

PHYA22H3 Syllabus – Winter 2022

Physics II for the Life Sciences

Instructor: Prof. Dan Weaver
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Office Hours: Wed. 11 AM – 12 PM; Fri. 11 AM – 12 PM;
& by appointment

Required text

Physics for Scientists and Engineers: A Strategic Approach, 5th Edition by Randall D. Knight.

Note: the 4th edition is sufficient.

General course description

The course covers the main concepts of Electricity and Magnetism, Optics, and Atomic and Nuclear Physics. It provides basic knowledge of these topics with particular emphasis on its applications in the life sciences.

Prerequisite: [PHYA10H3 or PHYA11H3 or (PHYA01H3)] and
[MATA29H3 or MATA30H3 or MATA31H3]

Corequisite: (MATA21H3) or MATA35H3 or MATA36H3 or MATA37H3.

Exclusion: PHYA21H3, (PHY110Y), PHY132H, PHY135Y, (PHY138Y), PHY152H

Note: Pre-requisites and co-requisites are enforced.
Students will be removed from the course automatically if they do not have them.

Course organization

Asynchronous online lectures & 3 hour synchronous practical every week.

Due to the ongoing COVID pandemic, practicals will be delivered online during January.

It is expected that practicals will be delivered in person after January 31.

Updates about course delivery will be posted as the pandemic situation evolves.

Course Evaluation

The breakdown of the course grade will be as follows:

Course policy quiz:	1%
Practical Activities (3):	9%
Practical Labs (2):	8%
Video assignment:	4%
Problem sets:	10%
Test 1:	16%
Test 2:	16%
Final Exam:	36%

If pandemic conditions do not permit practicals to return to in person delivery, the labs will not be offered. In this case, the 8% weight associated with the labs will be distributed between the practical activities (change from 3% to 4% each), video assignment (change from 4% to 7%), and final exam (change from 36% to 38%). This distribution of grades will be as follows:

The breakdown of the course grade will be as follows, iff practicals remain online and labs are cancelled due to the pandemic:

Course policy quiz:	1%
Practical Activities (3):	12%
Video assignment:	7%
Problem sets:	10%
Test 1:	16%
Test 2:	16%
Final Exam:	38%

Notes about evaluation:

“I forgot” is not a legitimate reason to request an extension for any work for this course.

Requests for re-grading of any coursework must be submitted to the instructor and/or TA within one week of being returned.

Note: the instructor has caught students for academic integrity violations every year. Don't do it. The consequences can be significant. If you are struggling, please make use of the course supports available and UTSC student advising services.

Lectures

There will be lectures each week. Videos, lecture slides, and notes will be posted to Quercus.

Tentative lecture schedule:

Textbook content should be read before the lecture. This schedule may change during the term.

Week & dates	Topic	Textbook section(s)
Week 1	Course intro & electric charge	Chapter 22
Week 2	Electric Fields	Chapter 23
Week 3	Electric Potential	Chapter 25 & 26
Week 4	Electric Current	Chapter 27
Week 5	Electric Circuits	Chapter 28
Week 6	Magnetism	Chapter 29
Reading Week		
Week 7	Wave Optics & Ray Optics	Chapter 33 & 34
Week 8	Ray Optics & Lenses	Chapter 34
Week 9	Optical Instruments	Chapter 35
Week 10	Atomic Physics	Chapter 37 & 38
Week 11	Atomic Physics	Chapter 41 sections 1, 6 & 7
Week 12	Nuclear physics	Chapter 42

Questions & Email Policies

Use the discussion board on Quercus to ask questions about the course. Often, you will not be the only student with this question – it may already have a discussion and answer posted. Other students may respond to new posts/questions on the discussion board quicker than TAs or I will. By posting questions there, you will help other students with the same question.

If there are questions that are not appropriate for this forum, send email to me using your official utoronto.ca email address – other addresses are filtered out automatically.

You must include the course code (PHYA22) in the email subject and provide your full name and student number in your message. Otherwise, a reply to your message may be delayed significantly. Your student number is necessary to uniquely identify you in any records/database.

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

Course Components

Practicals (17%)

Practical sessions are held every week, starting in week two. Initially, they will take place online using Zoom. It is expected that in person delivery will resume on January 31. Updates to the delivery mode will be announced as the pandemic situation evolves.

Practical sessions will involve a mix of problem solving and activities. You must attend your assigned practical session throughout the term.

Students are required to enroll in a practical section. Failure to do so forfeits the grade associated with practicals (i.e., anything graded by the TA).

TAs will be a valuable source of guidance and help – students' success in the course will greatly benefit from regular practical attendance.

Safety

If in person delivery of practicals resumes, strict safety policies will be implemented. This will include a requirement to wear medical masks at all times. Failure to abide by the mask policy, for any reason or length of time, will result in immediate dismissal from the practical session. In such cases, no opportunity to make up for lost time or grades will be offered. Escalation of consequences will occur as needed.

