

**PHYS 110 – Introductory Physics I**  
**Course Outline: Jan 2022– Apr 2022**

Instructors: Dr M Laidlaw [laidlaw@uvic.ca](mailto:laidlaw@uvic.ca) (Primary contact)  
Dr T Martin [travismartin@uvic.ca](mailto:travismartin@uvic.ca)  
Please email us directly rather than using any LMS messaging function.  
Include PHYS 110 in the email subject and tell us your student number.

Lectures: A01 ELL 168 MR 1:00-2:20 Dr Laidlaw  
A02 & A03 ELL 061 TWF 11:30-12:20 Dr Laidlaw  
This course will be taught using a primarily “flipped” modality.  
Previously recorded lecture videos will be available to all students; you are expected to watch them. The live sessions will be an opportunity for the instructors to elaborate on the theory, applications, demonstrations, and examples as they consider appropriate.

Labs: There will be an online lab exercise the week of Jan 17.  
Further details about lab scheduling will be announced.

Prerequisite: MATH 100, 109, or 102 (MATH 102 is not recommended)  
To register in this class, you must have credit for, or be concurrently registered at UVic in a calculus class (MATH 100, 102, or 109).  
We expect that you have mastered equivalent material to BC Physics 12.

Required Texts:  
A textbook by Dr Keeler and Dr Laidlaw will be available electronically.  
A lab manual by Dr Martin will be available electronically.  
To access these resources and the assignments you must purchase the text.  
The purchase is done through the bookstore, and can be done online.

Other Required Supplies:  
To fulfill the requirements of this course you will need to ensure you have a computer, a working webcam, and a stable internet connection with enough bandwidth to support using applications such as Zoom.

In this course we will give an overview of, and teach the basic principles of, a number of areas of physics. You will learn to analyze physical systems and to identify the principles by which they operate. You will also learn to apply and interpret mathematical tools such as vectors, calculus, and symbolic manipulation to predict and understand the behavior of these systems. In the process we will stimulate your curiosity about the physical world and help you develop analytical thinking skills that you can apply in your future studies.

**Calendar Description:** Newton’s laws; particle dynamics and curvilinear motion; force and momentum; kinetic and potential energy; circular and rotational motion; gravitational and electric forces.

### **About this class and COVID-related uncertainties:**

Since the abrupt switch to online instruction in March of 2020 there have been a number of disruptions to teaching, including most recently the switch from face-to-face exams to online exams in December 2021. You may be feeling apprehension about the risk associated with being at close quarters with others, frustrated with any lingering restrictions on movement and association, or upset about the prospects of changes to course modality which are imposed by changes in the pandemic.

The instructors can make some commitments about how they will run this class, and can articulate some expectations of you.

The instructors promise that:

- If things stay more-or-less how they are at the start of the term you can rely on the syllabus to detail the major due dates and expectations in the course.
- If there is an unexpected and major change of circumstances we will modify the course requirements in the same spirit as the original course structure and communicate any changes clearly and promptly.
- The course website and offering will be structured so that even if you fall ill you will be able to access the core course content.
- The grading scheme and expectations will be flexible enough to accommodate transitory illnesses.
- We have plans for the return to in-person instruction, including labs, that accommodate various scenarios including delays of the restart date past Jan 24. We will communicate those plans as promptly as possible once we have the relevant information and direction.

We need you to do the following:

- We require that you follow all relevant provincial, university and faculty instructions about distancing, handwashing, masks, and similar issues.
- We require that you not attend any in-person course component if you are ill; students exhibiting any cold or flu-like symptoms will be asked to leave.
- We ask and expect that you wear a mask in all lecture, lab, and in-person exam settings.
- We ask that you make all reasonable effort to get vaccinated in a timely manner if you are not already vaccinated.

This term it is very likely that some students in this class will need to be absent because of transitory illness and UVic's return-to-campus guidelines which enjoin against attending class if experiencing symptoms consistent with respiratory infections. The course is designed to accommodate brief illnesses or isolation by providing content online and by the provision to omit some missed work from grading.

The way we are going to try and mitigate these obvious issues are by having policies which do not force you to attend when ill, and by requiring you to be cautious in the setting of all class activities.

## Grading

While we do not grade on a curve, in the past, courses like this have typically had roughly the following grade distribution:

A-range: 20%; B-range: 40%; C/D-range: 30%; F: 10%

There will be four evaluated components, these are described below.

### Final Exam:

**The final exam will be worth 50% or 60% depending on the weighting of the midterms.**

**There will be a final exam during the April exam period for all students.**

The exam will be offered in-person unless there are restrictions or orders which make it impossible to offer in-person exams.

The exam will be offered in a substantially similar format to the midterms; if there has not been at least one midterm offered in the same format as the final exam the instructors will make a representative exercise available to communicate the exam format.

The tentatively scheduled date for a deferred final exam is May 1.

The instructors will determine a minimum threshold on the final exam for passing, and a minimum threshold to be assigned a grade higher than “D”. These thresholds will not be higher than 40% and 50% respectively, and they will be based on the difficulty of the exam administered and its modality. Since the deferred exam will be different from the regular exam the thresholds may be different.

