

PHYS*1300 Fundamentals of Physics Fall 2017 Course Outline

University of Guelph
Department of Physics

Course Information

General Information

This course introduces students to fundamental phenomena in physics, with particular emphasis on applications to the biological sciences. Topics include: analyzing one-dimensional and two-dimensional motion; Newton's laws; momentum, energy and associated conservation laws; interactions between charges, resistive direct-current circuits; the fundamentals of waves, with applications to acoustics; ionizing radiation, radioactivity and medical applications. This course is designed for students who have not completed 4U Physics (or equivalent): students with credit in 4U Physics (or equivalent) may not take this course for credit.

Course Credit Weight: 0.5

Academic Misconduct

The University of Guelph takes a serious view of academic misconduct and will severely penalize students, faculty and staff who are found guilty of offences associated with misappropriation of others' work, misrepresentation of personal performance and fraud, improper access to scholarly resources, and obstructing others in pursuit of their academic endeavors. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor. Each student is assumed to be familiar with the regulations surrounding academic misconducts, as spelled out in the [Undergraduate Calendar academic misconduct section](#).

"In this course, your instructor will be using Turnitin, integrated with the CourseLink Dropbox tool, to detect possible plagiarism, unauthorized collaboration or copying as part of the ongoing efforts to maintain academic integrity at the University of Guelph.

All submitted assignments will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site."

Course Related Information and Contact

Quiz Room Location: SSC1101A

Laboratory Location: MacN301

Help Room: LIB370 (see CourseLink for operating hours)

Lost and Found: Lost and Found" is in the Quiz Room (SSC1101A).

Quiz Room Hours: Posted on courseLink – see Quiz Room Operating Hours

Main Course Contact

Quiz Room Supervisor	Office	Extension	Email
Cindy Wells	SSC1101A	52445	cwells@uoguelph.ca

Please contact the Quiz Room Supervisor with all course related inquiries and email immediately to report any illness or errors in your courseLink record.

CourseLink

Students in this course will need to use CourseLink to check their term marks. **As soon as possible, you should check that you can log in to CourseLink:**

- * Use a web browser to go to the [CourseLink website: http://courseLink.uoguelph.ca/](http://courseLink.uoguelph.ca/)
- * Follow the courseLink login instructions.

Instructors

Lecturer	Office	Extension	Email
Joanne O'Meara	MacN323	53987	omeara@uoguelph.ca
The Great Orbax	MacN435B	53993	orbax@uoguelph.ca
Josh Mogyoros	MacN453	53981	jmogyoro@uoguelph.ca

Lecture Sections

Section	Day	Time	Location
01	Monday, Wednesday and Friday	10:30am – 11:20am	THRN1200
02	Monday, Wednesday and Friday	1:30pm – 2:20pm	MACN105
03	Monday, Wednesday and Friday	4:30pm – 5:20pm	ROZH101

Text & Other Required Materials

1. **Textbook: Physics: An Algebra-based Approach** bundled with an access kit to the online homework system called Enhanced Web Assign (EWA). Available in the university bookstore or the co-op bookstore.
2. Students can also order the ebook with EWA from nelsonbrain.com (or from the bookstore) as a more economical option or for those who have second hand books access only can be obtained from nelsonbrain.com.
3. **Study Guide/Lab Manual (2017 printing)** Available for purchase in the Physics quiz room SSC1101A \$20.00. **Cash only please. Exact change appreciated. Booksale** - The Quiz Room will be open for the sale of manuals Thursday, Friday, Monday, Tuesday, Wednesday. September, 7,8 & 11,12,13 from 9am – 3 pm. After Sept. 13th during regular quiz room hours.
4. **Calculator** (get one with trig functions, e^x , etc.) **(Cell phones, graphing calculators, programmable calculators, and electronic devices are strictly prohibited from use in the quiz room or labs. They must remain off and in your book bags during your entire quiz room attendance. Failure to comply is considered a form of academic misconduct and can/will result in a minimum penalty of automatic quiz disqualification).**
5. **This Course Outline:** includes important dates and deadlines, lecture schedule, evaluation information, etc.
6. **(optional) iClicker** or a subscription to Reef polling: we will be using this classroom response system to facilitate in-class discussions. Please bring your clicker to class regularly or use your mobile device with a Reef subscription. See iclicker.com for more details.

