

Course Outline

PHY131H1F – “Introduction to Physics I” Fall 2011, University of Toronto St. George Campus

[Updated version, Oct. 12, 2011. Changes made from the September version are [in dark blue font.](#)]

Welcome! This is the first half of a two semester course designed to introduce physics to science students in fields other than physics. There are no university pre-requisites for this course, but you must be currently taking or have taken university calculus (see the calendar for co-requisite information). The topics of PHY131 include motion in one, two and three dimensions, forces, gravity, Newton’s Laws, momentum, energy, angular momentum, elasticity and fluids. There are two 1-hour classes per week (Monday and Wednesday) plus one 2-hour Practical (a “Practical” combines aspects of a laboratory and a tutorial). Throughout the course we will be developing skills in problem solving using vector algebra and calculus, making measurements including error analysis, and working in Teams of three or four in the Practicals.

The course web-site (“the Portal”) is available at <http://portal.utoronto.ca>.

Table of Contents

People	page 1
What you need for this course	page 2
Marking Scheme	page 3
Important Dates and Deadlines	page 3-4
Classes (2%)	page 5
Practicals (15%)	page 6
MasteringPhysics Homework (9%)	page 7
Pre-Class Quizzes (1%)	page 8
Error Analysis Assignment (2%)	page 9
Math Assessment (1%)	page 9
Term Tests (30%)	page 9-10
Final Exam (40%)	page 10
Test and Exam Details	page 10-11
Plagiarism	page 11
Where to get Help	page 12
Syllabus	page 13-14

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Responding to Emails: We will endeavour to respond to email inquiries from students within 2 days. If you do not receive a reply within this period, please resubmit your question(s) and/or telephone the person you are trying to contact (leave a voicemail if necessary).

What you need for this course

- Required Text: “**Physics for Scientists and Engineers**” 2nd Edition (©2008) by Randall Knight.
- An **account on www.masteringphysics.com**. Online homeworks and pre-class quizzes will be assigned using this web-site.
- An **i-clicker** personal response system (looks like a white remote control), which is available at the U of T bookstore. You must register your clicker at www.iclicker.com using your student number. In-class quizzes and surveys will be given during *every* class (excluding the first class) using this device.
- A **calculator**. This need not be a graphing calculator but it should have SIN, COS, TAN on it as well as EE or EXP. A calculator will be allowed (and highly recommended!) as an aid during tests and exams.
- A **manual for the Practicals** freely downloadable from the Practicals webpage, which is available on the Portal. Each week you will be expected to bring the appropriate section of the manual to your Practical.

Note that the required textbook and the MasteringPhysics account can be purchased from the U of T Bookstore as part of a course package. There are three options open to you:

1. You can purchase a package with the textbook in one bound volume, at a cost of \$173.95, which also contains the MasteringPhysics Access Kit with E-book (the electronic version of the textbook), as well as the i-clicker rebate coupon.
2. You can purchase, at a cost of \$144.95, a binder-ready version which is not bound, but consists of a shrink-wrapped bunch of loose leaves with punched side holes, ready to be put into a binder. Like option 1, this package includes the MasteringPhysics Access Kit with E-book and the i-clicker rebate coupon.
3. You may elect not to purchase the textbook in physical form, but in its electronic (E-book) version, together with the MasteringPhysics Access Kit and the i-clicker rebate coupon, at a cost of \$93.50. Note that you will access the E-book through MasteringPhysics.

If you have already acquired a second-hand copy of the textbook, you will still need to purchase a stand-alone MasteringPhysics Access Kit at a cost of \$50. You won't find it on the Bookstore shelves but must ask for it at the desk. This comes without access to the E-book and without the i-clicker rebate coupon.

Marking Scheme:

Final Exam	40%
Term Tests on Oct. 4, Nov. 22 evenings	15% each
Teamwork performed during Practicals	15%
Online www.masteringphysics.com homework	9%
Online Pre-Class quizzes	1%
In-Class Clicker Questions	2%
Math Assessment Test	1%
Error Analysis Assignment	2%

Although all parts of the course are worth some marks to help motivate you, please keep in mind that the entire purpose of the classes, Practicals, MasteringPhysics, etc, is to help you learn the material of the course and do well on the assessment part: the tests and final exam, worth altogether 70% of your course mark.

Important Dates and Deadlines

All Practicals are in MP125 A,B or C.

All Pre-Class Quizzes are on www.masteringphysics.com .

All Homework is on www.masteringphysics.com .

