

# PHY131H1F “Introduction to Physics I”

## Syllabus: Fall 2017

[Most recent update: August 31, 2017]

Welcome! The purpose of this course is to give you an introduction to how physicists think, and how they approach problems. Physics is one of the oldest sciences, and in some ways it is the most simple. Physicists start with a big, messy problem and they first simplify it as much as they possibly can. Only then do they try to analyze the situation. They then gradually introduce more complications, one at a time, until they eventually end up with a very complicated, and hopefully useful, model.

By the end of this course you will be able to use basic concepts from physics to explain and predict simple situations. You will also be able to incorporate several concepts in order to explain and predict what will happen to messy problems which approximate real life situations. Finally, you will be able to describe basic concepts from physics and explain how and when they are useful. The main concepts we cover in PHY131 are Newtonian mechanics, uncertainty analysis, oscillations and waves.

### Contacts

**Professor (first half of semester) and Course Coordinator:** Brian Wilson

**Office:** MP129D

**Office Hours:** Monday 2-3, Tuesday 2-3 and Wednesday 3-4

**Professor (second half of semester):** Jason Harlow

**Office:** MP328

**Office Hours:** Monday 2-3, Tuesday 2-3 and Wednesday 3-4

**Course Administrator:** April Seeley

**Office:** MP129

**Office Hours:** M-F 8:30-1:00 and 2:30-3:50

**Voice Landline:** 416-946-0531

**Practicals Coordinator:** Carolyn Sealfon

**Head Teaching Assistant:** Catherine Woodford

**Web Site:** <https://portal.utoronto.ca/> **Email:** [phy131@physics.utoronto.ca](mailto:phy131@physics.utoronto.ca)

### Meeting Times

Lectures are on Mondays and Wednesdays either from 11:10am to 12:00pm in Convocation Hall (L0101), or 5:10 to 6:00pm in MP103 (L0501). Practical meetings are for two hours once per week in MP122, MP123 or MP124. The exact locations and times for these practicals are posted on the course web-site under “Practicals” and “My PRA Group”. NOTE: You must register for *both* the lecture *and* the practical parts of this course.

### Required Text

“**Essential University Physics**” Volume 1 (3rd Edition) by Richard Wolfson, ©2016 by Pearson Education, Inc. Note that PHY132, starting in January, requires Volume 2 of this same text, so you should probably purchase both volumes. When bought new from the University of Toronto Bookstore or Discount Textbooks, this book comes with a free access code for MasteringPhysics and LearningCatalytics. If you wish to buy MasteringPhysics and LearningCatalytics separately, it costs \$50.

## Also Required

- A non-communicating **calculator**, with no infrared or wireless communication capability. Programmable graphing calculators are allowed, but not necessary. At the minimum it should have SIN, COS, TAN on it and be able to do scientific notation.

## Marking Scheme

Scheme 1:

Final Exam	45%
Two Midterm Tests	30%
Practicals	15%
Online MasteringPhysics Problem Sets [weekly]	2%
Online MasteringPhysics Pre-class Quizzes [every lecture]	2%
Lecture Participation (LearningCatalytics) (4% participation + 1% for accuracy)	5%
Pre/post-course Diagnostic Quizzes	1%
Bonus for Over 65% Course Evaluation Response Rate	1%

Scheme 2:

Final Exam	50%
Two Midterm Tests	35%
Practicals	15%
Online MasteringPhysics Problem Sets [weekly]	0%
Online MasteringPhysics Pre-class Quizzes [every lecture]	0%
Lecture Participation (LearningCatalytics)	0%
Pre/post-course Diagnostic Quizzes	0%
Bonus for Over 65% Course Evaluation Response Rate	1%

At the end of the semester, your mark will be computed using both schemes, and the mark you receive will be the **higher** of the two. Note that the maximum possible mark is 101% above, but in the end every student will be held to a maximum of 100%.

## Important Dates

Date	What?
Sep. 11 – Oct. 4	Classes every Monday and Wednesday
Mon Oct. 9	Thanksgiving – no class today
<b>Tue Oct. 10, 6:00-7:30pm</b>	<b>Evening Midterm outside class time</b>
Oct. 11 – Nov. 1	Classes every Monday and Wednesday
<b>Nov. 6-10</b>	Reading Week – No classes
Nov. 13 – Dec. 4	Classes every Monday and Wednesday
<b>Tue Nov. 14, 6:00-7:30pm</b>	<b>Evening Midterm outside class time</b>
Thu. Dec. 7	Last class (at 11am in Con Hall and 5pm in MP102)

## Practicals

In addition to classes, you will be meeting in Practicals for 2 hours once a week in room MP122, MP123, or MP124. You will be working in an assigned team with up to three of your classmates. There will be two Teaching Assistant Instructors present for each Practical. The student-to-teacher ratio is, at most, 18:1. You do not need any special equipment or clothing for Practicals, just a calculator, something to write with, and enthusiasm!

