**PHYS 111 – Introductory Physics II**
**Course Outline:  Jan 2026 – Apr 2026**

Instructors:      Mark Laidlaw                    laidlaw@uvic.ca
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                Thomas Baker                    bakerte@uvic.ca
                Please email us directly rather than using any LMS messaging function.
                Include PHYS 111 in the email subject and tell us your student number.

Lectures:

| | | | |
|---|---|---|---|
| A01 | TWF 10:30-11:20 | Mark Laidlaw |
| A02 | TWF 11:30-12:30 | Thomas Baker |
| A03 | TWF 1:30-2:20 | John Coffey |
| A04 online | asynchronous | Mark Laidlaw |

Previously recorded lecture videos will be available to all students; you are expected to watch them.  The in-person sessions will be an opportunity for the instructors to elaborate on the theory, applications, demonstrations, and examples as they consider appropriate.

Labs:      In-person lab sessions will be held starting on Jan 5.
      You must attend your lab section; there is marked work starting Jan 5.
      All students will complete their labs in person.

Prerequisite:   PHYS 110.
      To register in this class you must also have credit for, or be concurrently registered at UVic in a calculus class (MATH 100, 102, or 109).
      We will teach this course assuming you are taking MATH 101.

Required Texts:
      A workbook, lab manual, and other course resources by Dr Keeler, Dr Laidlaw, and 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.
      As some of the course work, including labs, must be done online it is essential that you arrange access prior to Jan 9.

Other Required Supplies:
      To fulfill the requirements of this course you will need to ensure you have a computer.  In the unlikely event of mandated online exams you will need 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**: Heat engines; harmonic motion; wave motion; geometric and wave optics; modern physics.

## Modality and Assessment Design:

The modality of instruction in this course is primarily face-to-face for sections A01, A02, and A03, and online with some face-to-face for section A04.
<u>There are some course elements that can only be completed in-person: (1) the labs, (2) the midterm assessments, and (3) the final exam.</u>

Evaluation in this course is planned through the lens of "universal design".  The instructors have assessed the essential learning goals of the course and made a determination about how and where flexibility can be offered and articulated it clearly for everybody.  The provisions (detailed below) which allows some omission or substitution of work are intended as a full and reasonable accommodation for issues such as illness, conflict of commitment, unexpected adverse circumstances, or episodic productivity issues.  They are intended and will be used as a "first resort" for all cases, and in nearly all cases will be all the provision necessary.

The following provisions apply to all students:
- One midterm may be replaced by the final exam if the final exam score is higher. This means that if you miss one midterm it is automatically replaced by the final exam.
- If you miss both midterms you will be given the opportunity to write an exam to replace one midterm near the end of the term.  The other is replaced by the final.
- Your lab score will be based on the best 5 (of 6) lab submissions.
- If you miss two or three labs because of illness or conflict of commitment you will be offered a single makeup lab at the end of the term.
- Up to three assignment marks can be replaced by the mark on the corresponding "teaching assignment", and after that replacement has been done your assignment score will be based on the best 10 (of 11) assignment submissions.

If you anticipate missing an in-person course element (particularly a lab session) because of illness or conflict of commitment you must email the instructors promptly so we can record the information.

If there is an unexpected and major change of circumstances the instructors will modify the course requirements in the same spirit as the original course structure and communicate any changes clearly and promptly.  In particular, all exams are anticipated to be in person unless it is impossible to do so.

We ask that you not attend any in-person course component if you are ill; students exhibiting any cold or flu-like symptoms may be asked to leave.

## 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%

The essential elements of the course are: (1) the final exam, and (2) submission of a minimum of 4 labs.  Students who complete both of these are considered to have made a complete attempt at the course and will be assigned a final letter grade.

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 an in-person final exam during the April exam period for all students.**  This exam will be similar in format to the midterms, and it will be comprehensive.  The final exam is a required course element; students who do not write the final exam will be assigned the grade "0% N" unless they are otherwise debarred from writing the final exam.

