifiable reason (sickness, family obligations, jury duties, etc), you must inform the instructor in advance and bring the pertinent certification.

Laboratory Work and Reports: Students should work in fixed groups of four people to perform the designated experiments. A brief report of each experiment should be prepared by each group and should be turned in at the beginning of the next lab session (one week after the experiment has been done). If no lab session is held on the due date, the report must be delivered it personally on that day or any time before the deadline. **Electronic version of the report is also required to submit to the dropbox on d2l.**

Note: and if report turned in late, 5 points will be deducted from the actual grade for each late day.

Exams: Any student who misses an exam will be awarded with a zero for that test. All students must take all the exams on the announced time in class. **There is no make-up exam.**

Class Participation: Your active participation in all the laboratories is strongly expected and it will influence your final grade. Each group will perform all the experiments and every member is expected to cooperate during the lab.

Grading: All laboratory reports, exams, and class participation will count towards the final grade according to the following grading system:

12 Lab Reports	50 %
Midterm	20 %
Final	20 %
Class participation	10 %

Work schedule:

Group A (Monday)*

Experiment	Lecture and Lab	Date	Remarks
1	Course introduction and Hydrostatics	23-Jan	
2	Drain tank	30-Jan	
3	Submerged jet theory	6-Feb	
4	Free jet	13-Feb	
5	Cavitation	20-Feb	
6	Smooth pipe theory	27-Feb	
Mid term		6-Mar	No lab
7	Pressure surge	20-Mar	
8	Flow in rough pipe	27-Mar	
9	Centrifugal pump	3-Apr	
10	Open channel flow	10-Apr	
11	Open channel flow (Hydraulic jump)	17-Apr	
12	Scour analysis (DEMO)	24-Apr	
FINAL EXAM		TBD	No lab

*laboratory schedule may change depending on circumstances.

Group B (Wednesday)*

Experiment	Lecture and Lab.	Date	Remarks
1	Course introduction and Hydrostatics	25-Jan	
2	Drain tank	1-Feb	
3	Submerged jet theory	8-Feb	
4	Free jet	15-Feb	
5	Cavitation	22-Feb	
6	Smooth pipe theory	1-Mar	
Mid term		8-Mar	No lab
7	Pressure surge	22-Mar	
8	Flow in rough pipe	29-Mar	
9	Centrifugal pump	5-Apr	
10	Open channel flow	12-Apr	
11	Open channel flow (Hydraulic jump)	19-Apr	
12	Scour analysis (DEMO)	26-Apr	
FINAL EXAM		TBD	No lab

*laboratory schedule may change depending on circumstances.

Guide to Laboratory Work and Reports

Laboratory reports:

This short guide seeks to standardize your reports following Style for all the Department's Laboratories. Paragraph headings provide a framework for the structure of the report and the text underneath them covers the main aspects that will mostly satisfy the requirements. The numbers in parenthesis shows the points for that paragraph. All reports will be checked for plagiarism using the Turn-it-in software.

CE 329: Fluid Mechanics Laboratory Report

Memorandum

To: Sasha Schück
From: Your group number
Lab Partners: Name of members of the group
Date: January 30th, 2017

Subject: Laboratory Report on (subject), CE 329, The University of Arizona.

(5 pts.) **Objective:** State clearly the purpose for the laboratory investigation.

(5pts.) **Apparatus:** List and describe the tools and apparatus together with a sketch (You can refer to the lab manual for sketch. For example, for the first experiment, by referring to the lab manual you don't need to draw a sketch).

(5 pts.) **Test Procedure:** Refer to a standard test procedure (if one was followed) and indicate modifications, if any. (For example, the procedure described in page 5 of the manual was followed).

(10 pts.) **Remarks:** Discuss briefly any test problems, discrepancies, test errors, mistakes, etc. In short, any factors which you believe may have affected the results. Comment on the reliability of the results and how it can be improved next time.

(25 pts.) **Test Results:** Give numerical results including numbers and or graphs. You may want to attach graphs as a figures saying: Figure 1 and referring to it in the body of the text. The point is to present the results, describe any trends, but do not make generalizations at this point. Only present the results.

(25 pts.) **Conclusions:** Now that the results are presented, what do they mean? Be concise, but complete. This is not a summary but it is a conclusion of the results: what they mean, and what is the answer to the question that was the reason for the laboratory work in the first place. Make sure you include elements of the theoretical background was covered during the Lecture. Indicate which equations have been utilized to compare the theoretical values with the measured during the experiment. **Answer all the questions that are listed in each experiment procedure.**

The following are examples of poor conclusions:

“The overall objectives of this laboratory experiment were met. The readings were performed on time and correctly. The procedure for our group was over seen by the laboratory assistant and all of our questions were answered immediately leading to an accurate and prompt completion of the laboratory...”

“The results seem reasonable...” “If you state this you had better state to which reference the comparison is being made.

(5 pts.) **References:** List references used.

(20 pts.) **Appendices:** Include raw data, detailed calculations and any other material that is pertinent to the readers and documentation of the laboratory work completed. The calculations does not need to be typed in a text editor (But should be clear enough to follow your work).

Academic Integrity

Principle Integrity and ethical behavior are expected of every student in all academic work. This Academic Integrity principle stands for honesty in all class work, and ethical conduct in all labs and clinical assignments. This principle is furthered by the student Code of Conduct and disciplinary procedures established by ABOR Policies 5-308 through 5-404, all provisions of which apply to all University of Arizona students.

This Code of Academic Integrity (hereinafter "this Code") is intended to fulfill the requirement imposed by ABOR Policy 5-403.A.4 and otherwise to supplement the Student Code of Conduct as permitted by ABOR Policy 5-308.C.1.

Failure to follow the code of academic integrity will result in a grade of zero for the assignment in question, a reduction of the course grade by one letter grade, and being reported to the Dean of Students' office.

Prohibited Conduct: Conduct prohibited by this Code consists of all forms of academic dishonesty, including, but not limited to:

- 1 Cheating, fabrication, facilitating academic dishonesty, and plagiarism as set out and defined in the Student Code of Conduct, ABOR Policy 5-308-E.6, E.10, and F.1
- 2 Submitting an item of academic work that has previously been submitted without fair citation of the original work or authorization by the faculty member supervising the work (see note in laboratory reports).
- 3 Violating required professional ethics rules contained or referenced in the student handbooks (hardcopy or online) of undergraduate or graduate programs, or professional colleges.
- 4 Violating health, safety or ethical requirements to gain any unfair advantage in lab(s) or clinical assignments.
- 5 Failing to observe rules of academic integrity established by a faculty member for a particular course.
- 6 Attempting to commit an act prohibited by this Code. Any attempt to commit an act prohibited by these rules shall be subject to sanctions to the same extent as completed acts.

Student Responsibility

Students engaging in academic dishonesty diminish their education and bring discredit to the academic community. Students shall not violate the Code of Academic Integrity and shall avoid situations likely to compromise academic integrity. Students shall observe the generally applicable provisions of this Code whether or not faculty members establish special rules of academic integrity for particular classes. Students are not excused from complying with this Code because of faculty members' failure to prevent cheating.