Please try to select your PRA section on ACORN no later than September 20. After that date you must fill out a Practical Section Registration Online Form, available on the course web-site on portal. Only conflicts with other courses can normally be accepted as valid reason to change a Practical section after September.20.

A list posted on the first day near the door of MP122 will tell you which pod you have been assigned to. Your TAs will provide you with a seating assignment. Your Team of 3 or 4 students will keep a single lab notebook (provided by us), which is to be a complete record of everything you did, what you and your teammates thought it meant, and what conclusions you have drawn from your work. This notebook never leaves the room; all Practicals work must be completed within the weekly 2-hour Practical session. Each Practical session will include time for student questions and discussion.

For each Practical session two members of each Team will serve the following roles: (1) Facilitator: This person, a different individual each week, is responsible for keeping the Team on track with the Activities. When the entire Practical group discusses some topic, the Facilitator will be the Team's primary spokesperson. (2) Recorder: This person, also a different individual each week, takes primary responsibility for recording all work, speculations, conclusions, etc. in the lab notebook.

Attendance in Practicals is mandatory for all students in PHY131. Any student late or absent for practicals will lose marks unless a valid, documented excuse is provided. If you must miss a Practical session for a valid reason, such as illness, please obtain documentation (such as a Verification of Student Illness or Injury form) and provide it to April Seeley in MP129. There are no make-up Practicals sessions, but your mark will be adjusted so that excused absences will not count against your Practicals mark. It is your responsibility to check with your TA about material missed during the Practicals that you need to study for the tests and exam.

## MasteringPhysics and LearningCatalytics

To register for MasteringPhysics and LearningCatalytics you need an access code, which comes for free when you purchase a new "Essential University Physics" Volume 1 (3rd Edition) by Richard Wolfson textbook at the U of T

Bookstore or Discount Textbooks. Stand-alone accounts on MasteringPhysics and LearningCatalytics are also available for \$50 at the bookstore for students who have obtained used textbooks. Follow the instructions on the Course Web Site for getting started on MasteringPhysics and LearningCatalytics.

### **Pre-class Quizzes**

Classes in this course involve a lot of discussion and reflection, and they are much more effective if every student already has some familiarity with the chapters we will be discussing. In order to encourage reading ahead, before each class, beginning with class 2, you will have to complete a short online quiz based on the reading for that day. There will also be an essay question for which you can type additional questions, thoughts or comments which we will read before class. The quiz is due by 8:00am before each class, so we actually suggest completing it the evening before the class. Each quiz contains only 5 questions or fewer, all of which should be quite easy if you have done the reading and/or watched the pre-class video on YouTube. There are 23 pre-class reading quizzes in the course, and your mark will be determined based on the best 20 of these. Pre-class quizzes which arrive late will receive a mark of zero.

### **Problem Sets**

Problem Sets will be assigned weekly throughout the semester on MasteringPhysics, starting with the first problem set which is due September 24 by 11:59pm. Students are encouraged to use all resources when thinking about the problems and formulating answers. Final answers to problem sets should be prepared and submitted by students individually. The late penalty for problem sets is 10% per day of lateness reduction in mark.

### **Lecture Participation**

LearningCatalytics is an interactive student response tool that uses students' smartphones, tablets, or laptops during class. We use LearningCatalytics to involve students in the class, survey the class, figure out what the majority of the class knows, and promote discussion.

For each lecture beginning with class 2, questions will be posted through Learning Catalytics during the class. Most questions will be graded 80% participation and 20% correctness, though some questions will be graded 100% participation. Your grade will be your total score divided by 80% of the maximum score, with a maximum possible value of 100%. Example: if there are 100 marks available, and you got 81, your score is  $81/80$  which becomes 100%. If you got 75 marks, your grade would be  $75/80$  which is 94%.

## **Pre/post-course Diagnostic Quizzes**

Your first Practical session, scheduled in the first week of the semester, will be devoted to a Pre-course Diagnostic Quiz. This quiz should help us make our instruction more effective. A second, similar quiz will be given during the final Practical session to assess what you have learned over the semester. As an incentive for you to take these quizzes, we are making them worth 1% of your course mark. To earn this mark, all you have to do is to answer all questions on the quizzes, regardless of the correctness of your answers. We only ask that you avoid guessing; your answers should reflect what you personally think.

## **Bonus Point for Over 65% Course Evaluation Response Rate**

The University of Toronto is committed to ensuring the quality of its academic programs, its teaching, and the learning experiences of its students. An essential component of our commitment to teaching excellence is the regular evaluation of courses by students. For a two week period at the end of the semester you will be allowed to follow a link that is sent to you by U of T and evaluate PHY131H1F. It will only take 10 or 15 minutes to answer the questions and enter your typed thoughts about the course. Your answers and thoughts are anonymous, but are very important to us. We promise you that when the results become available to us in January, we will read every comment and scrutinize the responses to see if it can help us improve the course or our teaching in the future.