Tentative Lecture Schedule

Week	Topics (Study Guide)	Textbook Chapters
1,2	<p>Kinematics</p> <ul style="list-style-type: none">– Unit conversion and sig digits (Study Guide 1.1)– Describing motion: speed, velocity, uniform motion (Study Guide 1.2)– Acceleration, non-uniform motion (Study Guide 1.3)– Acceleration due to gravity (Study Guide 1.4)– Vectors (Study Guide 1.5)– Displacement and velocity 2-d (Study Guide 2.1)– Acceleration in 2-d (Study Guide 2.2)	1,2,3,4

Week	Topics (Study Guide)	Textbook Chapters
3,4	Dynamics What controls motion? Forces and Newton's laws <ul style="list-style-type: none"> - Projectile Motion (Study Guide 2.3) - Uniform circular motion (Study Guide 2.4) - Forces and FBD (Study Guide 3.1) - Newton's 1st and 2nd law (Study Guide 3.2) - Inclined planes (Study Guide 3.3) - Newton's 3rd law (Study Guide 3.4) 	4,5,6
5,6	Energy & Momentum Another way of understanding motion <ul style="list-style-type: none"> - work (Study Guide 4.1) - kinetic energy and work-energy theorem (Study Guide 4.2) - gravitational PE and cons of energy (Study Guide 4.3) - Work done by friction (Study Guide 4.4) - Power (Study Guide 4.6) - momentum (Study Guide 5.1) - cons of momentum 1-d (Study Guide 5.2) - elastic and inelastic collisions (Study Guide 5.3) - cons of momentum 2-d (Study Guide 5.4) 	7,8
7,8	Electricity <ul style="list-style-type: none"> - Electric charge and charge transfer (Study Guide 6.1) - coulomb's law and electric force (Study Guide 6.2) - electric fields (Study Guide 6.3) - Field lines and motion of charged particles (Study Guide 6.4) - electric potential energy (Study Guide 6.5) - electric potential (Study Guides 6.6, 6.7) - current (Study Guide 7.3) - resistance and ohm's law (7.2) - batteries and electric circuits (Study Guide 7.3) - series and parallel wiring (Study Guide 7.4) 	19,20,21

Week	Topics (Study Guide)	Textbook Chapters
9,10	Waves & acoustics What are waves and how do they behave? <ul style="list-style-type: none"> - introduction to waves, oscillations and SHM (Study Guides 8.1, 8.2) - traveling waves (Study Guide 8.3) - superposition and standing waves (Study Guides 8.3, 9.1) - acoustic resonance (pipes) (Study Guide 9.1) - beats (Study Guide 9.2) - logarithms (Study Guide 9.3) - Loudness/intensity level, decibels (Study Guide 9.4) - Energy, Power, Intensity (Study Guide 9.5) - ultrasound, infrasound and applications (Study Guide 9.6) 	13,14
11, 12	Nuclear Physics <ul style="list-style-type: none"> - Structure of the nucleus (Study Guide 10.1) - Radioactivity (Study Guide 10.1) - Nuclear equations and balancing, types of decay (Study Guide 10.1) - Radioactive decay and half lives (Study Guide 10.2) - Attenuation (Study Guide 10.3) - Medical applications (Study Guide 10.3) 	24

Online Homework

In order to enroll in the EWA course page, you will need to use the following class key;

Section 01 (10:30am class) – uoguelph 6264 9091

Section 02 (1:30 pm class) - uoguelph 6841 8187

Section 03 (4:30 pm class) – uoguelph 3731 0544

During the course of the semester there will be 5-6 optional online homework (EWA) assignments for students to complete. Students have the option of completing these assignments or have their Final exam weight adjusted as shown below. Mandatory – use your university of Guelph userid when setting up your EWA account.

Evaluation

These **two** evaluation options are available to students as illustrated below. The course grade will be calculated based on the scheme that produces the highest grade:

Assessment	Scheme #1	Scheme #2
Quizzes (5x10%)	50%	50%
Online Homework (EWA)	8%	0%
Experiments (5x2%) (Pass=2%, Fail =0%)	10%	10%
Final Exam	32%	40%
Total	100%	100%

Evaluation of Quiz Marks

Quizzes are marked out of 10:

- **8/10 or higher receive 10 out of 10 (highest possible mark per unit)**
- **between 4.0/10 and 7/10 (inclusive) receive 2 marks per attempt**
- **less than 4/10 receive zero**

The partial mark of 2 does not add to a mark of 10. It is awarded on the condition you do not receive a “pass” on any attempt on a unit quiz. See the examples below.

Four examples:

1. A student earns 4.0/10 on the first quiz attempt, 6.0/10 on the second quiz attempt, and 8.0/10 on the third quiz attempt. Mark received: 10 out of 10.
2. A student earns 4.0/10 on the first quiz attempt, 5.5/10 on the second quiz attempt, and 7.5/10 on the third quiz attempt. Mark received: 6 out of 10.
3. A student earns 2.5/10 on the first quiz attempt, 4.0/10 on the second, and 7.5/10 on the third. Mark received: 4 out of 10.
4. A student earns 7.5/10 on the first quiz attempt and tries no further quizzes. Mark received: 2 out of 10.

Final Examination

Final Exam Date: Tuesday, December 12, 2017 11:30am-1:30pm

The final examination will consist of multiple choice questions.

