

# Physics 1501A – Fall 2012

Enriched Introductory Physics I:	Physics 1501A
Lecturer:	Prof. Martin Houde <a href="mailto:mhoude2@uwo.ca">mhoude2@uwo.ca</a> <a href="http://www.astro.uwo.ca/~houde">http://www.astro.uwo.ca/~houde</a>
Lectures:	Monday, Wednesday, and Friday, from 9:30 am to 10:20 am.
Location:	Physics and Astronomy Building, Room 148 (PAB 148).
Required text:	<b>Sears and Zemansky's University Physics with Modern Physics</b> , 13 <sup>th</sup> edition, by H. D. Young and R. A. Freedman (Addison-Wesley, 2011).

## Contact information:

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I can be reached at my office, especially after class where I will do my best to reserve time to answer your questions. I can also be reached during the week through e-mail for simple inquiries, or to make an appointment. I will try to reply to e-mails within two working days of reception. You can also get help from the course's TAs.

Students should regularly check the course's WebCT OWL web site.

**Lectures:** Scheduled for Mondays, Wednesdays, and Fridays 9:30 to 10:20 am, Room 148, Physics & Astronomy Building (PAB 148). The first lecture will be on **Friday, September 7**, and the last lecture will be on **Wednesday, December 5**. I use chalk and a blackboard, and will post my complete lecture notes on WebCT OWL.

**Textbook:** The textbook required for this course is **Sears and Zemansky's University Physics with Modern Physics**, 13th edition, by H. D. Young and R. A. Freedman (Addison-Wesley, 2011). You don't need to bring the book to

class. The price for the book includes two years of web access to Mastering Physics (see below). You also need to purchase the **First-Year Laboratory Manual**. Both are available at the UWO bookstore. If you buy a used textbook, you will need to purchase access to Mastering Physics online if you want it (*not mandatory*; it is fairly expensive). The paper and cloth editions of the textbook have the same contents.

**Calculator:** In contrast to some other first-year courses, there is *no specific model* of calculator that is required in Physics 1501A. You may use any standard scientific calculator. Please remember to bring it to exams – we don't supply loaners.

**Tutorials:** Physics 1501A has tutorials hosted by the course's TAs. They occur **Mondays 3:30-5:30 pm** (note the later starting time compared to the labs) on the weeks between labs, and are divided into two sections. You are expected to attend tutorials. If you wish to attend the other section, that's fine. It is very important to try at least some of the suggested problems before coming to the tutorial, and to bring with you any questions about the problems, about lecture material, and about your reading of the textbook. The first tutorial is on **Monday, Sept. 17**.

Section	Tutor	Students	Location
001	Alex DeSouza	A - L	PAB Room 34
002	Arash Akbari-Sharbat	M - Z	PAB Room 36

**Laboratories:** *In order to pass the course, you must pass the laboratory component.* Labs are held alternate **Mondays, 2:30-5:30 pm** in the Materials Science Addition (MSA) Building. The first lab is on **Monday, September 24**. Information about the lab is available on the lab WebCT site: <http://owltoo.uwo.ca>. The general lab information is posted on the web site: <http://www.physics.uwo.ca/undergraduate/labyr1/index.html>

Note: a laboratory orientation lecture will be posted on the lab WebCT site by the first week of September. You must visit the lab WebCT site and familiarize yourself with the contents of this lecture before attending your first lab class. Physics 1501A lab is divided into (up to) three lab sub-sections: A, B and C. The lists of students assigned to lab sub-sections, A, B and C will also be posted on the lab WebCT site. The Physics 1501A laboratory timetable will be posted at the above lab WebCT site. You must find your correct lab section, lab subsection, and the correct laboratory timetable before attending the first lab. Please attend the correct lab class on the correct date, as we do not give permission to attend lab classes outside your laboratory schedule. If you have difficulty following the timetable scheduled for your lab sub-section, please contact the laboratory coordinator, Dr. K. Kaluarachchi at

[kanthi@uwo.ca](mailto:kanthi@uwo.ca). There are different first year laboratory manual packages at the bookstore. Physics 1501A, 1401A and 1301A courses use the same package, but 1028A uses a different one. Make sure you buy the correct laboratory package since it is not refundable. The items listed in the table of contents given on the cover page must be included in the lab package. Open the package immediately and check. You must deal with the bookstore if items are missing. The laboratory staff cannot refund money later for any missing items. Note that if you passed the lab during a previous attempt at a first-year physics course (Physics 1501, 1301, 1401, 1020, 1024, 1026) within the past three years, you may get exempted from the lab portion of the course. Check the laboratory WebCT page for more information and contact Dr. Kaluarachchi ([kanthi@uwo.ca](mailto:kanthi@uwo.ca)) to discuss lab exemption.

### Tutorial / Laboratory / Exam Schedule

Sept. 17	Tutorial
Sept. 24	Lab: Measurements (all sections) (A) MSA 2220 (B) MSA 2230 (C) MSA 2250
Oct. 1	Tutorial
Oct. 5	<b>Term Test 1</b>
Oct. 8	<i>Thanksgiving Holiday</i>
Oct. 15	Lab: (A) v, a, F, MSA 2220 / (B) 1-D collisions, MSA 2230 / (C) Work & energy, MSA 2250
Oct. 22	Tutorial
Oct. 26	<b>Term Test 2</b>
Oct. 29	Lab: (A) 1-D collisions, MSA 2230 / (B) Work & energy, MSA 2250 / (C) v, a, F, MSA 2220
Nov. 5	Tutorial
Nov. 12	Lab: (A) Work & energy, MSA 2250 / (B) v, a, F, MSA 2220 / (C) 1-D collisions, MSA 2230
Nov. 19	Tutorial
Nov. 21	<b>Term Test 3</b>
Nov. 26	Tutorial
Dec. 3	Tutorial
Dec. 8-19	<i>December Exam Period</i>

**Assignments:** You will receive lists of suggested problems during the semester. At times, I will request that you turn in specific problems as assignments; there will probably be three such assignments during the semester. Students will be allowed to discuss the material among them, **but each student will have to turn in her/his own copy of the assignment**. Assignments must be turned in at the requested date. However, a student may miss a due date *once* during the semester, and hand in the late assignment on the following lecture day without incurring any penalty. Otherwise, for *every day* for

which they are late, assignments will automatically have a third of the maximum number of points subtracted from their total.