The evaluation period for this semester will be: **Mon. November 27 – Thu. December 7, 2017**. During the evaluation period, we will monitor the response rate and advertise it during lectures. If, by the end of the course evaluation period, at least 65% of the students enrolled in this course complete the course evaluations, then every student in the course will have 1% added to their final course mark. If fewer than 65% of students complete the course evaluations, then no bonus point will be added for any student.

## Midterm Tests and Final Exam

On Tuesday October 10 and Tuesday November 14, **Midterm Tests** (each 80 minutes long) will be held in the evening, from 6:10-7:30pm in rooms TBA. If you have a course-conflict you will be permitted to register to write the alternate sitting, which is the same day from 4:40-6:00pm. There is no third sitting, and no make-up test. If you have concerns about your test mark, please bring them promptly to the attention of April Seeley ([phy131@physics.utoronto.ca](mailto:phy131@physics.utoronto.ca)).

In the event that you miss a midterm test for medical reasons, you must have the reasons documented by an approved medical practitioner on the official U of T Verification of Student Illness or Injury Form (<http://www.illnessverification.utoronto.ca/>). If you do not, you will be assigned a grade of zero for the test. If you miss a test for valid and documented emergency such as illness, the weight of the test will be transferred to the other test, which will then count for 30% of your course mark.

A 2-hour **final examination**, administered by the Faculty of Arts & Science, will be held during the December examination period at a time announced by the Faculty and announced by late October. Detailed instructions will be posted on our Portal website a few weeks before the exam. If you miss the final exam, or if you have concerns about its marking, you must go to the Office of the Registrar of the Faculty of Arts & Science and follow their instructions.

During the term tests and final exam, you may bring one handwritten (not typed), original (not photocopied) 8½ × 11 sheet, on both sides of which you can write anything you wish. Only non-communicating calculators, with no infrared or wireless communication capability, can be used at midterm tests and at the final exam.

You will be writing the midterm tests and final exam in a room assigned based on your family name. Room information will be posted on the portal web-site. If you show up at a room to which you have not been assigned, you may be turned away by the invigilators who will be checking people's names when they collect signatures; in any case, you may be held in breach of the Code of Student Conduct and risk a penalty.

Out of consideration for your fellow students, before you come in to lectures, tests or the exam, please remember to disable any device that can beep (watches!) or otherwise emit electronic sounds (cell phones!). While sitting at your seat during the test or exam, you will not be allowed to have on you any kind of phone, smartwatch, smartglasses, or any communication device whatsoever. These must be switched off completely and left in your bag.

At the end of a test or exam, please stop writing immediately when asked to do so by the invigilators, and remain seated until all papers have been collected. Filling circles on your answer sheet is no longer allowed from that moment. Continuing to write after the end of a test or exam is a serious, sanctionable offence.

## Academic Integrity

Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves. Familiarize yourself with the University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>). It is the rule book for academic

behaviour at the U of T, and you are expected to know the rules.

**Practicals:** The work submitted for marks during Practical exams must be completed during Practical exams with the other members of your pod. Materials completed before Practical exams may not be brought in and used to speed up the work in Practical exams. Each pod-member should try to contribute, and encourage others to contribute to the work that ends up being submitted. All members of the same pod who are in attendance share the mark of the single submitted product. One of the purposes of Practical exams is to teach you how to form effective teams, and work efficiently within a team of three or four peers.

**MasteringPhysics and LearningCatalytics:** The point of the online homework, pre-class and in-class questions is to prepare you for the tests and exam. When you are unsure and find you cannot progress with something on your own, it makes sense to seek out a friend in the class to see if they have any helpful hints. But the work you submit in the end should be *your own* work, and you should understand everything you submit and be prepared to explain why you submitted it.

**Tests and Exam:** Midterm tests and the final exam must be done individually, involving no communication at all with your peers. It is strongly advised not to engage in any behaviour that might be construed by the invigilators for the tests/exam as an attempt to obtain information from another candidate or from another test/exam paper.

The University of Toronto treats cases of academic misconduct very seriously. All suspected cases of academic dishonesty will be investigated following the procedures outlined in the Code. The consequences for academic misconduct can be severe, including a failure in the course and a notation on your transcript. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me. If you are experiencing personal challenges that are having an impact on your academic work, please speak to me or seek the advice of your college registrar.

## **Accessibility**

We are committed to ensuring that every student has a fair chance to do well in this course. If you recognize any barriers to your ability to excel please let us know as soon as possible so that we can work together to minimize their impact.