Quiz Deadlines and Important Notes

Week	Date	Notes
0	Thursday, September 7	Quiz Room Opens for Writing
3	Friday, September 29	Last day for Quiz #1 Requirements: 1. Study Guide 1 2. Pretest 1
6	Monday, October 16 Due to the Monday/Tuesday holidays	Last day for Quiz #2 Requirements: 1. Study Guide 2 2. Study Guide 3 3. Pretest 2
7	Friday, October 27	Last day for Quiz #3 Requirements: 1. Study Guide 4 2. Study Guide 5 3. Pretest 3
9	Friday, November 10	Last day for Quiz #4 Requirements: 1. Study Guide 6 2. Study Guide 7 3. Pretest 4
11	Friday, November 24	Last day for Quiz #5 Requirements: 1. Study Guide 8 2. Study Guide 9 3. Pretest 5
12	Friday, December 1	Quiz Room closes for the semester at 4:00pm

Obtaining Help in the Course

1. Brief questions can be answered by the course professor after lectures. Otherwise, the instructor will be available during office hours. Office hours will be announced in class.
2. Scheduled help sessions – LIB370 (see Help room Hours on courselink)
3. Step-by-step problem solving exercises developed specifically for this course, covering each major unit at:
 - a. www.physics.uoquelfh.ca/~phyjlh/SPS/
 - b. www.physics.uoquelfh.ca/tutorials/tutorials.html

Laboratory

Laboratory Exercises

The laboratory activity will be assigned a pass or fail distinction by the TA at the end of the laboratory period. You must show your TA your results by the end of 90 minutes in the laboratory session. The remaining 20 minutes of your assigned time will be available for students to correct mistakes (when necessary) in order to allow for reassessment by the TA. **It is crucial that you read the instructions in your lab before you arrive for the experiment. Failure to adequately prepare for the session may result in a failing grade for that experiment.**

You selected a particular lab section when you registered for the course. You must attend **your** lab section; do not attempt to complete the exercise in another time slot. For all lab sections, each of the experiments will take place as follows:

Week	Date	Notes
1-2	September 11-22	Experiment #1 – Introduction to the use of motion sensors and Capstone
3-4	September 25-October 6	Experiment #2 – Newton's 3 rd law
6-7	October 16-27	Experiment #3 – Conservation of Energy
8-9	October 30 -November 10	Experiment #4 – Ohm's Law
10-11	November 13-24	Experiment #5 – Acoustics
12	November 27-December 1	Experiment #6 (optional) – Ionizing Radiation

Contact your lab TA immediately if you miss your scheduled lab.

Quiz Room Information

Quiz Room Protocol

- Students must show their U of G photo ID card in order to write a quiz.
- Only 1 quiz attempt per time slot allowed on same quiz group.
- Your 1st attempt should be at least 3 days before the deadline to allow for a possible 2nd or 3rd attempt. **NOTE: evening sessions take a max. of 250 students and will close when that number is reached.** All quizzes are available from week 1 and they can be written as early as you want. The dates above only reflect the last possible date that particular quiz is available to write.
- No credit will be granted for labs or quizzes completed during a previous semester.
- **Book Bag Lock (optional)** – Book bags are **not** allowed to be taken to your quiz writing station in the quiz room. The designated area for book bags is equipped with cables for locking (**you must bring your own lock**).
- If you absolutely cannot stay to have your quiz marked, you may leave it. It will be marked at the end of the quiz period and the mark posted. It will be available for you to look at for two further quiz periods.
- **All quizzes remain in the quiz room.**
- **Wait quietly to have your quiz graded by the TAs. If you miss hearing your name your quiz will be graded in your absence.**

Quizzes

You can in principle try quizzes in any order. However, note that quizzes are withdrawn on specific dates (see page 7), so these should be attempted as appropriate. A sample of each quiz is provided on Courselink for you to look at. The quiz tests mastery of that material, and so you may find that you do not pass the quiz on the first attempt.

You will need your University of Guelph photo ID card in order to write a quiz. The time allotted for each quiz is **20 minutes**. When you have completed the quiz, it is marked immediately by a tutor in your presence. In this way, no time is wasted teaching you things you already know, but the quiz will isolate those things (if any) you don't know. The tutor will give you help on the spot when time permits. It is important to emphasize the diagnostic aspect of this quiz; diagnosis is its prime purpose. It is of no value to write one if you are not prepared; you are wasting everyone's time. The level at which you are considered to have "mastered" the material is 80%, i.e., the "pass mark" is 8 out of 10.