Date	What
Monday Sept. 19 - Friday Sept. 23	First Practical
Monday Sept. 19 10 AM	Pre-Class Quiz 1 due: Chapters 2 - 3, Error Analysis document Section 1 - 4
Friday Sept. 23 11:59 PM	Homework 1 due: Chapters 2 - 3
Monday Sept. 26 10 AM	Pre-Class Quiz 2 due: Chapter 4 (first of two assignments due today)
Monday Sept. 26 11:59 PM	Math Assessment Online Test (second of two assignments due today)
Friday Sept. 30 4 PM	Error Analysis assignment, available on the Portal. A 3-page answer sheet must be printed and filled in. This is the first of two assignments due today.
Friday Sept. 30 11:59 PM	Homework 2 due: Chapter 4 (second of two assignments due today).
Tuesday Oct. 4 6:10 - 7:30 PM	Test 1: Chapters 1 - 4 and Error Analysis. Location TBA on the Portal.
Wednesday Oct. 5 10 AM	Pre-Class Quiz 3 due: Chapter 5. Note the non-standard day.
Friday Oct. 7 11:59 PM	Homework 3 due: Chapter 5
Wednesday Oct. 12 10 AM	Pre-Class Quiz 4 due: §6.1 - §6.3. Note the non-standard day.
Friday Oct. 14 11:59 PM	Homework 4 due: §6.1 - §6.3
Monday Oct. 17 10 AM	Pre-Class Quiz 5 due: §6.4, §6.6, Chapter 7
Friday Oct. 21 11:59 PM	Homework 5 due: §6.4, §6.6, Chapter 7
Monday Oct. 24 10 AM	Pre-Class Quiz 6 due: Chapters 8 - 9
Friday Oct. 28 11:59 PM	Homework 6 due: Chapters 8 -9
Monday Oct. 31 10 AM	Pre-Class Quiz 7 due: Chapter 10
Friday Nov. 4 11:59 PM	Homework 7 due: Chapter 10
Wednesday Nov. 9 10 AM	Pre-Class Quiz 8 due: Chapter 11. Note the non-standard day.
Friday Nov. 11 11:59 PM	Homework 8 due: Chapter 11
Monday Nov. 14 10 AM	Pre-Class Quiz 9 due: §12.1 - 12.7.
Friday Nov. 18 11:59 PM	Homework 9 due: §12.1 - §12.7
Monday Nov. 21 10 AM	Pre-Class Quiz 10 due: §12.8 - §12.11, §14.1 - §14.4
Tuesday Nov. 22 8:10 - 9:30 PM	Test 2: Chapters 5 – 12. Location TBA on the Portal.
Friday Nov. 25 11:59 PM	Homework 10 due: §12.8 - §12.11, §14.1 - §14.4
Monday Nov. 28 10 AM	Pre-Class Quiz 11 due: §14.5 - §14.8, §15.1 - §15.3
Friday Dec. 2 11:59 PM	Homework 11 due: §14.5 - §14.8, §15.1 - §15.3
Monday Dec. 5 10 AM	Pre-Class Quiz 12 due: §15.4 - §15.5
Friday Dec. 9 - Tuesday Dec. 20. Exact day and time to be announced	Final Exam. The duration of the exam will be 2 hours. Location TBA on the Faculty web site.

Classes (2%)

Classes are intended as an introduction to some of the course material. There are two 50-minute classes per week.

Section L0101: Monday and Wednesday, from 11am to 12 noon in Convocation Hall (All classes start at 10 minutes past the hour and end precisely on the hour. Thus, the classes actually begin at 11:10am.)

Section L5101: Monday and Wednesday, from 5 to 6 pm in MP102 (All classes start at 10 minutes past the hour and end precisely on the hour. Thus, the classes actually begin at 5:10pm.)

The content of the two sections will be identical; students need only attend one or the other. Each L0101 class will be recorded (audio only) and, within a day or two, posted in two formats on the course web-site. Due to server-space limitations, the recordings may not be available beyond three weeks after they are posted. You can access the recordings by following the Audio Recordings link in the Portal course menu.

Please be aware that not all the material on which you will be examined will be discussed in classes. You will be asked to read sections in the textbook ahead of classes. Again, **although you may be responsible for the whole of the section, only *some* of it will be taken up by the lecturer.**

We will also conduct in-class, informal, multiple-choice quizzes in every class. To answer these, you will need the official U of T clicker, from i-clicker, which can be purchased at the U of T Bookstore. In-class quizzes will be marked both for participation and for correct answers. For your participation and answers to be recorded, you must register your clicker online on the i-clicker website. You must register under the same given name and family name that you have provided on ROSI; in the Student ID field, enter your 9-digit U of T student number. Note that, if you've registered your i-clicker in other courses with your alphanumeric UTORID, you can (and must) also register with your 9 digit student number; the two registrations will not interfere with each other.

