PHYSICS and ASTRONOMY
PHYS 111: Physics 1
Winter 2016
Section 001: MWF 3:30 - 4:20 pm, STC 1012
Section 002: MWF 1:30 - 2:20 pm, MC 2066
Section 003: TTh 1:00 - 2:20 pm, PHY 145

CONTACT INFORMATION:

Instructor (sections 001 and 002): Steve Pfisterer
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Office hours: MWF 12:00 – 1:00 in my office, MWF 4:20 outside of STC 1012, or make an appointment by email

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Phone: 519-888-4567 x39124
Email: p2bohlou@uwaterloo.ca
Office hours: After class + Mondays and Wednesdays 1:30 to 2:30 in my office, or make an appointment by email

Quiz Teaching Assistant:
For any questions or queries about the quizzes and websites (especially the LEARN Quizzes) used in the course contact the quiz TA.
R. Henderson
Email: waterloo.phys111@gmail.com

COURSE DESCRIPTION:
An introduction to physics for students intending to concentrate their further studies in biology, dentistry, medicine and paramedicine; includes particle kinematics and dynamics, energy and momentum conservation, and rotational mechanics.

LEARNING OBJECTIVES:

At the end of the course you will be expected to be able to

- Identify key classical mechanics equations, which can be applied to predict the behaviour of objects in the universe, and solve these equations.
- Recognise situations where you can apply Newton’s laws to explain the motion of an object.
- Recognise situations where conservation laws can be applied to explain the behaviour of a group of objects.
- Develop a systematic problem solving approach. Use this approach to solve complex, abstract problems with confidence.
- Use a profound, but simple principle (symmetry) for gaining insight into and solving problems associated with rotating systems.
- Explain verbally and in writing the physics that controls real life situations.
- Move beyond popular misconceptions about the physical world, and replace them with reasoned argument.
RESOURCES:

- **Lectures**
  The purpose of these is to introduce the concepts of the course and demonstrate problem solving methods and techniques. Your instructor may provide online resources such as notes. Please check the course website on LEARN regularly.

- **Group problem solving classes**
  Once each week you will have the opportunity to discuss with colleagues in class and to work as a group to solve “context rich” problems that will promote an effective approach to problem solving.

- **LEARN**
  URL: learn.uwaterloo.ca
  The course website on LEARN will serve as a source of course information and resources (lecture notes, sample exams, ...). Weekly quizzes will also be administered through LEARN.

- **Textbook (College Physics, 10th edition, Serway and Vuille, Nelson Education Ltd.)**
  The textbook is available as a package from the bookstore that includes an access key for the online EWA learning environment and is available with or without an optional solutions manual.

- **Online assignments (Enhanced WebAssign)**
  Weekly assignments can be completed on Enhanced WebAssign (EWA), an online platform developed in conjunction with the textbook. Assignments are essential for practice but will not be used in the course assessment. EWA may be accessed through http://www.webassign.net using the course Class key: uwaterloo.on 8058 9115. Students may also opt to complete assignments from the textbook. Step-by-step instructions for accessing EWA can be found on LEARN.

- **Clickers**
  iClickers will be used as an in-class component of the lectures. iClickers can be purchased at the bookstore. Note that clickers may not be used in all lectures and some lectures may have more questions than others. Using more than one clicker in class will be considered a violation of academic integrity and will be reported to the Associate Dean. See iClicker registration on page 4.

TOPICS:

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<tr>
<th>Vectors</th>
<th>Tension and contact force</th>
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<td>Kinematics 1D</td>
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<td>Projectiles</td>
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<td>Relative velocity</td>
<td>Impulse and conservation of momentum</td>
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<td>Newton’s laws</td>
<td>Elastic and inelastic collisions</td>
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<th>Center of mass</th>
<th>Rotational motion kinematics</th>
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<td>Moment of inertia</td>
<td>Angular kinetic energy</td>
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<td>Angular momentum</td>
<td>Statics</td>
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ASSESSMENT:

Mandatory Assessments:

Final Exam (50 to 70%)
The final exam date will be set by the Registrar later in the term (start checking towards the end of October). Towards the last few weeks of the term, look for the “Final Exam” module in LEARN for instructions, previous exams, etc.

Note: only “Pink-tie” or “Blue goggle” calculators will be allowed in the midterm and final exams.

Midterm Exam (10 or 15%)
The date for the midterm is Thursday Feb. 11th from 5:30 pm to 7:00 pm. Information about the midterm, including example midterms, will appear on LEARN closer to the date of the exam.

Note: only “Pink-tie” or “Blue goggle” calculators will be allowed in the midterm and final exams.

