

PHYB10H3 Syllabus – Fall 2022

Intermediate Physics Laboratory I

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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 experimental and theoretical study of AC and DC circuits with applications to measurements using electronic instrumentation. Practical examples are used to illustrate physical systems.

Pre-requisites: PHYA21H3, [MATA36H3 or MATA37H3]

Co-requisites: MATB41H3

Course organization

Lectures: Tuesdays 11 AM – 12 noon in BV 260

Laboratory sessions: SW 505 B

PRA01:	Tuesday	12 PM – 3 PM
PRA02:	Wednesday	11 AM – 2 PM
PRA03:	Friday	10 AM – 1 PM

COVID

Due to the ongoing COVID pandemic, the use of medical masks continues to be strongly encouraged at U of T Scarborough in indoor settings.

Students are strongly encouraged to wear a medical mask while in lecture and practical (and surrounding hallways) to support the health and safety of our community, e.g., staff, TAs, students, and people with health risks.

Questions & Email policy

You can use the discussion board on Quercus to ask questions about the course and its content. My email policy is to respond within two business days. Students must include PHYB10 in the email subject and provide their full name and student number in their message.

If there are questions that are not appropriate for this forum, send email to me [using your official utoronto.ca email address](mailto:dan.weaver@utoronto.ca) – other addresses are filtered out automatically.

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Students must include the course code, PHYB10, in the email subject and provide your full name and student number in the text of your message.

My email policy is to respond within two business days. Plan accordingly.

Course Evaluation

Labs (4):	48% (12% each)
Project:	30%
Research & Writing Assignment:	16%
Quizzes (2):	6%

Note: There is no final exam for this course.

Requests for re-grading of any coursework must be submitted to the TA and/or instructor within one week of being returned. **It must include a written explanation** about why the student thinks a specific aspect deserves a different grade. Any aspect of the work may be re-evaluated. The revised grade may be greater than, equal to, or less than the original grade.

Absences

There are no make-up options for lab time 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](#)).

Course structure

Experiments (48%)

For each of the four experiments, each pair of students must submit a summary of the experiment and answers to the analysis questions.

Project (30%)

Each pair of students will apply their knowledge and skills to create an instrument. This will be used to acquire real-world data. A report will be written that describes how the instrument works, making specific reference to ideas covered in the course, what the data is and what it means, and comments on future extensions or changes that could be made to the instrument design.

Project options and more details about expectations will be posted to Quercus.

Bonus (2%)

The projects will involve components that are fabricated using the UTSC Library's 3D printer. These components can be provided to students by the lab technician. However, if students wish to learn to use the 3D printer and produce their own component, they will receive a 2% bonus on the course grade.

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Lab and Project Submission Instructions

Lab and Project reports must be submitted to Quercus Assignments as a PDF document. Other file types are not accepted.

When submitting the electronic copy of your report, the file format must follow this convention:

PHYB10_YYYY_Lab#_LASTNAME1-LASTNAME2.PDF

where YYYY is the current year, Lab# refers to whether it is lab 1, 2, 3, or 4 of the term (e.g., Lab1). LASTNAME1 and LASTNAME2 are the last names of the two students.

For the project, replace Lab# with Project-Name where Name is a single word representing the instrument that was built.

* Failing to follow submission instructions will result in a 2% penalty. *

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

Writing Assignment (16%)

The purpose of the research and writing assignment is for students to research and communicate the important details of a physics experiment. Students will research the details of the experiment, including – at minimum – two scientific journal article citations, and write a plain-language version of its purpose, method, data, and outcomes.

There will be an anonymous peer review process facilitated by PeerScholar. Students will provide feedback to two of their peers. The quality of this feedback will be graded and worth 6%.

The final assignment submission will be worth 10%.

Further details about this assignment will be posted to an assignment document on Quercus.

Students are encouraged to seek out and use the resources at the UTSC Library.

Quizzes (6%)

There will be two quizzes during the term. Each will be worth 3% of the final grade.

The quizzes will take place in class and cover content from the lectures and the lab documents.

Course Schedule (tentative)

Week	Dates	Lecture Topic (tentative)	Lab session topic	Work Due [date]
1	Sept. 06 – 09	Course introduction	None	
2	Sept. 12 – 16	DC Circuits	Lab 1: Circuits and Thermistor	
3	Sept. 19 – 23	Filters	Lab 1: Circuits and Thermistor	
4	Sept. 26 – 30	AC Circuits	Lab 2: Filters	Lab 1 [Oct. 02]
5	Oct. 3 – 7	Diodes	Lab 2: Filters	Writing assignment to PeerScholar [Oct. 09]
Reading Week				
6	Oct. 17 – 21	3D Printing	Lab 3: Semi-conductors	Lab 2 [Oct. 23]
7	Oct. 24 – 28	Quiz 1	Lab 3: Semi-conductors	Peer reviews [Oct. 30]
8	Oct. 31 – Nov. 04	Amplification I	Lab 4: Amplifiers	Lab 3 [Nov. 06]
9	Nov. 07 – 11	Amplification II	Lab 4: Amplifiers	Final Writing Assignment [Nov. 13]
10	Nov. 14 – 18	Projects Discussion	Projects: Building	Lab 4 [Nov. 20]
11	Nov. 21 – 25	Quiz 2	Projects: Data	
12	Nov. 28 – Dec. 02	Projects Discussion	Projects: Writing	Project [Dec. 05]

Working in the physics laboratory

BACK UP ALL DATA.

Arrive prepared

During the laboratory session, the instructor may ask students about background, progress, and understanding of the experiment being conducted.

The guide documents for the experiments will be posted to the Quercus course page.

Students are expected to review the experiment before the laboratory session.

If there are questions or a problem with any equipment, the lab technician, TA, or instructor should be consulted.

Respect the equipment and lab space

Food and water are prohibited in the laboratory rooms. If you need a drink of water you may leave the room to do so in an appropriate space outside the physics area.

The final 10 minutes of the lab session must be used to return the equipment to the state it was found in (or better). Do not wait until the session is over to clean up your workspace.

Failure to leave equipment in good condition and the workspace in a clean and tidy manner will result in the loss of 1% of the overall course grade (each instance). This will be enforced.

Lab books

It is recommended that students record all measurements and observations, as well as a description of what you do in the laboratory in 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.

Lab books must be sufficiently detailed to allow you – or someone else – to read it months later and clearly understand what you did. These records will form the basis for your lab reports.

Technical problems

If there are technical issues related to U of T tools, e.g., access to Quercus, please contact:

helpdesk@utsc.utoronto.ca

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.