### Midterms:

**The midterms will be worth 20% or 10% as described below:**

There will be two midterms on Feb 14 and Mar 21. The midterms will be held [6:30-8:00], and will only be offered in-person unless there are restrictions or orders which make it impossible to offer in-person exams.

Each will be worth 10%. One midterm score will be replaced by the final exam score if that results in a higher overall score. This means that if you miss one midterm because of illness it is replaced by the final exam.

**Exceptional Cases:** Students who miss both midterms because of illness will write an online comprehensive midterm worth 10% on Apr 8. Others may apply for permission to write this midterm, permission will be granted for compelling reasons only. This midterm will be remotely proctored via Zoom.

The instructors will use their judgement about the difficulty of the exams and their modality to assess the performance of students. What this means is a score of 10/20 online and a score of 10/20 in person may not be treated exactly the same

way because the exams were different. This is necessary to make sure that the grades mean the same thing across exam types.

### **Assignments:**

#### **The assignments are worth 10% as described below:**

There are two ways you can earn assignment marks. You can do:

**Regular weekly assignments:** Roughly every week an assignment will come available. It will normally be due on the following Friday. These assignments follow exactly the pace of the course. We anticipate most students will be able to complete them in 3-4 hours. The best 10 of 11 assignments will be averaged to form your assignment mark.

Or:

**Asynchronous online quizzes:** Approximately every two weeks an asynchronously offered “quiz” will become available. If you have studied for these as you would for a midterm you should be able to do them in one hour. They will be time-limited to a maximum of two hours. The best 4 of 5 of these quizzes will be averaged to form your assignment mark.

In addition:

**Teaching Assignments:** Roughly every week a “teaching assignment” will come available. All teaching assignments will be due on Friday in last week of class. They take a variable amount of time to do, but are structured to assist your studying. We will calculate your average on all teaching assignments and will use that to replace up to 3 assignments and 1 quiz in the calculation of your assignment mark. This means that you have the opportunity to make up a quiz or assignment that you miss because of illness, conflict of commitment, or other issue.

All assignments will be administered through the Webwork system.

The purpose of the assignments is to encourage and assess your continuing engagement with the course material. Since this continuing engagement is an essential process in the course, and as there are some alternatives in the grading scheme, we will not consider modifications of the due dates.

Students who work on the assignments regularly and use them as a tool to identify and practice the processes we teach in this course are, in our experience, much more likely to do well in the course.

### **Labs:**

#### **The labs are worth 20% as described below:**

Your labs start on with an online exercise the week of Jan 17; there will be a second online exercise the week of Jan 24. UVic’s transition to in-person instruction anticipates resumption of on-campus activities on Jan 24, and in that scenario there will be an in-person lab meeting that week. If in-person instruction is delayed past Jan 24 more lab exercises will be held online; we will communicate about their schedule as events dictate.

You will have between 6 and 8 assessed activities. Your mark will omit one of those grades in a way which maximizes your score.

You will normally undertake the in-person lab activities in pairs and take data during the lab period. You will submit your lab work on the BrightSpace website. To be eligible for marking your work must include documentation of your data and also be substantially distinct from the work of other students; you may not submit the same work as your lab partner. Submitting the same work as another student is addressed by the grading criteria to provide an education opportunity about academic integrity, however incidents may also be addressed under the academic integrity policy.

If you are ill at the time of an in-person lab you may not attend. Your lab instructors have permission to refuse entry to any student who appears to be sick. It is your responsibility to contact the course instructors promptly if you miss a lab because of illness; if you do not contact us we will presume you missed for another reason.

- If you do not attend one lab because of illness you are accommodated by the grade being calculated omitting one of the labs.
- If you do not attend two or more labs because of illness you may be offered the opportunity to make up one lab in-person at the end of the term. The instructors will contact you about this in late March.
- If you miss three or more labs because of illness it will not be possible to fully accommodate you. You may be eligible to apply to withdraw from the course as long-duration illness has prevented you from fully participating.

**Lab exemptions:** To be eligible for a lab exemption you must have completed the labs in the Sept 2020 term or later. You must have submitted all, or all but one, of the labs and attained a score of 70% or higher on our grading rubric. If you fit into this category you may apply prior to Jan 21 to submit a summative lab exercise which will count as your lab score.

**It is a University regulation that to pass the course you must pass the labs. Any student with unsatisfactory standing in the labs will not be able to write the final exam and will be assigned the grade “0% F”.**

We have structured this grading scheme to be flexible against the higher-than-normal background of illness and absence that we anticipate.

If you fall ill and miss a course component we need you to contact us promptly.

For most cases, the grading scheme’s provision to omit one or more of each component will be all the accommodation we need to give.

## **Academic Integrity and Professional Conduct**

The instructors take Academic Integrity and Professionalism in this course extremely seriously.

You can find UVic's Policy on Academic Integrity in the Calendar; [here is a link](#).