Quizzes (20%)
Weekly Quizzes will be administered on the LEARN website. The Quiz consists of three randomly selected, multiple choice questions on the topics covered by the assignments of the previous week. These quizzes will be single attempt and MUST be completed within one hour of starting the quiz. It is recommended that you solve and understand your weekly assignment problems in an effort to improve your quiz scores.

The Quiz will be available each week from Thursday evening at 5:00 pm until the following Thursday at 5:00 pm, under the Quiz tab on LEARN. Extensions may be provided and will be posted on LEARN and announced in class. Answers to your quiz will be made available the Monday following Quiz.

Contact the Quiz TA (waterloo.phys111@gmail.com) immediately if you have a technical problem with the weekly quiz. Please state your name, student ID, time and nature of the problem clearly when contacting the Quiz TA.

Optional assessments:
In addition to the mandatory assessments described above, the course will also include optional assessments that will be graded partially on participation. Completion or partial completion of the optional assessments will reduce the weighting of the final exam (see mark breakdown below). It is strongly recommended that all students participate in the optional assessments.

Group Problem Solving and writing assignment (0 to 10%)
Each week (starting week 2) there will be a group problem class period, which will take place during your scheduled tutorial time. During this class, you will work with a group of up to four randomly assigned group members solving problems of varying difficulty. Teaching Assistants will be on hand to assist the problem solving process.

Writing assignment:
In conjunction with the group work class, you are expected to complete a weekly writing assignment that will be discussed at the beginning and handed in during each tutorial. This writing assignment will be a short summary of the material covered in the lectures, book chapter and assignments during the week. The summary should include any equations, which you think are necessary for this section of the course.
**Assessment**

The participation mark for the group work will be awarded for attendance and participation in the group work AND completion of the writing assignment, which is to be handed into the TA’s in the 1st 10 minutes of the tutorial. It is expected that the writing assignment be completed **prior** to the tutorial and writing assignments written **during** the tutorial will not be accepted for credit.

**Clickers (0-5%)**

Clickers will provide an opportunity for you to test your understanding of material during class. It will also provide an opportunity to learn from your colleagues and reinforce your own understanding by teaching them what you know (Teaching is the best way to achieve “deep” learning). Participation in clicker questions will earn up to 5% towards your final grade.

*What happens if I don't get a clicker/forget my clicker/miss a clicker session?*

As you can see from the course evaluation scheme, the grade component (5%) associated with clicker sessions is quite small. It is awarded for participation rather than correct answers. The grading scheme is set such that forgetting your clicker or missing a few classes will not impact on your grade. Accordingly no accommodation will be provided for missed clicker sessions.

*What do I have to do to get the full 5% participation grade?*

To obtain the full 5% for clicker participation, you must participate in at least 75% of the clicker questions. Participation at less than that level will be pro-rated accordingly.

*Why should I participate in clicker sessions when they count for little?*

Clicker sessions provide an anonymous, zero-risk way of demonstrating your grasp of course material, to yourself, and to us, as one of the class 'voices'. When response to a clicker question reveals a misconception in a substantial proportion of the class, we have the opportunity to go over that material. If you are choosing incorrect answers more frequently than the rest of the class, you may want to seek some extra help. That is up to you - we will not track how you are answering clicker questions.

*Note:* If a student is found using a fellow student's clicker, both students will be assigned a mark of 0 for class participation, and the offense will be reported to the Associate Dean for Undergraduate Studies, Science who may assess additional penalties.

**Clicker registration**

The serial number of your clicker must be registered with your student ID number by Monday Jan 18th, 2016 in order to receive participation marks. Registration is done through the course LEARN page (see “iClicker Registration” under Course Information).
**Course Marking Scheme**

The **extreme** ranges of the marking scheme are shown below. Clicker and group work are for participation marks and can vary from 0 to 5 and 10%, respectively. Any participation marks will reduce the weight of the final exam. It is still possible to achieve 100% without these elements but it is **strongly** advised to participate. The contribution of the midterm will be varied between 10 and 15% to maximise your overall grade.

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Online quizzes</td>
<td>20%</td>
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<tr>
<td>Clicker participation</td>
<td>5% to 0%</td>
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<tr>
<td>Group work participation</td>
<td>10% to 0%</td>
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<tr>
<td>Mid-term exam</td>
<td>15% to 10%</td>
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<tr>
<td>Final exam</td>
<td>50% to 70%</td>
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<td><strong>Total</strong></td>
<td>100%</td>
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The **best** overall mark will be calculated from the possible combinations of the marking schemes above.

**COURSE RULES/CONSIDERATIONS:**

*Office of Academic Integrity* provides relevant information for students, faculty and staff.

- **Academic Integrity**: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility.

- **Grievance**: Students, who believe that a decision affecting some aspect of their university life has been unfair or unreasonable, may have grounds for initiating a grievance. Students should read *Policy #70*, Student Petitions and Grievances, Section 4. When in doubt, students must contact the department’s/school’s administrative assistant who will provide further assistance.