The in-class quiz mark will count for 2% of the total course mark. To earn 1 participation mark, you must submit some answer to at least one in-class quiz question in at least 75% of all the classes, over the semester. Otherwise you will earn no participation mark. To earn an extra mark, you must earn a mark for participation, and you must give the correct answer to at least 50% of the in-class quiz questions that you submit over the whole semester, otherwise no mark will be awarded.

Discussions with others is **allowed** and even *encouraged* during these informal questions (though no shouting, please!!), but you must have your own remote and select your own vote in order to obtain points. **If a student uses more than one remote, both will be confiscated and both students associated with these remotes will receive an academic misconduct.**

We ***strongly recommend*** that every student obtain an i-clicker remote and use it for voting in every class. It will help you focus on the material, and will give you immediate feedback as to how well you are doing. Also, i-clickers may be used in other classes at U of T that you may take over your time here. If, however, you wish to opt out of in-class clicker questions altogether, you may do so with no penalty to your course mark. The in-class clicker questions count for 2% of the total course mark. If you let us know at the beginning of the semester that you do not wish to participate in this aspect of the course, we will redistribute your marks by adding 2% to the weighting of the final exam. So, if you are on the list of students who opt out of clicker use, your final exam will be worth 42%. To be on this list, you must contact the course coordinator no later than October 3, 2011, and indicate clearly that you do not wish to participate with clickers in this course. Any request to opt out of clicker use made after this date will be denied. Any request to opt back in after asking to opt out will also be denied after October 3, 2011.

Practicals (15%)

In addition to classes, you will meet regularly in groups of at most 36 for 2 hours in Practical sessions in MP125-A,B or C. Attendance is mandatory, and your grade is heavily penalized for absences (see “Cube of Absences Penalty” below). Each Practical session is led by two graduate student Teaching Assistants. The material is the same as what is being taught in classes, but your time will be spent in discussion, problem-solving, hands-on activities and teamwork. The goals are to deepen your understanding of the physics, develop your laboratory skills and analysis techniques, and get you used to working in Teams. (In this course we use the word “Group” to refer to all 36 students in a Practical session, and “Team” to refer to 4 students sitting together at a pod.)

Practicals will start in the week of September 19. See the Portal for a detailed schedule of Practical sessions and activities.

You are asked to select your Practical PRA section on ROSI **no later than 11:00pm, September 12**, after which time the PHY131 staff will divide each section into one or two groups of no more than 36 students. Changing Practical session or group after 11:00pm on September 12 is not encouraged. If, however, you must change your section after that date, do not do it on ROSI before first coming to MP129 to request the change. Only conflicts with other courses can normally be accepted as valid reason to change section.

You will be working in a Team with up to three of your classmates. There will be two Teaching Assistant Instructors present for each Practical. The detailed schedule with the hand-outs for all of the Practical activities is posted on the Practical sessions webpage, which is accessible from the Portal. Please download the hand-outs and have a look at them before each Practical. You do not need any special equipment or clothing for Practical sessions; just a calculator, something to write with, and enthusiasm!

Table assignments (or “pod” assignments) will be posted on the first day near the door of MP125. The seating assignments will be scrambled half-way through the semester. Your Team of 2 to 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. Each Practical session will include time for student questions and discussion. However, the “heart” of the Practical sessions will be a series of activities based on the material most recently discussed in class.

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.

The Practical sessions will count for 15% of your mark in PHY131F. A random selection of activities (one or two from each week) will be marked by one of your TAs. All teammates in attendance who share a notebook will share the mark for each activity. Each activity that is marked will be marked on integer scale from 0 to 4: 0 means “missing work or student was absent”, 1 means “seriously deficient”, 2 means “requires improvement”, 3 means “good, solid work”, 4 means “exceptional”. Only the very best work will be awarded a 4.

Your mark in Practical sessions is broken down as follows:

Notebook Mark 1 (worth 0% of course): After the first Practical, the lab books will be collected and marked. However, this mark will not count towards your Practical sessions mark. Instead it is intended to make our standards and requirements clear to you.

Notebook Mark 2 (worth 7.5% of the course mark): After the 5th Practical session, a random selection of Activities from sessions 2 through 5 will be marked. The decision of which Activities will be marked will be made after the books have been collected, and all Teams will have the same Activities marked.