**A deferred exam to accommodate students who are ill or have other issues is tentatively scheduled for Monday May 4.**

To be eligible to pass the course students must have minimally acceptable performance on the final exam ("must pass"), and to be eligible to attain a C or above students must have adequate performance on the final exam.  The instructors will use their judgement to determine what constitutes both minimally acceptable and adequate performance.  The threshold to "pass" the exam will be at most 40%, and the threshold for "adequate performance" will be at most 50%.  Since the deferred exam will be different from the regular exam its thresholds may be different.

**Midterms:**

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

There will be two midterms on Sat Feb 7 and Sat Mar 14.  Both midterms will start at 2:00pm and have a benchmark length of 90 minutes.  Their locations will be announced.  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 it is replaced by the final exam.  If you miss a midterm for any reason you need to contact us promptly to document the reason.

Students who miss both midterms because of illness or conflict of commitment will write a midterm worth 10% on Apr 2 at 9:00am.

**Assignments**:

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

**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; up to three assignments may be replaced by the corresponding "Teaching Assignments"

**Teaching Assignments:** Roughly every week a "teaching assignment" will come available. All teaching assignments will be due on April 3. They take a variable amount of time to do, but are structured to assist your studying. They may replace up to 3 assignments in the calculation of your assignment mark. This means that you have the opportunity to make up a 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. <u>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.</u>
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:**

You will be responsible for 6 lab submissions. Your grade in the labs will be based on the best 5 of 6 lab submissions. Submission of a minimum of 4 labs is a required course element. Students who do not attend and submit at least 4 labs will be assigned the grade "0% N" and debarred from writing the final exam. Only labs submitted through Brightspace prior to the deadline and in the proper format will be marked.

Your labs start with an introductory session in the period Jan 5 – Jan 9. At this session you will get instructions about your future lab schedule, further information about the expectations for the labs. The first lab exercise will require analysis of data provided online through the WebWork system.

For the remainder of the labs you will 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 you must attend the lab session, include documentation of your data, and be substantially distinct from the work of other students. You may not submit the same work as your lab partner. You may not submit work you or another person has done in a previous term. 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 may 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, conflict of commitment, or unexpected significant circumstances; 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 <u>one</u> lab in-person on Apr 2, 3, or 4. The instructors will contact you about this by Mar 31.
- 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.

If you fall ill or for any reason are unable to fully complete an individual lab writeup you are expected to submit what you have completed because you had time available during the lab to work on it; our provision of makeup opportunities is for students who cannot attend the lab session because of illness.

**Lab exemptions:** Some students are eligible to apply for exemption from the lab portion of the course. The eligibility requirements are:

- Have a recorded final grade in the course from Sept 2020 or later.
- Submitted all, or all but one, of the labs in that attempt.
- Was assigned an average score of 70% or higher on the labs.
- Registration in lab B27

Applications must be made prior to Jan 9.

If you apply and are eligible you will be registered in B27 and given a lab test to complete on Jan 10. Your score on this will form your lab grade. After completing the lab test you may elect to register in a regular lab and complete the rest of the labs, in which case this test will replace your grade for lab 1.

**<u>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".</u>**

**Academic Integrity**

The instructors take Academic Integrity in this course extremely seriously.
You can find UVic's Policy on Academic Integrity in the Calendar; here is a link.

In overview, your responsibilities are:
- For the final exam you must complete all work on your own without help from another person or from outside sources.
- For the quizzes you must complete all work on your own without help from another person or from 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. 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.
- Note that it is an academic integrity violation and a violation of UVic policies about information technology to post material from this class to any online "homework help" site.

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

In the unlikely event that an exam must take place online it 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 exams if applicable) 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. If an exam must be held online you will be required to submit your rough work. In assessing this work, instructors may require a student to support answers submitted. 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.  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).

## #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.

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).