There will be a zero tolerance for safety and mask policy violations.
These policies exist to protect the safety of the learning environment for students and staff.

Practical activities and labs

There will be three activities. These will be worth 3% each for a total of 9%.

If practicals return to in person delivery in time, i.e., before March, **there will be two labs.** These will be worth 4% each, for a total of 8%.

Submitted work should include your student name and number, course code, and PRA section.

Labs and activities will be done and submitted by each student individually. This work should be submitted using the Quercus Assignments.

The penalty for late practical work will be 15% per day.

Note: TAs offer assistance during practical hours and will have office hours booked before tests and the exam. Help about content from TAs is not generally available over email. Please only email your TA for administrative issues or quick clarifications.

Problem Sets (10%)

This course uses Mastering Physics (MP). This online component of the textbook can be accessed through the course Quercus page. You can purchase access to MP alone or in a package with the textbook. MP will involve ten problem sets, worth 1% each. These problem sets are designed to take approximately one hour each.

You do not need a “Course ID”: access MP through Quercus directly.

MasteringPhysics is best viewed using Chrome web browser. Safari does not work.

Please contact Pearson directly about technical issues. If they are unable to resolve the issue, please let me know at that point.

Note: grades are regularly synchronized between Mastering Physics and Quercus. However, this does *not* happen in real-time. It may take a day or two past the deadline to see updates.

Quiz (1%)

There will be an online quiz covering course policy and syllabus content.

Video Problem Solving Assignment (4%)

You will create a video in which you guide the viewer through the solution to a physics problem you create. There are three components: the question, the video, and a copy of your written solution. The video should be about five minutes long. Videos longer than 10 minutes will not be accepted.

This assignment does not require you to do any sophisticated video production. The goal is for you to demonstrate problem solving skills and an understanding of a specific physics topic. You can create a simple video using a smartphone, pen, and paper.

The video must show the calculation and detailed explanation of how the problem is solved. A TA will evaluate it; however, you should design the content with other students as the audience.

Additional details are in a document posted to Quercus.

Tests (16% each)

Two term tests will be scheduled by the university during the term. They will cover content from the lectures, practicals, and assigned sections of the textbook. Both tests are cumulative and will consist of multiple choice and calculation questions.

Collaboration between students is a serious academic integrity offense.

Use of unauthorized aids is a serious academic integrity offense.

Exam (36%)

The exam will be scheduled during the exam period: **April 13 – 29**. It will be 3 hours long. The format will include multiple choice and calculation questions. The exam will cover the lectures, practicals, and assigned sections of the textbook. The exam is cumulative – it will cover content from the entire course.

Tests & Exam Delivery Note

The term tests and exam are planned to be delivered in person. If pandemic conditions do not permit in person tests, they will be conducted online using Quercus Quizzes. Any change from the in person plan will be announced by the instructor through Quercus Announcements.

Absences

There are no make-up options for practicals, formal reports, or the tests. In the event of legitimate medical absences, please see the following page with details about the medical/illness policy, procedure, and form:

<https://www.utoronto.ca/physsci/self-declaration-absence-form-0>

If it affects the submission of practical work, please notify your TA.

In the case of an appropriately documented absence from the first test, the weight of that test will be added to the second test. In the case of a documented absence from the second test, the weight will be transferred to the final exam.

Resources

In addition to the instructor, TA, and textbook, the following resources are available:

Facilitated Study Group (FSG)

FSGs are organized by the Centre for Teaching and Learning.

Information can be found here: <https://www.utsc.utoronto.ca/ctl/facilitated-study-groups-fsg>

“Facilitated Study Groups are weekly collaborative learning sessions for students who want to improve their understanding of challenging content in selected courses at UTSC.”

Physics Study Centre (PSC)

The PSC offers free tutoring for first-year physics students.

Information and tutoring schedule: <https://www.myepsa.ca/tutoring/physics-centre/>

Writing Centre

The Writing Centre is a resource for all UTSC students. They offer support for any stage in the writing process and for all fields of study. You can make appointments or drop-in during designated hours for writing help.

Writing skills *are* important for science students! Formal lab reports will be a significant part of your science degree. There are high expectations for writing quality.

Website: <https://utsc.utoronto.ca/twc/>

UTSC Library

The library is a valuable resource, e.g., to consult physics books beyond your textbook, clarify how to properly cite references, or find reference material to improve the introduction to your formal lab report.

Website: <https://utsc.library.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 documentation, including (but not limited to) doctor's notes.

Academic integrity rules are monitored and strictly enforced.

Code of Student Conduct

Students are required to conduct themselves in a considerate, respectful, and professional manner. These expectations are outlined by the Code of Student Conduct:

<https://www.uts.utoronto.ca/vpdean/code-student-conduct>

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.

Course materials are the intellectual property of the instructor. Sharing or posting them online is prohibited.

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.uts@utoronto.ca. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.