You can find the code of professional conduct for the Faculty of Science [here](#).

In overview, your responsibilities are:

- For the final exam you must complete all work on your own without help from another person or from any outside sources.
- For the quizzes you must complete all work on your own without help from another person or from any outside sources.
- For the labs you must submit your own original work. You may seek help or advice from an instructor or another student. You may not copy or paraphrase from another student, and you may not permit your work to be copied or paraphrased by another student.
- For the assignments you must undertake the work yourself. You may seek advice or help from an instructor, other students, a tutor, or other person, but you are responsible for understanding and undertaking the work you submitted.
- It is a violation of UVic policies about information technology and intellectual property to post material from this class to any online site. If you make such posts you may lose access to course materials while the situation is investigated.

The instructors are taking several active and passive measures to monitor the course to maintain the integrity of the course.

Any online exams will be remotely supervised. You will be required to log in to Zoom through your UVic account and turn on your webcam showing yourself and the area surrounding you as you work. If you do not participate in the remote proctoring your grade for that course element will be set to 0.

The online assignments and midterms will require you to provide numerical answers to questions. The questions will be marked based on whether the numerical answer is close to the correct numerical answer. The numbers in the questions you must answer will be randomized.

For online midterms you will be required to submit your rough work. In assessing work, instructors may require a student to support answers submitted on quizzes and the final exam. Examples of the kind of support that may be required include written solutions leading to the submitted answer, or the requirement to verbally explain the reasoning to the same, or substantially similar, problems.

If the instructors have a reasonable apprehension that an academic integrity violation has occurred they will forward it to their Chair as outlined in the Policy on Academic Integrity.

## **Studies being done on this course**

### **#1 - Assignments**

Assignment completion rates and behaviour in this course will be the subject of a study conducted by Mark Laidlaw and Richard Keeler. The purpose of this research is to

- Measure the percentage of students who complete the assigned homework
- Quantify the relationship between homework completion habits and assigned final grades.
- Assess the viability of different methods of automated assessment

The data collected include your score on individual assignments and the times at which you accessed and answered individual assignment items.

The anticipated benefit is to demonstrate whether assignments can be administered through UVic's CourseSpaces system, and to identify assignment completion habits correlated with success so they can be taught to future class sections. The data used in the study will be anonymous. The use of your data will not affect your mark in any way; no analysis will be done before grades are finalized.

Your data will be processed as follows: Using the student number, final grades will be associated with scores on each assignment and the times the assignment items were accessed. All identifying features such as student number are then removed from the data.

If you have questions about the methods and goals of the research, about how your data will be used, or about the use of your data, please contact Mark Laidlaw by email at [laidlaw@uvic.ca](mailto:laidlaw@uvic.ca). You may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or [ethics@uvic.ca](mailto:ethics@uvic.ca)).

### **#2 – Exams**

Exam results in this course will be the subject of a study conducted by Mark Laidlaw.

The object of the study is to characterize the difficulty of exam questions. The anticipated benefits of the study are to help standardize course grades from year to year, and to improve question design. The data used in the study will be anonymous and will be statistical in nature (for example: 53% of students who got a "B" answered question 20 correctly). The use of your exam data will not affect your mark in any way, as no analysis will be done before grades are finalized. You will receive a follow-up email with more details after the completion of the course. If you have questions about the methods and goals of the research, or about how your data will be used, please contact Mark Laidlaw by email at [laidlaw@uvic.ca](mailto:laidlaw@uvic.ca).

You may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or [ethics@uvic.ca](mailto:ethics@uvic.ca)).

## Schedule

Lectures and Assignments	Videos Available	Assignment due
Vectors	Jan 10	Jan 21
Translational Equilibrium	Jan 17	Jan 28
Rotational Equilibrium	Jan 24	Feb 4
Velocity and Acceleration	Jan 31	Feb 11
Second Law	Feb 7	Feb 18
Fundamental Forces	Feb 14	Mar 4
Momentum	Feb 28	Mar 11
Angular Momentum	Mar 7	Mar 18
Work and Energy	Mar 14	Mar 25
Conservation	Mar 21	Apr 1
DC circuits	Mar 28	Apr 8

Online Quiz	Dates Available	Topic	Topic
Quiz 1	Jan 31 – Feb 4	Vectors	Trans. Equilibrium
Quiz 2	Feb 14 – Feb 18	Rot. Equilibrium	Velocity and accel.
Quiz 3	Mar 7 – Mar 11	Second Law	Fund. Forces
Quiz 4	Mar 21 – Mar 25	Momentum	Ang. Momentum
Quiz 5	Apr 4 – Apr 8	Work and Energy	Conservation

The lab schedule will be announced via the Announcements tool on BrightSpace.

**Midterm 1: Feb 14** Vectors, Translational Equilibrium, Rotational Equilibrium, Velocity and Acceleration.

**Midterm 2: Mar 21** Second Law, Fundamental Forces, Momentum, Angular Momentum

**Alternative Midterm: Apr 8 online.** Same topics as Midterm 1 and Midterm 2.