

CAPILANO UNIVERSITY COURSE OUTLINE	
Term: Fall, 2018	Course No. PHYS 203
Course: Fluid Mechanics I – The Physics of Flow	Credits: 4.0 Section:
Office: Tel: email:	Instructor:

COURSE FORMAT: Six hours of instructional time consisting of demonstration of theory, active learning, and tutorial sessions for a 15-week semester, which includes two weeks for final exams.

PREREQUISITES: Physics 114 and MATH 126

NOTE: PHYS 203 is an approved Quantitative/Analytical course for baccalaureate degrees. PHYS 203 holds a science course designation.

COURSE STUDENT LEARNING OUTCOMES

On successful completion of this course, students are able to do the following:

- Perform dimensional analysis on fluids
- Describe various types of fluids and their properties
- Describe and calculate various static and dynamic properties of fluids and their effect on containers
- Describe and calculate conditions for turbulent flow
- Calculate the effects of viscosity on both fluid flow and objects moving through fluids
- Use physical laws to mathematically describe fluid flow
- Apply learned methods to realistic examples

REQUIRED COURSE MATERIALS:

Textbook: Merle C. Potter; David C. Wiggert; Bassem H. Ramadan., Mechanics of Fluids, 5th ed., Thomson-Engineering, 2016

Additional material: A graphing calculator is required.

COURSE CONTENT:

Topic	Weeks (approx)
Introduction to Fluid Mechanics Basic Considerations: Definition of fluid, fluid properties, Fluid Statics	2
	2

Hydrostatic pressure and equilibrium, buoyant forces, Pascal's Law	
Fluids in Motion – incompressible vs. compressible flow, laminar flow, velocity profiles, the onset of turbulence, ,	2
The Fundamental Laws of fluid motion, mass-Continuity Equation, Energy and momentum in fluids, integral and differential forms	3
Flow in channels –classification of flows, effect of channel geometry, application of momentum concepts	2
Piping Systems - frictional losses in piping systems, parallel vs. Series configurations, generalized network equations	1
Dimensional Analysis and Similitude – use of normalization to relate observation to predictions	1
Final Exam Period	2

EVALUATION PROFILE:

Final grades for the course will be computed based on the following schedule:

Term Tests (2)	30%
Project	10%
Quiz/Homework Questions	15%
Final Examination	35%
Performance Evaluation	10%
TOTAL	100%

PERFORMANCE EVALUATION:

In the absence of exceptional circumstances, which are determined at the instructor's discretion, the performance evaluation component of the final grade will be prorated to the rest of the grade. For example, a 10% performance evaluation component would be determined by dividing the remaining mark out of 90 by 9. The most common circumstance justifying an increased performance evaluation mark is a student's improved performance in the final examination relative to the midterm exam(s), which the instructor feels justifies an elevated letter grade.

SUPPLEMENTAL 4TH HOUR ACTIVITY:

Supplemental activity might be a scheduled tutorial, an on-line activity, a group meeting, or some other activity as indicated by your instructor.

GRADING PROFILE:

Letter grades will be assigned according to the following guidelines:

A+ 90 - 100%	B+ 77 - 79%	C+ 67 - 69%	D 50 - 59%
A 85 - 89%	B 73 - 76%	C 63 - 66%	F 0 - 49%
A- 80 - 84%	B- 70 - 72%	C- 60 - 62%	

Students should refer to the University Calendar for the effect of the above grades on grade point average.

OPERATIONAL DETAILS:***University Policies:***

Capilano University has policies on Academic Appeals (including appeal of final grade), Student Conduct, Cheating and Plagiarism, Academic Probation and other education issues. These and other policies are available on the University website.

Attendance:

The student is responsible for all information given in the lectures and laboratories, including times of examinations and assignment deadlines.

Missed Exams:

Normally, a score of zero will be given for a missed exam, test, quiz, lab, etc. In some exceptional situations, the student will be permitted to write a make-up test, defer the lab to a later date or to replace the score by other marks.

The situations in which a score of zero may be avoided are those for which the student meets **all** of the following conditions:

1. Circumstances are beyond the control of the student which resulted in the exam, test, quiz, lab, etc. to be missed. Such circumstances include serious illness or injury, or death of close family member. They do **NOT** include forgetting about the test, lack of preparation for the test, work-related or social obligations.
2. The student has notified the instructor (or the School of STEM office staff, if the instructor is not available) about the missed exam, test, quiz, lab, etc. Such notification **MUST** occur in advance, if possible, or at the latest, on the day of the exam, test, quiz, lab, etc.
3. Proof of the circumstances must be provided. Proof of illness or injury requires a note from a doctor, who may also be consulted.
4. The student has been fully participating in the course up until the circumstances that prevented the writing of the exam, test, quiz, lab, etc. **Fully participating means attending almost all classes and turning in almost all assignments in the course.**

The options offered to the student who meets the four conditions are decided by the instructor. They will not necessarily meet the convenience of the student.

Final Exam Period:

Students should note that the final exam period is from **[date] to [date]** (*includes Saturday, [date]*), and that they can expect to write exams at any time during this period. Individual exam times will not normally be rescheduled because of holidays, work, or other commitments. While efforts are made to spread exams throughout the exam period, an individual's particular course combination may result in exams being scheduled close together, or spread widely through the entire exam period.

Cheating/Plagiarism:

Students caught cheating on a test will normally receive a grade of "F" on the course and may be expelled from the University. Plagiarism (including the copying of any part of assignments, laboratory reports, and essays) is a serious offence and is a form of cheating.

Incomplete Grades:

Incomplete grades ("I") are given only when special arrangements have been agreed upon with the instructor prior to the end of the semester. Since "I" grades are granted only in exceptional

circumstances (usually health problems), their occurrence is rare. A student receiving an "I" grade should see the instructor.

English Usage:

Students are expected to use correct standard English in their written and oral assignments, exams, presentations and discussions. Failure to do so may result in reduced grades in any part of the Evaluation Profile. Please refer to the guidelines provided in the Capilano Guide to Writing Assignments (available from the University bookstore).

Emergency Procedures:

Please read the emergency procedures posted on the wall of the classroom.