

PHYB10H3 Syllabus – Fall 2019

Intermediate Physics Laboratory I

Instructor: Prof. Dan Weaver
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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.

Prerequisite: PHYA21H3, [MATA36H3 or MATA37H3]

Corequisite: MATB41H3

Exclusion: (PHYB23H3)

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

Lectures: Wednesdays, 10 AM – 11 AM, HL B110

Laboratory sessions: SW 505 B

- Session 1: Wednesdays 11 AM – 2 PM
- Session 2: Tuesdays 11 AM – 2 PM
- Session 3: Fridays 10 AM – 1 PM

Course Evaluation:

Formal lab reports (3):	75% (25% each)
Journal paper assignment:	10%
Quiz:	10%
Lab participation:	5%

Email policy:

You can use the discussion board on Quercus to ask questions about the course and its content. Other students may offer helpful advice and suggestions.

My email policy is to respond within two business days.

Please include PHYB10 in the email subject and provide your full name and student number in your message.

Course structure:

Students will be required to do three experiments, working in pairs:

1. All students are required to complete the *DC Circuits and Measurements* lab.
2. All students are required to complete the *Diodes and Rectifiers* lab.
3. Students may complete either the *Wave Filters* or *Amplifiers* lab.

For each experiment, a formal laboratory report must be submitted by the deadlines listed in the course schedule. Each student pair must independently produce a lab report.

- The report shall be 5 – 10 pages in length and use 12-point font, single line spacing, and 2 cm page margins.
- Student are not permitted to work with the same student for all three experiments
- Reports produced using LaTeX will be given a 2.5% bonus.
- Reports with figures produced using python will be given a 2.5% bonus. (*Submit code.*)

Late laboratory report submissions will be subject to a penalty of 15% per day.

Reports must be submitted to the instructor in person at the beginning of a lecture *and* submitted by email as a PDF document.

Due dates correspond to that week's lecture session. Late submissions can be emailed for time stamping purposes, provided a printed copy is submitted to the instructor within one week or at the next lecture/lab session, whichever is sooner. Early submissions are welcome.

Students may not begin a new experiment until the report for the previous experiment has been submitted.

Course schedule: *(tentative)*

Week	Lab session	Lecture
Week 1 (Sept. 02)	None	Course introduction
Week 2 (Sept. 09)	Lab session 1: DC Circuits	DC Circuits
Week 3 (Sept. 16)	Lab session 2: DC Circuits	Research skills
Week 4 (Sept. 23)	Lab session 3: DC Circuits	Scientific writing
Week 5 (Sept. 30)	Lab session 4: Diodes & Rectifiers	Diodes
Week 6 (Oct. 07)	Lab session 5: Diodes & Rectifiers	AC Circuits 1st lab report due
Reading week: Oct. 14 – 18		
Week 7 (Oct. 21)	Lab session 6: Diodes & Rectifiers	AC Circuits
Week 8 (Oct. 28)	Lab session 7	Writing workshop
Week 9 (Nov. 04)	Lab session 8	2nd lab report due
Week 10 (Nov. 11)	Lab session 9	Signal Analysis
Week 11 (Nov. 18)	Lab session 10	Amplification Writing assignment due
Week 12 (Nov. 25)	Lab session 11 (optional)	Quiz
Monday, Dec. 02	None	3rd lab report due

Working in the physics laboratory:

- When students sign in, 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 final 10 minutes of the lab session must be used to return the equipment to the state it was found in (or better). Failure to leave equipment in good condition and a workspace in a clean and tidy manner will result in the loss of 1 of the 5 points dedicated to lab participation, i.e., a loss of 1% of the overall course grade.

The instruction manuals for the experiments will be posted to the Quercus course page. Students are expected to plan their experiment before the laboratory session.

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

Students are expected to attend 10 three-hour laboratory sessions and attend lectures.

You must 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 formal lab reports.

Lab report grades:

PERCENTAGE	GRADE	GRADE DEFINITION
85 – 100	A	Exceptional performance with strong evidence of original thinking, good organization, capacity to analyze and synthesize; a superior grasp of the subject matter with sound critical evaluations; evidence of an extensive knowledge base.
80 – 84	A-	
77 – 79	B+	Good performance with evidence showing good grasp of the subject matter, some evidence of critical capacity and analytic ability, and reasonable understanding of the relevant issues under examination; evidence of familiarity with the literature.
73 – 76	B	
70 – 72	B-	
67 – 69	C+	Intellectually adequate performance; an understanding of the subject matter and ability to develop solutions to basic problems in the material.
63 – 66	C	
60 – 62	C-	
57 – 59	D+	Minimally acceptable performance; some evidence of familiarity with the subject matter and some evidence that critical and analytic skills have been developed.
53 – 56	D	
50 – 52	D-	
0 – 49	F	Inadequate performance: there is little evidence of a superficial understanding of the subject matter; there is weakness in critical and analytic skills, with limited use of literature.

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 Rm SW302, Science Wing) 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.