Introduction to Physics IB
(Physics for Life Sciences)

PHY A11 - LEC 01 - Fall 2010

Wednesday	3:00 pm - 5:00 pm	AA112	Arts & Administration Building
Friday	2:00 pm - 3:00 pm	AA112	Arts & Administration Building

Instructor: Brian Wilson
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Tutorials: Thursday
Hours: 3:00 pm - 5:00 pm; 5:00 pm - 7:00 pm
Tutorials: Friday
Hours: 9:00 am - 11:00 am; 11:00 am - 1:00 pm
Tutorial Leaders: Check Course Website

Lab Practicals: Tuesday, Thursday
Hours: 9:00 am - 12:00 pm; 1:00 pm - 4:00 pm
Lab Demonstrators: Check Course Website

Course Website: portal.utoronto.ca
Office Hours: Wednesday 1:30 pm - 2:30pm; Friday 12:30 pm - 1:30 pm

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 two main themes; which are Particle and Fluid Mechanics, and Waves and Oscillations. The approach will be phenomenological with applications related to life and biological sciences.

Using examples and problems derived from the study of Life Sciences, in this course we will explore the fundamental concepts, theories, and techniques used in the describing the mechanics of particles and fluids, and the related phenomena of oscillations and waves.

By the end of the course you will be able to:

- Identify and define the basic Physics vocabulary used to describe different types of motion and its causes.
- Interpret and give examples of the laws of Nature governing the field of mechanics, as well as the various derived conservation principles.
- Develop a set of problem-solving skills related to the analysis of physical situations, as described by: an experiment and subsequent data analysis, a conceptual or phenomenological question, and a detailed problem involving multiple concepts.
- Recognize the existence of a basic paradigm for the study of Physics, and translate this paradign into learning skills and tools useful in other areas.

Course Prerequisite: Grade 12 Advanced Functions (MHF4U)
Course Corequisite: Calculus A (MATA20) or Calculus I (MATA30)
Recommended Preparation: Grade 12 Physics (SPH4U)

Required Materials

Textbook

Physics for the Life Sciences by Zinke-Allmang
ISBN# 0176442596
Published by Nelson Education Ltd.
U of T Bookstore SKU# 0176449469

The schedule provided at the end of this document indicates the chapters you must read **before** each lecture. Not only in-class participation quizzes will be based on this pre-lecture reading, but your conceptual understanding of the various topics will be enhanced by it.

The textbook also provides the conceptual questions and detailed problems that will be the subject of the weekly online homework and bi-weekly tutorial activities.

Please note that you will need the access card provided with the textbook since the weekly online homework will require you to enter the access number found in the package.

Automated Student Response System

i>clicker by Macmillan
U of T Bookstore SKU# 9780716779391

You will need a clicker to be able to answer the in-class participation quizzes. In order to receive the participation mark you must register your clicker at:

http://www.iclicker.com/registration/

You must do this by **Sunday, September 19th**, as on that date the registration information will be synchronized with the course roster. Enter your first name and last name as they appear on your student card. In the field listed as **Student ID**, enter your **UTORid** (not your student number). Enter your **Remote ID** as it appears on the back of your clicker. This should be a code similar to **02984CD6**. The code contains only alphanumerical characters and might contain the number **0** but not the letter **O**.

Calculator

Casio: FX-260 (SKU# 40029297101)
Texas Instruments: TI-30X IIS (SKU# 40005852101)
Sharp: EL-520WB (SKU# 40051100540), EL-531VB (SKU# 40005845101), EL-546VB (SKU# 40005843101)

For this course, you will need a scientific non-programmable calculator. This calculator will also be the only aid allowed for tutorial quizzes, the midterm test and the final examination. In no particular order, the models listed above are recommended choices, available at the U of T Bookstore.

Lab Manual

Course Reader, Fall 2010
PHY A10/11/21/22 - Introduction to Physics IA, IB, IIA & IIB

Lab Workbook

University Physics Notebook, Black Cover

Grading Scheme

Component	Points	Due Date
Lab Practicals	18	Ongoing (PRA Session)
Tutorials	15	Ongoing (TUT Session)
Online Homework	5	Every Thursday
In-Class Participation	7	Ongoing (Lecture Time)
Midterm Test	20	TBA
Final Examination	35	Exam Period

Lab Practicals (PRA Sections)
During these 3 hour bi-weekly sessions we will work developing experimental techniques and skills related to Physics and the Scientific Method. Work will be graded on the basis of:

- Preparation for the experiments assessed at the beginning of each session.
- Notes taken during the session on the experiments being conducted.
- Two formal reports due after completion of the first and third experiments.