**Mastering Physics:** This online tutoring system will lead you step-by-step through learning material, making sure that you keep pace. An access code is included with your textbook, and you cannot use someone else's code. You should go to <http://www.masteringphysics.com>, choose Young & Freedman's University Physics 13th edition, and enroll in for the course (the course ID is **MPHOUDE99316**). Please use the first part of your official e-mail address as your Student ID. For example, myname23@uwo.ca would be entered as myname23 only. The purpose of Mastering Physics is to help you learn, not to test you. Thus, by the time you complete a problem set, you should understand all the problems and, hopefully, the general methods that can be applied to any problems in that chapter. ***Please note that Mastering Physics is only a learning tool, it is optional (you are not required to use it) and no grades will be based on its use.***

**Term Tests:** There will be three in-class term tests, each lasting 50 minutes, on the following dates: **Friday, 5 October; Friday, 26 October; and Wednesday, 21 November.** These are non-cumulative, which means that no question will specifically aim to test your knowledge of a topic from before the previous test, but basic material (e.g.  $F=ma$ ) could also be needed to solve the problems on any test. Bring any type of calculator; a formula sheet will be supplied. The tests will consist of problems to be worked out. This means that you must start from fundamental principles to develop the formulae that describe the mathematical model of the physical situation, explaining your reasoning as you go. At the end you may or may not be required to obtain numerical answers; if you are, you will be required to maintain control of numerical accuracy to three significant digits and to include units. There will likely be only two problems on each term test.

**Final Exam:** Three hours long, covers material of the entire course. Bring a calculator; a formula sheet will be supplied with exam. Date, time, and location are to be announced. It will be similar in format to the term tests, most likely with five problems.

**Grading:**

Assignments	15%
Laboratories	15% (Note: <b><i>In order to pass the course, you must pass the laboratory component.</i></b> )
Term Tests (10+10+10)	30%
December Exam	40%

Please note: The Department of Physics and Astronomy may, in rare cases, adjust the final course marks in order to conform to Departmental policy.

## **University Policies:**

**Accessibility:** Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x82147 for any specific question regarding an accommodation.

**Religious holidays:** A student who, due to unavoidable conflicts with religious holidays which (a) require an absence from the University or (b) prohibit or require certain activities (*i.e.*, activities that would make it impossible for the student to satisfy the academic requirements scheduled on the day(s) involved), is unable to write examinations and term tests on a Sabbath or Holy Day in a particular term shall give notice of this fact in writing to his or her Dean as early as possible but not later than November 15th for mid-year examinations and March 1st for final examinations, *i.e.*, approximately two weeks after the posting of the mid-year and final examination schedule respectively. In the case of mid-term tests, such notification is to be given in writing to the instructor within 48 hours of the announcement of the date of the mid-term test. The instructor(s) in the case of mid-term tests and the Dean in the case of mid-year and spring final examinations will arrange for special examination(s) to be written at another time. In the case of mid-year and spring final examinations, the accommodation must occur no later than one month after the end of the examination period involved. It is mandatory that students seeking accommodations under this policy give notification before the deadlines, and that the Faculty accommodate these requests. The list of approved dates is updated annually and is available at Departmental, Dean and Faculty advising offices.

### **Medical accommodation:**

- If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see:

[http://www.uwo.ca/univsec/handbook/appeals/accommodation\\_medical.pdf](http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf)

- A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here:  
<http://www.uwo.ca/univsec/handbook/appeals/medicalform.pdf>

#### **Academic misconduct:**

- **Cheating:** University policy states that cheating is a scholastic offence that can result in an academic penalty (which may include expulsion from the program). If you are caught cheating, there will be no second warning. Complete information on the University policies on academic offenses can be found at  
[http://www.uwo.ca/univsec/handbook/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf)
- **Plagiarism:** Students must write their essays and assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing (such as footnotes or citations). Plagiarism is a major academic offence. For more details, see  
[http://www.uwo.ca/univsec/handbook/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf)
- Plagiarism or cheating will not be tolerated. Penalties will vary depending on the seriousness of the offence. They can range from a grade of zero on an assignment or essay, to failure of a course, to expulsion from the University.
- If you have any questions at all on this issue please consult with your instructor.

### **Calendar Description**

Enriched Introductory Physics I. A calculus-based, laboratory course for students intending to pursue further studies in science, particularly the physical sciences. Newton's Laws, energy, linear momentum, rotations and angular momentum, gravitation, and planetary motion.

### **Course Outline** (Numbers in parentheses refer to sections in the textbook.)

1. Newton's Laws (§4.1-4.6, 5.2-5.4)
2. Conservation of Energy (§6.1-6.4, 7.1-7.5)
3. Conservation of Linear Momentum (§8.1-8.5)
4. Conservation of Angular Momentum; Rotational Motion (§9.1-9.4, 10.1-10.7)
5. The Gravitational Interaction, with astrophysical applications (§13.1-13.5, 13.8)
6. Fluid Mechanics (§12.1-12.6)
7. *The Principle of Least Action (if time permits)*