Notebook Mark 3 (worth 7.5% of the course mark): At the end of the term, a random selection of Activities from sessions 6 through 10 will be marked. The decision of which Activities will be marked will be made after the books have been collected, and all Teams will have the same Activities marked.

“Cube of Absences Penalty”: Attendance at the Practicals is vital for your learning, and it is mandatory. If you do not attend, you are letting down your teammates. Therefore, even if you receive full marks for your work in Practicals, you will be *separately* penalized for unexcused absence or lateness in the following manner. The Practicals mark (worth 15% of the course mark) will be converted to a mark out of 100. The number of unexcused absences each student has will be cubed and deducted from this total out of 100. In effect, this means that one absence generates a 1% penalty in Practicals mark (0.15% of the course mark) in *addition* to getting zero on whatever is marked that day. Two absences generate an 8% penalty (1.2% of the course mark), three generate a 27% penalty, etc. Five unexcused absences means that a student will get a zero for the Practicals component, meaning 15% of the course mark is lost. If a student arrives more than 20 minutes late or leaves more than 10 minutes early, he or she incurs the “cube of absence” penalty for that day. However, the late or early-leaving student may still receive marks for the activities they perform with their Team.

“If You Have Time Activities (IYHT)”: IYHT Activities should not be attempted by any Teams until they have spoken to a TA and obtained permission. For each of Notebook Marks 2 and 3, one IYHT activity will be randomly selected along with the regular activities. Teams that did well on the chosen IYHT get a 0.5-point bonus, while Teams that didn't do it or tried but didn't do well on it get no bonus points.

MasteringPhysics Homework (9%)

To help you achieve a better grasp of the course material, we make use of a web-based tutorial system called **MasteringPhysics**. We recommend that you do MasteringPhysics homework completely on your own. Conquering MasteringPhysics on your own is important to your grade, as many test and exam problems will be very similar. This system is designed to be a study aid, not “extra work”. The problems offered on MasteringPhysics include extensive hints to help if you are stuck. There is a very slight bonus offered if you don't open all of the hints, but it is still possible to get 100% and open all the hints. We recommend you use scrap paper and a pen to work through the problems “offline”, similar to how you would work on them for a test or exam.

Instructions for accessing MasteringPhysics (MP) are provided in the access kit in one of the PHY131 packages that you should have purchased from the U of T Bookstore, or in the stand-alone access kit also available from the Bookstore. If you have opened a MasteringPhysics account within the last 18 months, it is still valid. To get started:

- Go to <http://www.masteringphysics.com/>
- Click on **Register New Students**.
- You will be asked for an Access Code, which came with your new textbook purchase, or which can be purchased separately from the U of T bookstore.
- You will be asked for your name. Use the exact same name that you gave on ROSI.
- You will be asked for a *Student ID*. This should be **your 9-digit student number**.
- You will choose a login and password which will provide you with access for 21 months.
- You will be asked for the course ID: it is **MPPHY131F11**
- Click on **Assignment List** in the upper-left corner of the screen to see the available assignments.

You may begin work on an assignment as soon as it is released and appears in the Assignment List, typically one full week before it is due. You may log out at any time. If you have partially completed a question, the system will remember where you are for the next time. If you have only completed some of the questions of an assignment, the system will remember that too. The percentage of available marks on a particular assignment will fall linearly to 50% by half an hour after the deadline and to 0% by one hour after the deadline. There is no time limit on how long you may take in completing an assignment except for the due date and time. Nonetheless, you should be sure to begin assignments well before the due date and time.

Each Problem Set must be completed by 11:59pm on Friday, and covers the material discussed in class that week. You should study the material of the problem set *before* attempting it. Students typically take about 1 to 3 hours to complete each Problem Set, although some people will take longer. You are allowed 4 attempts for each answer. Syntax errors in mathematical expressions are not counted as an attempt, provided the software recognizes them as such. If you successfully solve a question or part on a Problem Set without using any of the Hints you will receive a bonus of 1%. This bonus is yours for keeps, even if your total MP mark exceeds 100%.

MasteringPhysics uses the following algorithm in scoring problems:

- Every correct "main part" of the problem counts for 1 point.
 - Wrong answers receive 0 points.
 - If the question has subparts, students receive partial credit for each subpart answered, even if you are unable to obtain the answer to the main part. If the student requests the solution to a subpart, they will lose a percentage of credit, even if they are able to obtain the answer to the main part.
 - If the question is multiple choice, students lose $1/(n-1)$ points, when n is the number of options to choose from, for each unique wrong answer they submit.
 - Students receive a 1% bonus for not using hints.
 - After the entire problem has been completed, the student's total points are divided by the maximum points for the problem. This ratio can be greater than 1 if the student got mostly correct answers without using any hints.
 - The score for each problem is this ratio multiplied by the number of points available for each problem.
- Instructors assign points for each problem roughly in proportion to the amount of time we estimate each problem will take you.

