

COURSE OUTLINE		
TERM: FALL 2019	COURSE NO: PHYS 112	
INSTRUCTOR:	COURSE TITLE: INTRODUCTORY PHYSICS FOR THE LIFE SCIENCES I	
OFFICE: LOCAL: E-MAIL: @capilanou.ca	SECTION NO(S):	CREDITS: 4.0
OFFICE HOURS:		
COURSE WEBSITE:		

Capilano University acknowledges with respect the Lil'wat, Musqueam, Squamish, Sechelt, and Tsleil-Waututh people on whose territories our campuses are located.

COURSE FORMAT

Three hours of instructional time consisting of demonstration of theory, in-class discussions and problem-solving plus three lab hours and an additional hour of supplemental activity delivered through on-line or other activities for a 15-week semester, which includes two weeks for final exams.

COURSE PREREQUISITES

Physics 12 or BPHY 053/054 or PHYS 104; and Pre-calculus 12 or BMTH 054 or MATH 105.

CALENDAR DESCRIPTION

The complexity of life can be described, at its underlying level, with physics. In this introductory course kinematics, forces, static equilibrium, energy and momentum conservation laws, fluid properties and mechanics, properties of soft matter, and thermal physics will be investigated for organisms of all sizes.

COURSE NOTE

PHYS 112 is an approved Science and Technology course for Cap Core requirements.

PHYS 112 is an approved Numeracy course for Cap Core requirements.

PHYS 112 is an approved Quantitative/Analytical course for baccalaureate degrees.

PHYS 112 is an approved Science course.

PHYS 112 is an approved Laboratory Science course.

PHYS 112 is equivalent to PHYS 110 and PHYS 114. Duplicate credit will not be granted for this course and PHYS 110 or PHYS 114.

REQUIRED TEXTS AND/OR RESOURCES

- **Textbook:** Randall D. Knight, Brian Jones, Stuart Field. College Physics: A Strategic Approach. 4th ed. (with Sapling Access Code Single HW Physics Alg). Pearson, 2018.
- **i>clicker remote:** Available from the Capilano University Bookstore

- **Supplements:** Capilano University Physics Laboratory Notebook.

COURSE STUDENT LEARNING OUTCOMES

Students who complete this Laboratory Science course will be able to do the following:

- Mathematically describe the physical interactions of objects in different environments, specifically including biological systems;
- Develop abstract conceptual methods to solve problems;
- Distinguish between important and negligible factors in order to reduce biological systems to simpler solvable problems;
- Use diagrams, graphs, and computational resources for visualization and clarification of problems and real life events into the language of mathematics;
- Communicate results using accepted scientific convention;
- Take and record measurements in a laboratory setting; and
- Analyze recorded data.

Students who complete this Science and Technology course will be able to do the following:

- Apply numerical and computational strategies to solve problems;
- Demonstrate how biological system can be modelled numerically, graphically, or algorithmically;
- Explain how scientific inquiry is based on investigation of evidence and evolves based on new findings;
- Participate in scientific inquiry and communicate the elements of the process, including making careful and systematic observations, developing and testing a hypothesis, analyzing evidence, and interpreting results.

Students who complete this Numeracy course will be able to do the following:

- Apply both analytical and numerical skills to solve problems;
- Summarize and analyze data in quantitative forms;
- Interpret and draw conclusions from an analysis of quantitative data;
- Represent quantitative information in a variety of forms (e.g. symbolically, visually, numerically, and verbally);
- Incorporate quantitative evidence in support of an argument.

COURSE CONTENT

Topics for detailed discussion will be selected from the textbook chapters listed below. Additional readings from current literature or news media may be assigned during the term.

Weeks	Topic
1-2	Kinematics: 1D, 2D description of motion
3-4	Newton's Laws, Free body diagrams, vectors

5	Static analysis of joint stability
6	Biological materials: elasticity, pressure, density
7	Hydrostatics and buoyancy
8-9	Membranes, surface physics, capillary action
10-11	Fluids: laminar flow, turbulence, drag, lift
12-13	Thermodynamic laws, ideal gas, heat transfer
14-15	Final Exam Period

EVALUATION PROFILE

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

Midterm(s)	20%
In-class work	10%
Assignments	10%
Laboratory	20%
Performance Evaluation	10%
Final Examination	30%
TOTAL	100%

PERFORMANCE EVALUATION

In the absence of exceptional circumstances, which are 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.

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.

Incomplete Grades

Grades of Incomplete "I" are assigned only in exceptional circumstances when a student requests extra time to complete their coursework. Such agreements are made only at the request of the student, who is responsible to determine from the instructor the outstanding requirements of the course.

Late Assignments

Assignments are to be submitted online and are due at the time indicated on the website. Late penalties (typically 10% per day late) are indicated in the details for the assignment. Extensions are awarded at the instructor's discretion. If you anticipate handing in an assignment late, please consult with your instructor beforehand.