More information on the grade breakdown, scheduling and policies can be found on the course website and your Lab Manual.

Tutorials (TUT Sections)
In these 2 hour bi-weekly sessions we will work in the understanding and discussion of examples that illustrate the main concepts introduced in your textbook readings and the lecture presentations. We will also work in the application of these concepts and fundamental principles, in order to develop skills useful in problem-solving in Physics and other sciences. Work will be graded on the basis of:

- Conceptual questions and problem-solving activities to be done in groups during the tutorial session. The results of this group effort will be submitted at the end of each tutorial session.
- An individual quizz at the end of the tutorial session, based on the activities, concepts and problems discussed in the lectures and tutorials up to that point.

Note that attendance to the tutorials is mandatory and you will be penalized with a deduction to your final tutorial grade should you miss a session. This deduction will be a percentage equal to the cube (third power), of the number of absences. More information will be provided during your first organizational tutorial session on **Thursday, September 16th or Friday, September 17th**, and on the course website.

Online Homework
This will be due on **Thursday** each week as an online set of questions based on the previous week's textbook reading material and lecute presentations. This homework will be posted on the course website and you will need the **access code** found in your textbook package. These homeworks will be a mix of conceptual multiple-choice questions and applied problem-solving questions. Each homework is worth **10 points**, with the **best 10** results counting towards your final grade.

In-Class Participation
During each lecture we will work on clicker questions from the textbook readings and the lecture presentation. During each lecture **1 point** can be earned by answering at least **75%** of the questions asked. The total sum of all lecture points makes up your participation grade up to a maximum of **20 points**.

Online Participation
After each lecture, in three sentences you will summarize the main point of the lecture, the most interesting point in the discussions, and the muddiest point in the lecture. You will have until 11:55 pm on the day of the lecture to submit your answer. Each lecture summary is worth 1 point and the total sum of of all points makes up your online participation grade up to a maximum of 20 points.

Midterm Test
The midterm test will be on the week of October 18-23. This test will be based on the concepts and problems presented in the lectures and in your textbook readings up to and including the material of Friday, October 15th. The test will also include the online weekly homework and the tutorial discussions up to and including the session of Friday, October 15th.

The length of the test will be **two hours** and the format includes multiple-choice questions as well as detailed problems. The only aid allowed for the midterm is your non-programmable scientific calculator.

Final Examination
The final examination will be scheduled during the exam period. Material for the final examination will include all the topics covered in the assigned textbook readings, lecture presentations, online homework and tutorial sessions.

The length of the final examination will be **three hours** and the format includes multiple-choice questions as well as detailed problems. The only aid allowed for the midterm is your non-programmable scientific calculator.

Class Schedule

Please note that this schedule is ***tentative*** and might change during the term in order to accomodate variations in the lectures in response to feedback from the students. Announcements will be made whenever needed.

Week & Dates	Wednesday Lecture	Friday Lectures
Sep. 15	Introduction	Kinematics - Ch.2
Sep. 17	Kinematics - Ch.2	
Sep. 22	Forces - Ch.3	Newton's Laws - Ch.3
Sep. 24	Forces - Ch.3	
Sep. 29	Newton's Laws - Ch.3	Applications of Newton - Ch.3
Oct. 01	Newton's Laws - Ch.3	
Oct. 06	Linear Momentum - Ch.4	Friction - Ch.4
Oct. 08	Linear Momentum - Ch.4	
Oct. 13	Rigid Objects - Ch.5	Circular Motion - Ch.21
Oct. 15	Rotational Equilibrium - Ch.5	
Oct. 20	Energy - Ch.6	Work - Ch.6
Oct. 22	Energy - Ch.6	
Oct. 27	Work - Ch.6	Energy Conservation - Ch.6
Oct. 29	Energy Conservation - Ch.6	
Nov. 03	Stationary Fluids Model - Ch.11	Stationary Fluids Properties - Ch.11
Nov. 05	Stationary Fluids Properties - Ch.11	
Nov. 10	Ideal Dynamic Fluid - Ch.12	Newtonian Fluids - Ch.21
Nov. 12	Newtonian Fluids - Ch.12	
Nov. 17	Fluids Applications - Ch.12	Elasticity - Ch.16
Nov. 19	Elasticity - Ch.16	
Nov. 24	Hooke's Law - Ch.16	Oscillations - Ch.16
Nov. 26	Oscillations - Ch.16	
Dec. 01	Waves - Ch.17	Waves Applications - Ch.17
Dec. 03	Sound Waves - Ch.17	