If you wish to opt-out of the MasteringPhysics homework, there is an option to do so. Please see the note at the end of the section on pre-class quizzes, below.

Pre-Class Quizzes (1%)

It is important to read the material that will be discussed in class *before* that discussion! To convey to you the importance that you should attach to the reading assignments, you will be asked to answer a few simple questions on MasteringPhysics by 10:00am, either Monday or Wednesday each week. Please note that these quizzes do not require a thorough grasp of the material; just reading the material carefully should allow you to answer all questions correctly within a few minutes.

You are allowed **one** attempt for each answer. Each question counts equally towards your final mark on the Quiz. Each Quiz counts equally towards your final mark in the course.

We **strongly recommend** that every student obtains a MasteringPhysics account and uses it for the homework and pre-class quizzes. It is a very valuable learning tool, and if you devote the time to using the system properly, it will certainly help you learn, understand and master the course material. Also, marks on MasteringPhysics are generally quite high, partly because of the many hints available, and partly because there is no time limit. If, however, you wish to opt out of MasteringPhysics altogether, you may do so with no penalty to your course mark. MasteringPhysics homework and pre-class quizzes together count for 10% of the course mark. If you let us know at the beginning of the semester that you do not wish to participate in this aspect of the course, we will redistribute your marks by adding 3% to the weighting of each test, and 4% to the weighting of the final exam. So, if you are on the list of students who opt out of MasteringPhysics, your tests will be worth 36% of the course mark, and the final exam will be worth 44%. To be on this list, you must contact the course coordinator no later than October 3, 2011 and indicate clearly that you do not wish to participate in MasteringPhysics for this course. Any requests to opt out of MasteringPhysics made after this date will be denied. Also, if you opt out of MasteringPhysics, you must opt out of *both* the homework *and* the pre-class quizzes; you cannot opt out of just one or the other. Any request to opt back in after asking for an opt-out will also be denied after October 3, 2011.

Error Analysis Assignment (2%)

The Error Analysis Assignment is a web-based series of documents and exercises intended to discuss how an experimentalist in the physical sciences determines the errors in a measurement. The level is appropriate for beginning University students in the sciences. It should take between 3 to 5 hours to read this and complete the activities.

The assignment may be accessed through the Portal. Please print out the 3 page Answer Form (available in PDF format as a link from the first page), and fill in the answers on this form. Put a staple through the 3-page assignment, and deliver it to your Practical Instructor's drop-box which is at the base of the stairs near the elevators in the Burton Tower, which is the south part of MP. The due date is Friday, Sep. 30 by 4:00pm. Any lateness will incur a multiplicative penalty of 20% reduction per business day. Assignments received more than one week late will not be marked.

Math Assessment (1%)

Between Sep. 14 and Sep. 26, we will be conducting an online math assessment "test". The primary aim of this exercise is to provide you with an assessment of your math background. As an incentive for you to take the test, we are making it worth 1% of your course mark. To earn this mark, all you have to do is to answer all questions on the test, regardless of the correctness of your answers.

To take the test, go to <http://cwsei-diagnostics.sites.olt.ubc.ca/first-year-math-diagnostic/>. This link is also available on the front page of the Portal, in the menu on the left. For your "Personal Identifier Code (Given by your instructor)", please enter your 9-digit student number. For "Institution Name", please enter University of Toronto. Read and agree to the instructions on this page, and then click next. There are 20 math questions to be done in 60 minutes or less. These are to be done closed book and by yourself. To earn the 1%, you must complete the Math Assessment test by **Monday, Sep. 26 by 11:59pm**. On the last page, if you fill out your email address, you will be mailed your results so that you can assess your own mathematical strengths and weaknesses.

Term Tests (30%)

There will be two 80-minute tests, both held on a Tuesday evening, but at different times due to severe test-space limitations.

The dates and times of the tests are:

Test 1: Tuesday October 4, 6:10 PM: Based on Chapters 1-4 plus the Error Analysis Assignment

Test 2: Tuesday November 22, 8:10 PM: Based on Chapters 5-12

Test Conflict

You are expected to take notice of the date and time of the test (6:00-7:30pm on Tuesday for test 1, 8:00-9:30pm on Tuesday for test 2) when you enroll in other courses and choose tutorial and lab sections. While the coordinators of large 1st-year science courses make sure that no conflict between their tests occurs, there are hundreds of other courses students can take, and conflicts with many of these are unavoidable. It is the responsibility of students to arrange their course schedule accordingly.