**#3 – Exam Completion Times**

Exam completion times and grading outcomes of this course are the subject of a study being conducted by Dr. Mark Laidlaw and Dr. Travis Martin. The purpose of this research is to characterize student exam submission behaviours, and examine how they correlate with student performance. One of the factors that will be tested includes the maximum duration assigned, which may imply status as a student with extended time accommodations. The anticipated benefit of this is to provide guidance data for academic administrators in determining policies on universal design.*

The data on completion times and durations will be kept separate from performance data until after the course has ended and final grades have been submitted. Furthermore, the analysis of the exam completion times and grades for students in this course will be performed using anonymized data, free of student names and student ID numbers, after the completion of the course and submission of final grades. The use of the data, and any collected timing data, will not affect your grade in any way.

Students may opt out of having their data analyzed for this study by sending an email to Dr. Mark Laidlaw or Dr. Travis Martin. Opting out of the analysis will in no way affect performance in the course.

If you have any questions about how your data will be used, or details about the study, you may contact the Data Steward, Dr. B.C. Choi, (phastchair@uvic.ca), or you may contact the researchers, Dr. Travis Martin (travismartin@uvic.ca) and Dr. Mark Laidlaw (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).

*Note: Universal Design is a modern pedagogical approach to address accessibility in courses. The approach argues that courses should be designed such that the environment and course policies should be equally usable by all people, regardless of ability or disability, as much as possible. There are many approaches for implementing Universal Design in courses, and these methods vary across disciplines.

| Lectures and Assignments | Videos Available | Assignment due |
|---|---|---|
| Harmonic Motion | Jan 5– Jan 19 | Jan 16 |
| Coupled Oscillations/Waves | Jan 12 – Jan 26 | Jan 23 |
| Standing Waves | Jan 19 – Feb 2 | Jan 30 |
| Wave applications | Jan 26 – Feb 9 | Feb 6 |
| Collective Variables | Feb 2 – Feb 23 | Feb 13 |
| Calorimetry | Feb 9 – Mar 2 | Feb 27 |
| First Law | Feb 23 – Mar 9 | Mar 6 |
| Second Law | Mar 2 – Mar 16 | Mar 13 |
| Geometric Optics | Mar 9 – Mar 23 | Mar 20 |
| Relativity | Mar 16 – Mar 30 | Mar 27 |
| Modern Physics | Mar 23 – Apr 6 | Apr 3 |

Please note that the lecture videos will cease to be available on the dates described above. You are expected to watch them and take notes as part of your ongoing engagement with the course. Your course notes and the text materials will be your primary sources for review material.

| In Person Labs | Dates (Odd) | Report due | Dates (Even) | Report due |
|---|---|---|---|---|
| Lab 1 Review Test | Jan 5 – Jan 9 | Jan 15 | Jan 5 – Jan 9 | Jan 15 |
| Lab 2 Graphical Analysis | Jan 12 – Jan 16 | Jan 22 | Jan 19 – Jan 23 | Jan 29 |
| Lab 3 Modelling Resonance | Jan 26 – Jan 30 | Feb 5 | Feb 2 – Feb 6 | Feb 12 |
| Lab 4 Power Dependence | Feb 9 – Feb 13 | Feb 26 | Feb 23 – Feb 27 | Mar 5 |
| Lab 5 Assumptions and Approximations | Mar 2 – Mar 6 | Mar 12 | Mar 9 – Mar 13 | Mar 19 |
| Lab 6 Exponential Linearization | Mar 16 – Mar 20 | Mar 26 | Mar 23 – Mar 27 | Apr 2 |

**Midterm 1:  Feb 7**  Harmonic Motion, Coupled Oscillations, Waves, Standing Waves, Wave Applications
**Midterm 2:  Mar 14**  Collective Variables, Calorimetry, First Law, Second Law
**Midterm 3:  Apr 2**  Geometric Optics, Relativity, Modern Physics
Midterm 3 is only offered to students who miss both Midterms 1 and 2.

Any concerns about grading must be brought forward promptly: normally concerns brought later than 7 days after the release of the grade will not be entertained.