Each quiz that is mastered contributes 10% toward your course mark. If you do not get 80% on your first attempt (and you may not), it doesn't matter. There is no stigma attached to failing this quiz; that is not its purpose. You may go away, study, and try again. The quiz will have served to show you what you must study for that section. Obviously there must be a limit to the number of times you may write a version for each

quiz, and this has been set at three. **You may not attempt more than one version of each quiz in a single day.**

During quizzes (as well as the final examination), you may use a pocket calculator (**graphing calculators or any other electronic devices are not allowed**). In the quiz room, each desk is provided with a sheet of formulae. A copy of this sheet will be included in the final exam. **No material in the form of quizzes or paper may be brought in or taken from your assigned station in the Quiz Room and all paper used when writing a quiz must be turned in.** You should visit the quiz room during the first week of the semester to see how the system operates.

Self-paced study is a new experience for most students. At best, **it permits you to work ahead in physics early in the semester**, freeing study time for other courses during heavy weeks. At worst, there is a temptation to leave things too late. To help pace students, deadlines are placed on quizzes.

Pretests

Before any quiz can be written for credit, a Pretest must be taken and passed at the minimum level of **60%**. These Pretests are designed to permit a self-examination of the **basic concepts and objectives** of the modules in question. **They are a necessary but not sufficient preparation to pass a quiz.** Each Pretest consists of a variety of simple questions in one of 4 formats:

1. multiple choice
2. true or false
3. pairwise matching
4. enter a number or symbol

The **Pretests** are delivered via Courselink. Follow the login instructions outlined on page 2 and this will enable you to take the **Pretest**. Upon completion it will be marked and an explanation provided for every question for which you selected the **wrong** answer. These should be studied carefully.

When you obtain at least 60% on the **Pretest (allow 1 hour for your mark to process)**, you may **then** proceed to the Quiz Room (SSC1101A) to write a quiz for credit.

If you failed to get 60%, you must repeat the **Pretest** until 60% is obtained. Pretests attempts are unlimited. The Pretest must be recorded in your course record as a pass before a Quiz for credit may be written.

Of course, you get the maximum advantage from these Pretests if you do them without help and, as much as possible, without aids (textbook, etc.).

It is a serious academic offence to copy, print or otherwise store this material or to attempt to alter it in any way.

Course and University Policies

Academic Misconduct – see page 1

Accuracy of Records

It is your responsibility to use Courselink to check that your marks are recorded correctly. Please check your record often and report any discrepancies immediately to the Quiz Room Supervisor (email address on page 2). As an aid, a 'Personal Record Form' is provided on Courselink. You should use this form to record your quiz attempts, etc., and from time to time check the computer record against your personal record.

Illness

If you are away for brief periods of time due to medical, psychological or compassionate reasons, see the Quiz Room Supervisor (email address on page 2) about consideration of extension of quiz deadlines, etc. For an extended illness, etc. (> 1 week), you should obtain a medical certificate or similar documentation and consult the quiz room supervisor or the instructor **immediately** in order to make up a missed quiz (do not wait to submit your document at the end of the semester). If you miss the final examination because of illness or for other reasons, see your Program Counsellor. Attendance at the laboratory is, of course, very important. If you miss a laboratory experiment because of illness, or for compassionate reasons, please see your laboratory instructor for possible academic consideration.

See the undergraduate calendar for information on regulations and procedures for [Academic Consideration](#)

Course Notices

From time to time, notices pertaining to the course will be posted on Courselink and given in lectures. ***It is your responsibility*** to keep yourself informed regarding these special announcements.

E-mail Communication

As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

Drop Date

The last date to drop one-semester courses, without academic penalty, is **Friday, November 3**. For regulations and procedures for Dropping Courses, see the [Undergraduate Calendar](#)

Accessibility

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact Student Accessibility Services as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or refer to the [SAS website](#).

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer.

Material recorded with permission is restricted to use for that course unless further permission is granted.

Course Evaluation

The Department of Physics requires student assessment of all courses taught by the Department. These assessments provide essential feedback to faculty on their teaching by identifying both strengths and possible areas of improvement. In addition, annual student assessment of teaching provides part of the information used by the Department Tenure and Promotion Committee in evaluating the faculty member's contribution in the area of teaching.

The Department's teaching evaluation questionnaire invites student response both through numerically quantifiable data, and written student comments. In conformity with University of Guelph Faculty Policy, the Department Tenure and Promotions Committee only considers comments signed by students. Your instructor will see all signed and unsigned comments after final grades are submitted. Written student comments may also be used in support of a nomination for internal and external teaching awards.

NOTE: No information will be passed on to the instructor until after the final grades have been submitted.

Conflicts with Midterm Exams in other Courses:

Sometimes students will have a conflict between a midterm exam in another course and either a lecture or a lab in this course. The University has a very clear and well-defined policy to cover this situation: the regularly-scheduled lecture or lab holds priority. In other words, it is the responsibility of the faculty member who has scheduled the midterm exam to make special arrangements with students who have conflicts. This policy is stated explicitly in the Undergraduate Calendar under the heading "Midterm Examinations".