An alternate sitting will be scheduled just before the main sitting of the test and will be reserved exclusively for students who can demonstrate an unavoidable conflict with another academic activity at U of T. Once an announcement has been made in class and on the Portal that registration for the alternate sitting has begun, such

students must register with the Course Coordinator's office in MP129 in person, before the registration deadline specified in that announcement.

By registering, a student makes a commitment to write at the alternate sitting, and not at the main sitting, unless they cancel their registration no later than October 2, for the first test, and November 13 for the second test (this can be done by email).

Missed Test

In the event that you miss a test for medical reasons, you must obtain a doctor's certificate on the official Student Medical Certificate. If you do not, you will be assigned a grade of zero for the test. You should also submit a declaration of absence on ROSI, but this alone is not acceptable as documentation. Please submit your documentation without delay to the Course Coordinator's office in MP129. If you miss a test for valid and documented reasons, it will count for 0% your other test will count for 30%. There are no make-up tests. If you miss both tests for valid and documented reasons, your final exam will count for 65%. and your Practicals for 20%.

Concerns with the marking of the test

If you have concerns about your test mark, please bring them to the attention of one of the course instructors without delay as they will not be considered later than 7 days after the test is handed back in your Practical.

Final Exam (40%)

A 2-hour final examination, administered by the Faculty of Arts & Science, will be held during the December examination period at a time specified by the Faculty and announced by late October. Detailed instructions will be posted on the Portal about a week before the exam.

If you miss the exam, or if you have concerns about its marking, you must contact the Faculty of A&S and follow their procedures.

Test and Exam Details

Both the tests and the final examination will consist of two sections:

1. A **multiple-choice** section. You will be asked to record your answers on an answer sheet with a soft-leaded pencil.
2. **One long problem or exercise** (two at the final exam) with a blank space in which you are expected to work out the answer and a box in which you write your final answer. To get full marks for this kind of question, not only must you have the correct answer in the box, but **you must show how you derived it** in the space provided.

Answers to the multiple-choice questions and solutions to long-answer problems will be posted on the Portal for tests only.

Aids Allowed

- Aid-sheet
At the mid-term and final exam, you can bring one handwritten (not typed), original (not photocopied) $8\frac{1}{2} \times 11$ sheet, on both sides of which you can write anything you please. In addition, an equation sheet with fundamental constants will be provided and will also be posted on the Portal a few days before the tests and the exam. You are expected to be conversant with basic SI nomenclature.

- Calculator

Only non-communicating calculators, with no infrared or wireless capability, can be used at quarterly tests and at the final exam. This rule will be strictly enforced. We recommend buying a cheap scientific calculator which can perform arithmetic operations and carries basic trigonometric and exponential functions. This is a worthwhile investment since you are likely to encounter similar restrictions in other university tests and exams.

Important Rules of Conduct

Please make sure that you know exactly when and where you are writing your tests or exam, and make every effort to arrive on time. You will be writing the test (but not the exam) with your Practical group, the one you are assigned according to the Portal. You are responsible for knowing which room has been assigned to your Practical group. This information will be posted on the Portal 4-5 days before, on a special page containing instructions for the upcoming test/exam. 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.

At a test or exam, you will not be allowed to carry on you any phone, blackberry, iPod, PDA or any communication device whatsoever. These must be switched off completely and left in your bag, which must be at least 3 metres away from you during the test or exam. Please refer to rule 7 in the Rules and Regulations section of the Arts and Science Calendar. Also, out of consideration for your fellow students, before you come in to classes, tests or the exam, please remember to disable any device that can beep (watches!) or otherwise emit sounds (cell phones!).

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. Every year, despite our warnings, a few students get themselves into trouble by disregarding this rule. Continuing to write after the end of a test or exam is a serious offence, and you can be sanctioned for it: see rule 11 in the relevant section of the ArtSci calendar. You stand to lose much more than any little extra marks you might have hoped to gain from it.

Plagiarism

The exchange of ideas between students is a vital part of the university experience. Many students like to discuss assigned problems with their colleagues, and there is nothing wrong with that. But discussion is one thing, and plagiarism another.

Discussion-Based Work (Practicals and In-Class Clicker Questions)

The idea with discussion-based work is that you think about a problem, discuss it with your friends, and then submit the best answer based on the discussion and your own thoughts. When two friends disagree about an answer, one or both must be wrong, so it is best to discuss further and work out the differences. Sometimes a consensus is needed in order to progress in a timely manner, and this is where good teamwork comes in. Teamwork is something we wish to help you learn in Practical classes.

