

## **PHYA11H Fall 2018**

### *Introduction to Physics I (Physics I for the Life Sciences)*

**INSTRUCTOR: Mr. Gyula Lorincz**

I

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#### **COURSE DESCRIPTION:**

This first course in Physics at the university level is intended for students enrolled in the Life Sciences. It covers fundamental concepts of classical physics and its applications to macroscopic systems in one and three dimensions. It deals with a few main themes; which are Particle and Fluid Mechanics, and Oscillations. The approach will be phenomenological with applications related to life and biological sciences.

The purpose of this course is to give you an introduction to how scientists 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 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.

#### **COREQUISITE:**

MATA29 is a corequisite for PHYA11. If you registered in or have not passed MATA29 your registration in PHYA11 will be cancelled.

#### **LECTURES:**

Lectures will be videotaped. Recordings should be available until after the final exam. However, I encourage in-class participation (using Clickers, see below).

Please respect others, including the professor, in the classroom. Turn your cell phones to silent mode. Do not play 'Angry Birds' or watch TV shows unless you're in the back row where you will not distract others.

Lectures will be structured assuming that you have read the textbook before coming to lecture.

### **LECTURE NOTES:**

Lecture notes (i.e., slides) will be posted on Quercus. I will do my best to get them posted by the night before each lecture.

### **COURSE MATERIAL:**

*Physics for Scientists and Engineers (4th edition)* by Knight. Copies are available at the UTSC bookstore. There are a variety of formats (including an e-book). As we will not be using Mastering Physics in PHYA11, you do not need to get a package which includes it. If you get the third edition that should suffice, though page numbers and back of the chapter questions may differ. I will be posting numbers based on the fourth edition.

You do NOT need to purchase a lab manual for this course.

### **OFFICE HOURS:**

TBD. If you cannot make them it will be possible to schedule *office* hours at *different* times. Please setup an appointment via e-mail, and expect it to take a few days (so don't wait until the day before a test to try to visit).

### **E-MAIL:**

Medical and other personal issues should be done via e-mail. If I do not reply within 48 hours, you should send me a reminder e-mail as my inbox can get rather full.

### **ASSESSMENT:**

FINAL EXAM:	40%
TERM TEST 1:	15%
TERM TEST 2:	15%
PRACTICAL QUIZZES:	8% in total
PRACTICAL GROUP WORK:	11% in total
FORMAL LAB REPORTS:	5% and 6%, 11% in total

### **TESTS AND EXAM:**

Both the term tests and final exam will draw from the lectures, practicals and textbook. This could include material presented in the lectures or tutorial material that is not covered in the textbook. It could also include assigned reading material that was covered in the textbook but not explicitly discussed in lectures.

All tests and exams are cumulative.

There will be no make-up tests. If you miss the first test for an excusable reason (usually medical) that grade will be added to second term test mark. So if you miss the second term test, that grade will be added to the exam mark. Students who miss both term tests need to speak with me about their final exam.

### **READING:**

There will be no weekly reading quizzes in PHYA11. You are still expected to keep up with your readings.

### **PRACTICAL QUIZZES AND MASTERING PHYSICS:**

There is no graded homework for this course. Instead, about every other week a list of suggested problems from the textbook will be given. I will try to assign the same problems on Mastering Physics. (Note that you are not required to purchase Mastering Physics; however it is a useful learning tool that can give you a lot of feedback as you work on the problems.) These problems are meant to help you master the physical concepts of the course and problem-solving techniques. You are strongly advised to work on the problems seriously and independently, since that is the only way to learn. During several practical sessions there will be a quiz. This quiz will be based on the suggested problems. These quizzes should be easy if you do all of the suggested problems.

Please note that these questions will be basic problems that you should master before the tests and exam. Questions on the tests and exam will likely be more *difficult* than these quiz questions. Think of them as the first few rungs on a ladder, with the exam being the top of the ladder.

### **PRACTICALS:**

There will be eleven (11) weeks of Practicals. Two of those weeks will be Lab based and will require you to produce a formal lab report. The first Lab's formal report will be worth 6% of your final grade. The final Lab's formal report will be worth 7% of your final grade. Please make sure you submit original work! If you are caught plagiarizing, you will be sent to the Dean's *office*.

All Practical work, including the labs, will be done in groups. Lab reports will be submitted one per group. *STYLE* is important! If you submit a Frankenpaper (three sections written in three very *different* ways and then crudely stitched together) your grade will *suffer*. So make sure you get together early and have it well written! I recommend nominating one person to be the editor and have them do a little less writing and a lot more editing so that the final report looks good.

The non-Lab Practicals will include problem-solving in groups. One member of your team will be required to record your work. Each week, two of the activities you do will be graded. During the lab Practicals, the notes you take will count as activities and will be similarly graded with similar weights to the other Practical sessions. Thus every week's Practical will generate grades. These marks will sum up to your 11% grade for Practical work.

Finally, since the Practicals are team-based, it is important that you show up every week. To encourage this, a penalty to your Practical Group Work will be applied. So you stand to lose up to 11% of your final grade for absences from Practicals. This penalty will be the *SQUARE* of the number of absences, as a percent. If you miss 4 Practicals, your grade will *suffer* by 16%. This is in addition to not getting credit for the group work which you were absent for.

If you are more than 10 minutes late (arrive at 9:20, say, instead of 9:10) you will be counted as absent, but will still get credit for the group work. Similarly, if you leave early you will also be counted as absent.

### **CONCERNS?**

If you have any concerns about the course and your ability to do well, please come see me and we can discuss your situation. I am happy to make reasonable accommodations to ensure that all students have an equal opportunity to do well in this course. You can also speak with the people at *ACCESSAbility* Services who can advise us both.

### **Tentative Schedule:**

#### **– Mechanics:**

Ch 1-4	Kinematics	2 weeks
Ch 5-8	Dynamics	3 weeks
Ch 9-11	Conservation Laws	2.5 weeks

#### **– Applications:**

Ch 12	Rotation	2.5 weeks
Ch 15	Oscillations	2 weeks