- **Discipline**: Students are expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for their actions. Students who are unsure whether an action constitutes an offense, or who need help in learning how to avoid offenses (e.g., plagiarism, cheating) or about ‘rules’ for group work/collaboration should seek guidance from the course instructor, academic advisor, or the Associate Dean of Science for Undergraduate Studies. For information on categories of offenses and types of penalties, students should refer to *Policy #71*, Student Discipline. For information on typical penalties, students should check *Guidelines for the Assessment of Penalties*.

- **Appeals**: A decision or penalty imposed under Policy 33 (Ethical Behavior), Policy #70 (Student Petitions and Grievances) or Policy #71 (Student Discipline) may be appealed, if there is a ground. Students, who believe they have a ground for an appeal, should refer to *Policy #72* (Student Appeals)

**Students with Disabilities:**

- **AccessAbility Services**, located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If students require academic accommodations to lessen the impact of their disability, they should register with AccessAbility Services at the beginning of each academic term.
Changes to Course Outlines
- Revised course outlines will be posted on LEARN, if course details change

Calculators for midterm and final exams
- Note: Only “Pink tie” or “Blue goggle” non-programmable calculators are allowed in the midterm or final exam. Non-approved calculators will not be permitted. “Pink tie” or “Blue goggle” calculators can be purchased on campus (CampusTechShop, Write Stuff, ...). Additionally, permitted calculators purchased off campus can be approved by seeing a math advisor in MC 4023 (“Pink tie”).

Final Exam Period Travel:
- The final exam period is Apr. 10 to Apr. 25, 2016.
- Student travel plans are not considered acceptable grounds for granting an alternative examination time.

Conflicts with Scheduled Midterms
- If you have conflicts with a midterm (e.g. religious activities, varsity sports competitions, other course commitments), contact your instructor two weeks prior to the midterm to explain the nature of the conflict and to discuss possible accommodations. Note that student travel plans are not considered acceptable grounds for granting an accommodation.

Class Policy on Missed Midterms and Exams
- If you do not write a midterm, and have not made an arrangement with your instructor, your grade will be zero on that midterm. If you do not write the final exam, you will receive a final course grade of DNW (did not write), which is equivalent to 32%.
- If you missed a midterm or exam due to illness or another valid, documentable reason, you can avoid a zero grade / DNW through the 5 part process described below.

1. **Contact your instructor within 24 hours of the missed midterm or exam.** Phone messages and emails can be received 24 hours per day. Email is preferred.
2. Get documentation to explain your absence.
   a. If you are ill, have yourself examined at University of Waterloo campus Health Services before or within 24 hours of the missed exam. They will complete a Verification of Illness form (VIF) for you. Assessment of illness must be based on an actual examination before or within 24 hours of the midterm or exam rather than an account of how you felt several days ago. If you are ill on a weekend, during off-hours, while out-of-town or receiving ongoing care from a family physician or specialist, it is acceptable to provide documentation from other health service providers. Information should include date of physician assessment, dates of illness, level of incapacitation and whether the diagnosis was made by the physician or based on description by the student. If you do not have University of Waterloo’s VIF with you at the time you are seen by the external health service provider, or the documentation provided does not include the required information, you will need to go back and have them complete and sign the Verification of Illness Form. This official verification is necessary before any action can be taken.
   b. For other extenuating circumstances that are not illness related, for which the Verification of Illness form is not appropriate, official documented proof that something has occurred will be required (consult with your instructor). It is understood that sometimes events occur beyond your control so if in doubt, contact your instructor if you have a compelling reason.
3. Bring your documentation to the Science Undergraduate Office (ESC 253) once you are feeling better. Your instructor will receive notification automatically by e-mail once you have done so. Contact your instructor if you are unable to take your documentation to the Science Undergraduate Office within a week.

4. Bring a copy of your documentation to your instructor. **The Science Undergraduate Office does not do this.** You have two weeks from the date of the missed midterm or exam to clear your zero/DNW grade.

5. Your instructor will review the documentation and make a decision as to whether it will be accepted or if you will be assigned a grade of zero/DNW. **Note that filing documentation with the Science Office does NOT automatically excuse the missing of a midterm or exam.** The information provided on the documentation will be evaluated when deciding whether a student should be excused. Students should carefully consider the wisdom of missing a midterm or exam.

*Again, failure to carry out steps 1-4 above will result in a grade of zero on a midterm or a DNW on a final exam.*

The following rules apply when the student’s documentation has been found acceptable:

- mid-term exam: student may write scheduled make-up exam or, if make-up exam date has passed, weight of midterm will be transferred to the final exam
- final exam: deferred exam to be written next time course is offered

(updated Jan 1, 2016)