The main pitfall in discussion-based work is when certain people do not participate. Sometimes the non-participant is quiet or thoughtful and is happy to let others lead the discussion entirely. Other times, one or two individuals dominate the conversation in an exclusive way, forcing others to keep quiet. If you are the quiet sort, it is important for you to try to participate in discussion-based work. If you are talkative, keep in mind that one of the best ways to master a subject is to try to explain it to someone else. It benefits everyone if you make the effort to include your teammates and peers in all discussion-based work.

The marks assigned to in-class clicker questions are a way of monitoring class participation. If you are not in class, you may not lend your clicker to a friend to get the marks for you. If a student is caught in class using more than one remote, both will be confiscated and both students associated with these remotes will receive an academic misconduct.

Unsupervised Individual Work (MasteringPhysics Homework, Pre-class quizzes, Error Analysis Assignment, and Math Assessment Test)

The point of individual work is to prepare yourself for the tests and exam. When you are stuck and find you cannot progress with something, 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 fully understand everything you write. Perhaps the best way to avoid plagiarism is, after having discussed how to solve a problem with someone else, to write your own version of the solution without looking at the other person's solution.

It is not so rare for students who collaborate to cross the borderline into plagiarism in good faith, without even noticing. If you suspect this is happening to you, please seek the advice of your teaching assistant, lecturer, or course coordinator. All of us will be more than happy to help you keep out of unwitting mischief.

Supervised work (Tests and Final Exam)

Tests and exams must be done individually, involving no communication at all with your friends. 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 or help from anyone other than the invigilators themselves. Invigilators are authorized to assign candidates whose behaviour they deem suspicious to another seat where they may finish writing the test/exam. The matter will then be referred for full investigation either to the Course Coordinator (for the tests), or to the Faculty (for the exam), as set out in the Code of Behaviour on Academic Matters. To put it more succinctly, candidates may look up for inspiration, down in discouragement, but emphatically not sideways for information.

Where to get Help

One of the difficulties some students have in a large course such as PHY131/2 is that they feel that they are isolated, left to sink or swim, and that they have nowhere to go with problems and questions. These feelings are understandable, but please believe that the staff of PHY131/2 and the Department really are on your side, ready to provide any help you may need. However, in order to obtain this help, *you* must be proactive and ask for it! So please do not be invisible and silent: we can only hope to address your problems if you bring them to us.

For particular types of questions and problems, here is some guidance on whom to consult.

- **Class Material:** For questions about the theoretical aspect of the course (the Physics discussed in classes), you may want to first approach your TAs at your Practical. Your TAs have office hours; please be sure to ask them when they are available outside of Practicals. If that doesn't help, then you should contact the current lecturer during his office hours. You may email physics questions, but you may find it more rewarding and productive to talk to your TA or Lecturer face to face.
- **Practicals:** For questions about the Practicals, your TAs are the first persons to approach. If that doesn't help, the Practicals Coordinator (who sits in MP129D) will try to help you. Your TAs and the Practicals Coordinator have office hours when they may be reached. For equipment and technical problems, the technologists in MP127 will try to help you; the best way to reach them is to knock on the door during regular business hours.
- **General Questions:** For any other question about the course, such as timetable problems, questions about your marks, or general advice, the Course Coordinator is the person to ask. You can catch him at any time he is in his office, and he will be happy to help you. It is recommended that you make an appointment by e-mail to make sure he is available for you when you come. To contact the Course Coordinator, send a message to:

phy131@physics.utoronto.ca

If you wish your message to be answered, identify yourself fully: Family name, given name, student number.

• **Complaints and Concerns:** If all else fails and you still feel unsatisfied with the way your concerns have been addressed, Prof. Stephen Morris, Physics Undergraduate Chair, will be pleased to talk to you. You can make an appointment to see Prof. Morris with Ms. Teresa Baptista in MP301, on the third floor of the McLennan tower.

• **Drop-in Centre:** In addition to these resources, the Department operates a Drop-In Centre, staffed by graduate students, where you may ask any question about Physics. It is located in MP200, right above the main lobby, in the small room at the North end. Starting a week or two into the term, the Centre will be open daily from 11:00am to 5:00pm, except on Monday and Wednesday when it will open at noon, and on Friday from 11:00am to 2:00pm. Check the schedule posted in MP200 or on the Portal under the Drop-in Centre link in the course menu.

