

PHYC11H3 Syllabus – Winter 2022

Intermediate Physics Laboratory II

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Office Hours: By appointment

General description

The main objective of this course is to help students develop skills in experimental physics by introducing them to a range of important measuring techniques and associated physical phenomena. Students can perform experiments in physics involving electricity and magnetism, optics, solid state physics, atomic and nuclear physics.

Prerequisite: PHYB10H3, PHYB21H3, PHYB52H3 Exclusion: (PHYB11H3)

Course organization: 1 hour of lecture, 3 hours of laboratory time every week.

Lectures: Tuesdays, 12 noon – 1 PM, BV 361

Laboratory sessions: SW 505 B (or others, as assigned – see Quercus)

PRA01:	Tuesday	2 PM – 5 PM
PRA02:	Wednesday	12 PM – 3 PM

COVID Course Delivery Impact

Due to the COVID pandemic, lectures will take place online during the month of January using Zoom. An announcement will be made about lecture section delivery thereafter, which will depend on pandemic conditions.

Labs will be delivered in person starting the week of January 31.

COVID safety policies and procedures

This course will be delivered in person. Due to the ongoing COVID pandemic a variety of safety protocols will be in place. They will be strictly enforced. Students will be asked and required to leave if they fail to follow COVID safety policies.

Masks: Medical masks must be worn at all times during laboratory sessions.

UCheck: students must submit a [UCheck](#) prior to arriving every time they come to campus.

Physical distancing: Keep 2 meters distance between people at all times.

Workspaces: Each student will be assigned a workspace and equipment. This will be posted to Quercus.

Do not come to campus if you have COVID symptoms or have tested positive for COVID.

Course Evaluation

Course policy quiz:	1%
Lectures quiz:	4%
Assignment:	10%
Formal lab report 1:	25%
Formal lab report 2:	25%
Oral presentation:	20%
Peer review:	15%

Note: there is no final exam.

Questions and email policy

My email policy is to respond within two business days. Students must send email from their official U of T email address. Others may not pass filtering.

Students must include PHYC11 in the email subject and provide your full name and student number in the body of your message.

Students are encouraged to make use of the Quercus Discussions boards for questions that may be of interest to other students.

Absences

There are no make-up options for practicals or quizzes.

In the event of legitimate medical absences, students must submit an ACORN self-declaration of illness ([information](#)) AND submit the DPES Student Absence Form ([here](#)).

In the case of an appropriately documented absence, an accommodation can be discussed with the instructor.

Requesting experiments

There are a limited number of experiments available for students.

Students must submit their preference for experiments in advance. This will take the form of a ranked list with at least three choices. This is critical because students need to prepare, which they cannot do until they know with certainty which experiment they are doing. A student's first (or even second) choice experiment might not be available.

Last-minute requests might not be accepted, resulting in the loss of that week's lab time.

Course Structure

Summary

The focus of the course is on experiments conducted in the labs. Students are typically required to perform three experiments. Due to the more limited time available for labs this term, two experiments will be required.

- For each experiment conducted, a formal laboratory report must be independently written and submitted by the deadlines.
- For the first experiment, there will be a graded peer review.
- Each student will give an oral presentation about one of the experiments they performed. The selection of experiment to be presented requires instructor approval.
- There will be a quiz covering the course policies (primarily the syllabus) as well as a quiz covering content delivered during lectures.
- There will be an assignment about data plotting.

Lab reports (25% each)

The lab report should communicate all major aspects of the experiment and follow standard sections, e.g., introduction, experimental method, results, discussion, and conclusions.

- Lab reports should be 5 – 10 pages in length and use 11 or 12-point font, single line spacing, and normal page margins.
- A well-organized document with excellent spelling and grammar is expected.
- Figures (data plots) made using Excel will not be graded favourably; figures should be made in Python or an equivalent language.
- Tables and figures need captions.
- It is expected that students will reference (cite) at least two articles from the literature that provide relevant connections and/or background to the experiment being conducted.

Submission of a lab report

Reports must be submitted to Quercus Assignment as a PDF document.

The file name must follow this convention:

PHYC11_YYYY_Lab#_LASTNAME-FIRSTNAME_BRIEFTITLE.PDF

where YYYY is the current calendar year, the Lab# refers to whether it is your 1st, 2nd, or 3rd lab of the term, and there is a very short title, e.g., “speed-of-light”.

Failing to follow these file submission instructions will result in a 2% penalty on the report.

Late submissions will be subject to a penalty of $N^3\%$, where N is the number of days late.

Requests for review or regrading of any work must include specific written comments, arguments, or concerns explaining why the student believes reconsideration of the grade is justified. This must be submitted to the instructor by email within one week of the work being returned.