Missed Exams/Quizzes/Labs

Make-up work is given at the discretion of the instructor. Normally, a score of zero will be given for a missed exam, test, quiz, lab, etc. In certain 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 (see below). The date and timing of any make-up option is at the discretion of the instructor. It may not be possible to reschedule certain labs, tests, or other activities.

A score of zero may be avoided when 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 severe personal crises. They do not include forgetting about the test, lack of preparation for the test, or 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 or, at the latest, on the day of the exam, test, quiz, lab, etc.
3. Evidence of the circumstances may be requested. Proper medical documentation of illness or injury may be required from a doctor.
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 regularly attending labs and lectures and turning in assignments in the course.

Attendance

Students are expected to attend all classes and associated activities. If classes are missed, it is the student's responsibility to become aware of all information given out in the classes or tutorials, including times of examinations and assignment deadlines.

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).

Professionalism

Students are expected to demonstrate a professional attitude and behaviour: reliability, respect for and cooperation with colleagues, willingness to work calmly and courteously, respect for equipment and systems, and constructive response to criticism.

Electronic Devices

Students may use electronic devices during class; however an instructor may ask for devices to be put away if they become a distraction to other students or interfere with classroom learning.

On-line Communication

Outside of the classroom, instructors will (if necessary) communicate with students using either their official Capilano University email or Moodle; please check both regularly. Official communication between Capilano University and students is delivered to students' Capilano University email addresses only.

UNIVERSITY OPERATIONAL DETAILS**Tools for Success**

Many services are available to support student success for Capilano University students. A central navigation point for all services can be found at: <http://www.capilanou.ca/services/>

Capilano University Security: download the [CapU Mobile Safety App](#)

Policy Statement (S2009-06)

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

Academic Integrity (S1999-01)

Any instance of academic dishonesty or breach of the standards of academic integrity is serious and students will be held accountable for their actions, whether acting alone or in a group. See policy S1999-01 for more information: <http://www.capilanou.ca/about/governance/policies/Policies/>

Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances, are prohibited and will be handled in accordance with the Student Academic Integrity Procedures.

Academic dishonesty is any act that breaches one or more of the principles of academic integrity. Acts of academic dishonesty may include but are not limited to the following types:

Cheating: Using or providing unauthorized aids, assistance or materials while preparing or completing assessments, or when completing practical work (in clinical, practicum, or lab settings), including but not limited to the following:

- Copying or attempting to copy the work of another during an assessment;
- Communicating work to another student during an examination;
- Using unauthorized aids, notes, or electronic devices or means during an examination;
- Unauthorized possession of an assessment or answer key; and/or,
- Submitting of a substantially similar assessment by two or more students, except in the case where such submission is specifically authorized by the instructor.

Fraud: Creation or use of falsified documents.

Misuse or misrepresentation of sources: Presenting source material in such a way as to distort its original purpose or implication(s); misattributing words, ideas, etc. to someone other than the original source; misrepresenting or manipulating research findings or data; and/or suppressing aspects of findings or data in order to present conclusions in a light other than the research, taken as a whole, would support.

Plagiarism: Presenting or submitting, as one's own work, the research, words, ideas, artistic imagery, arguments, calculations, illustrations, or diagrams of another person or persons without explicit or accurate citation or credit.

Self-Plagiarism: Submitting one's own work for credit in more than one course without the permission of the instructors, or re-submitting work, in whole or in part, for which credit has already been granted without permission of the instructors.

Prohibited Conduct: The following are examples of other conduct specifically prohibited:

- Taking unauthorized possession of the work of another student (for example, intercepting and removing such work from a photocopier or printer, or collecting the graded work of another student from a stack of papers);
- Falsifying one's own and/or other students' attendance in a course;
- Impersonating or allowing the impersonation of an individual;
- Modifying a graded assessment then submitting it for re-grading; or,
- Assisting or attempting to assist another person to commit any breach of academic integrity.

Sexual Violence and Misconduct

All Members of the University Community have the right to work, teach and study in an environment that is free from all forms of sexual violence and misconduct. Policy B401 defines sexual assault as follows:

Sexual assault is any form of sexual contact that occurs without ongoing and freely given consent, including the threat of sexual contact without consent. Sexual assault can be committed by a stranger, someone known to the survivor or an intimate partner.

Safety and security at the University are a priority and any form of sexual violence and misconduct will not be tolerated or condoned. The University expects all Students and Members of the University Community to abide by all laws and University policies, including [B.401 Sexual Violence and Misconduct Policy](#) and [B.401.1 Sexual Violence and Misconduct Procedure](#).

Emergencies: Students are expected to familiarise themselves with the emergency policies where appropriate and the emergency procedures posted on the wall of the classroom.