Syllabus

Here is a class-by-class syllabus of the topics of PHY131 and the relevant textbook sections. The schedule may change somewhat as the term proceeds, see the Portal for the latest schedule.

Class Date	Topics	Textbook Reference
1 Mon. Sept. 12	<ul style="list-style-type: none"> • Introduction to PHY131: The structure of the course • What does a physicist do all day? • Motion Diagrams 	§1.1
2 Wed. Sept. 14	<ul style="list-style-type: none"> • Position, Velocity, and Acceleration • Problem solving • Scaling • Units 	§1.2 - §1.8
3 Mon. Sept. 19	<ul style="list-style-type: none"> • Introduction to Error Analysis • Kinematics in One Dimension 	Chapter 2. Omit "A Little More Calculus: Integrals" subsection of §2.3.
4 Wed. Sept. 21	<ul style="list-style-type: none"> • Vectors and Coordinate Systems 	Chapter 3
5 Mon. Sept. 26	<ul style="list-style-type: none"> • Acceleration • Kinematics in Two Dimensions • Projectile Motion • Relative Motion 	§4.1 - §4.4
6 Wed. Sept 28	<ul style="list-style-type: none"> • Uniform Circular Motion • Velocity and Acceleration in Uniform Circular Motion • Nonuniform Circular Motion, Angular Acceleration 	§4.5 - §4.7
7 Mon. Oct 3	<ul style="list-style-type: none"> • Error Analysis 	Error Analysis online document provided on the Portal
Test 1: Tues. Oct. 4 6:10 – 7:30 PM		
8 Wed. Oct 5	<ul style="list-style-type: none"> • Force and Motion 	Chapter 5
No class or Practical Mon. Oct 10: Thanksgiving		
9 Wed. Oct 12	<ul style="list-style-type: none"> • Equilibrium • Using Newton's Second Law • Mass, Weight, and Gravity 	§6.1 - §6.3

10 Mon. Oct. 17	<ul style="list-style-type: none"> • Friction • More Examples of Newton's Second Law 	§6.4, §6.6. Rolling Friction (§6.4) is omitted. §6.5 is entirely omitted.
11 Wed. Oct. 19	<ul style="list-style-type: none"> • Newton's Third Law 	Chapter 7
12 Mon. Oct. 24	<ul style="list-style-type: none"> • Dynamics II: Motion in a Plane 	Chapter 8
13 Wed. Oct. 26	<ul style="list-style-type: none"> • Impulse and Momentum 	Chapter 9
14 Mon. Oct. 31	<ul style="list-style-type: none"> • Kinetic Energy and Gravitational Potential Energy • A Closer Look at Gravitational Potential Energy 	§10.1 - §10.3
15 Wed. Nov. 2	<ul style="list-style-type: none"> • Elastic Collisions • Energy Diagrams • The Basic Energy Model 	§10.4 - §10.7
No class Mon. Nov 7. No Practicals Mon. Nov. 7 or Tues. Nov. 8		
16 Wed. Nov 9	<ul style="list-style-type: none"> • Work • Thermal Energy • Power 	Chapter 11
17 Mon. Nov. 14	<ul style="list-style-type: none"> • Rotational Motion • Rotation About the Centre of Mass • Rotational Energy • Calculating Moment of Inertia 	§12.1 - §12.4
18 Wed. Nov. 16	<ul style="list-style-type: none"> • Torque • Rotational Dynamics • Rotation About a Fixed Axis 	§12.5 - §12.7
19 Mon. Nov. 21	<ul style="list-style-type: none"> • Static Equilibrium • Rolling Motion • The Vector Description of Rotational Motion • Angular Momentum 	§12.8 - §12.11
Test 2: Tues. Nov. 22 8:10 – 9:30 PM		
20 Wed. Nov. 23	<ul style="list-style-type: none"> • Simple Harmonic Motion • Simple Harmonic Motion and Circular Motion • Energy in Simple Harmonic Motion • Dynamics of Simple Harmonic Motion 	§14.1 - §14.4
21 Mon. Nov. 28	<ul style="list-style-type: none"> • Vertical Oscillations • The Pendulum • Damped Oscillations • Driven Oscillations and Resonance 	§14.5 - §14.8
22 Wed. Nov. 30	<ul style="list-style-type: none"> • Fluids • Pressure • Measuring and Using Pressure 	§15.1 - §15.3
23 Mon. Dec. 5	<ul style="list-style-type: none"> • Buoyancy • Fluid Dynamics 	§15.4 - §15.5
24 Wed. Dec 7	<ul style="list-style-type: none"> • Entire Course Review, plus intro to PHY132 	none