PHYA11H3 Syllabus – Fall 2020

Physics I for the Life Sciences

Instructor: Dan Weaver
Email: dan.weaver@utoronto.ca
Office: SW 506F
Office Hours: To be announced & by appointment

Required text: Physics for Scientists and Engineers, 4th Edition by Knight

General course calendar description

The course covers the main concepts of classical physics and its applications to macroscopic systems. The main themes are kinematics, dynamics, oscillations, and waves. It provides basic knowledge of these topics with emphasis on its applications in the life sciences.

Prerequisites:
Grade 12 Advanced Functions (MHF4U) and Grade 12 Calculus and Vectors (MCV4U)

Corequisite:
MATA29H3 or MATA30H3 or MATA31H3

Exclusions:
PHYA10H3, PHY131H, PHY135Y, PHY151H

Please note: pre-requisites and co-requisites are enforced. You will be removed from the course automatically if you do not have them.

Course organization
3 hours of lecture & 2 hours of practical every week.

Course Evaluation

Practicals: 24%
Problem sets (Mastering Physics): 9%
Test 1: 16%
Test 2: 16%
Final Exam: 35%

“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.
Lectures

There will be two lectures each week:

Wednesdays 3 PM – 5 PM & Fridays 2 PM – 3 PM on Blackboard Collaborate (in Quercus).

Lectures will be recorded and posted. Lecture slide files and other resources will also be posted to Quercus as well.

Out of respect for other students in the class, please avoid distracting others, e.g., ensure your mic is muted unless you need to speak with me. Students making a noticeable amount of noise will be told to leave at my discretion.

Tentative lecture schedule:

This schedule may change during the term.

<table>
<thead>
<tr>
<th>Week &amp; dates</th>
<th>Topic</th>
<th>Textbook chapter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Course Intro &amp; 1D Kinematics</td>
<td>Chapter 1 &amp; 2</td>
</tr>
<tr>
<td>Week 2</td>
<td>Kinematics in 2D</td>
<td>Chapter 3 &amp; 4</td>
</tr>
<tr>
<td>Week 3</td>
<td>Forces &amp; Dynamics I</td>
<td>Chapter 5 &amp; 6</td>
</tr>
<tr>
<td>Week 4</td>
<td>Forces &amp; Dynamics II</td>
<td>Chapter 7 &amp; 8</td>
</tr>
<tr>
<td>Week 5</td>
<td>Energy &amp; Work</td>
<td>Chapter 9 &amp; 10</td>
</tr>
<tr>
<td></td>
<td>Reading Week</td>
<td></td>
</tr>
<tr>
<td>Week 6</td>
<td>Term test 1 &amp; Energy</td>
<td>Chapter 11</td>
</tr>
<tr>
<td>Week 7</td>
<td>Momentum</td>
<td>Chapter 12</td>
</tr>
<tr>
<td>Week 8</td>
<td>Rotation</td>
<td>Chapter 15</td>
</tr>
<tr>
<td>Week 9</td>
<td>Oscillations</td>
<td>Chapter 16</td>
</tr>
<tr>
<td>Week 10</td>
<td>Waves</td>
<td>Chapter 16</td>
</tr>
<tr>
<td>Week 11</td>
<td>Waves</td>
<td>Chapter 16</td>
</tr>
<tr>
<td>Week 12</td>
<td>Superposition of waves</td>
<td>Chapter 17</td>
</tr>
</tbody>
</table>

Questions & Email Policy

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 PHYA11 in the email subject and provide your full name and student number in your message.

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

Practicals (24%)

Practical sessions are held every week, starting in week two, online using Blackboard Collaborate. These weekly practical sessions will involve a mix of problem solving and activities. You must attend your assigned practical session throughout the term. Your TA will be a valuable source of guidance and help – your success in the course will greatly benefit from regular practical attendance.

There will be six lab reports. They will be worth 3% of your grade each.

There will also be four activities. These will be worth 1.5% each.

Lab reports and activities will be done and submitted by each student individually. This work should be emailed directly to your TA before the deadline.

Details will be discussed and posted to Quercus. This will include details about report expectations, documents and data for each lab, and deadlines for report submissions.

You are welcome to submit work before the deadlines, e.g., if you are unable to attend a practical session when something is due.

The penalty for late practical work (i.e., lab reports) will be 15% per day. Work is due at the start of the practical session. Work submitted more than 15 minutes past the start of the practical session is considered late.

Problem Sets (9%)

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 nine assignments, worth 1% each. It also offers additional support material to help your understanding of the material. Graded items are titled “Assignment ...”.

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.
Term tests (16% each)

Two term tests will be scheduled 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.

The tests will be online using Quercus Quizzes.

Collaboration between students is a serious academic integrity offense.

Exam (35%)

The exam will be scheduled during the exam period: December 10 – 22. 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.

The exam will be online.

Collaboration between students is a serious academic integrity offense.

Extra Credit Assignment (+3%)

You will create a video in which you guide the viewer through the solution to a physics problem you create. The video should be about five minutes long.

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 and/or instructor will view the video to evaluate it, but you should design the content with other students as the audience.

Submissions must be made directly to your TA using email. There are three components: the question, the video, and a copy of your written solution.

More details will be provided by a document posted to Quercus.

Absences

There are no make-up options for practicals, formal reports, or the tests. In the event of legitimate medical absences, please provide official documentation from UTSC Health Services or a medical professional to the instructor. This form can be accessed here. If it affects the practical work, please provide this documentation to your TA.

If you have a legitimate medical absence from a practical, an accommodation will be provided. 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.
Use and distribution of course materials

Course materials prepared by the instructor are considered by the University to be an instructor’s intellectual property covered by the Copyright Act, RSC 1985, c C-42. These materials are made available to you for your own study purposes and cannot be shared outside of the class or “published” in any way. Lectures, whether in person or online, cannot be recorded without the instructor’s permission.

Posting course materials or any recordings you may make to other websites without the express permission of the instructor will constitute copyright infringement.

Resources

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

Facilitated Study Group

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 (FSGs) are weekly collaborative learning sessions for students who want to improve their understanding of challenging content in selected courses at UTSC.”

Physics Study Centre

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.

Writing skills *are* important for science students! Formal lab reports will be a significant part of your science degree and career. There are high expectations for writing quality. I encourage you to make use of this resource.

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.

Website: https://utsc.library.utoronto.ca
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 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.