Peer Review (15%)

The first lab report will involve a peer review process. This is intended to provide students with feedback that helps improve their submitted work. The quality of the feedback will be evaluated and be worth 10% of the course grade. The review process will be anonymous and facilitated by the PeerScholar system.

It is critical that the second lab report be submitted by the deadline. Otherwise, the student will not be able to participate in the peer review process and lose the 15% value of that course component.

Students will also have to write a response – a letter to the editor – outlining the changes they made as a result of the peer review and why. This will be graded and worth 5% of the course grade.

Presentations (20%)

Each student will be required to give an oral presentation on one of the experiments to the instructor and other students. The selection of which experiment will be presented requires instructor approval.

The presentations will take place during the lecture sessions of the course. [These presentations should be 10 minutes in length](#) with five minutes for questions and discussion. This time will be strictly enforced. Timeslots for presentations will be booked on a first-come first-serve basis.

Quizzes (5%)

There will be an online Quercus Quiz about the course policies and syllabus at the start of term.

There will be a quiz scheduled at the end of the term. It will cover the lecture content, primarily the student lecture talks. Sometimes, audience (student) questions to the presenter are used as quiz questions.

Assignment (10%)

There will be an assignment about simple data plotting using python. Details will be posted to Quercus.

Independence & Responsibility

There is a greater degree of independence required in this course relative to other undergraduate courses you have taken. You are expected to manage your own lab time and ensure that the requirements of the course are met. For example, you are required to submit requests for starting a new experiment in advance. You are also required to book a presentation slot, which are given on a first-come first-serve basis.

**I will not chase you.
If you miss deadlines or fail to submit work,
you will simply lose that opportunity to get marks.**

Working in the physics laboratory

- When students arrive, the instructor will assess that they are properly prepared.
- During the laboratory session, the instructor may ask students about background, progress, and understanding of the experiment being conducted.
- Each student's lab notebook will be examined when the student signs out. The following week's experiment will also be arranged with the instructor.

The experiment manuals (and additional documents, as appropriate) will be posted to the Quercus course page. Students are expected to plan their experiment and arrive having read the documentation.

If students finish their experiment before the end of a lab session, they can either work on their report or leave. It is not a problem if students wish to leave before the end of the session; however, they must inform the instructor. This is for safety.

Students must return equipment and the workspace to a clean and tidy condition before departing the lab session for the day.

Students must record all measurements and observations, as well as a description of what you do in the laboratory. It is recommended that students do so using a hardbound laboratory notebook. All readings, even preliminary ones, should be recorded. If some content is determined to be incorrect, you should write a note next to them explaining why. Never erase anything from your lab book.

Calculations and answers to questions asked in the lab manual should also be recorded. These are useful guides to what should be included in the lab report.

It is strongly advised that students plot their data as they proceed through the experiment. This will help identify potential issues with the equipment or understanding.

Lab books should be sufficiently detailed to allow the student – or someone else – to read it months later and clearly understand what was done. These records will form the basis for the formal lab report.

Course schedule

Note: students will progress through experiments at different rates. The lab session schedule below is approximate.

Week	Dates	Lab session	Lecture	Due Dates
1	Jan. 10 – 14	None	Course introduction	Course policy quiz (Jan. 16)
2	Jan. 17 – 21	None	Q&A during lecture about expectations	Lab 1 preferences (Jan. 23)
3	Jan. 24 – 28	None	Lecture discussion about reports	Data assignment (Jan.30)
4	Jan. 31 – Feb. 4	Lab 1		
5	Feb. 07 – 11	Lab 1		
6	Feb. 14 – 18	Lab 1		
Reading week				Lab report 1 submitted to peer review Feb. 27
7	Feb. 28 – Mar. 4	Optional	None	Peer Review (March 6)
8	Mar. 07 – 11	Lab 2	Student presentations	Final Lab Report 1 and Letter to Editor (March 13)
9	Mar. 14 – 18	Lab 2	Student presentations	
10	Mar. 21 – 25	Lab 2	Student presentations	
11	Mar. 28 – Apr. 01	Lab 2 (optional)	Student presentations	
12	Apr. 04 – 08	Student presentations	Student presentations	Lab Report 2 (April 8); Quiz on talks (April 8)

Relevant U of T Policies

Academic Integrity

The University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.

Details: <http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>

Potential offences in papers and assignments include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment.

On tests and exams cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

Recordings

Recording or photographing any aspect of a university course - lecture, tutorial, seminar, lab, etc. – without prior approval of all involved and with written approval from the instructor is not permitted. In the case of private use by students with disabilities, the instructor's consent will not be unreasonably withheld.

Accessibility

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the *AccessAbility* Services as soon as possible.

AccessAbility Services staff (located in room AA142) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email ability@utsc.utoronto.ca. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.