PHY 121: Mechanics—Fall 2015
An introductory course in physics for students intending to concentrate their future studies in the physical sciences, optometry or mathematics; includes particle kinematics and dynamics, forces in nature, work and energy, conservation of energy and linear momentum, rotational kinematics and dynamics, and conservation of angular momentum.

**Instructors**
Dr. Richard Epp  
Office: 241 Physics Building  
Email: rjepp@uwaterloo.ca  
Office hours: Mondays 10:30–12:00 (or just drop by M/W/F or send an email)

Dr. Robert Mann  
Office: 377 Physics Building  
Email: rbmann@uwaterloo.ca  
Office hours: Mondays 1PM (subject to revision)

**Note:** The TAs will also have office hours, which will be announced on UW LEARN.

**Textbook**
**Mandatory:** MasteringPhysics online assignment system.

**Optional:** Textbook: “University Physics with Modern Physics, 14th ed” by Young & Freedman.

**Optional:** Textbook solutions manual.

These three items are available in various bundled combinations at UW bookstore.

**Note:** This textbook is recommended both for its quality and the fact that it will be used for three courses: PHYS 121, 122, and 124. However, any textbook (earlier editions, or other new or used) will suffice as long as it covers similar material at a similar level, and is calculus-based.

**Tutorials**
There are four optional tutorials:

<table>
<thead>
<tr>
<th>Tutorial</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>TUT 001</td>
<td>3:30–4:50</td>
<td>Fri PHY 145</td>
</tr>
<tr>
<td>TUT 002</td>
<td>10:00–11:20</td>
<td>Tue MC 2066</td>
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<tr>
<td>TUT 003</td>
<td>1:00–2:20</td>
<td>Tue B1 271</td>
</tr>
<tr>
<td>TUT 004</td>
<td>3:30–4:50</td>
<td>Fri B1 271</td>
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You must attend your assigned tutorial time slot. Tutorials will include a brief overview of key concepts & formulas covered in the previous week’s lectures, plus one or more problems to be solved in self-selected groups of three students.

**Note:** The group problems will be marked (with each member of the group obtaining the same mark) and can earn you up to 5% bonus above your normal percentage course grade. The problems and solutions, as well as the bonus marks, will be posted afterwards on UW LEARN. The group problems will not be handed back, so if you want a copy, take pictures with your phone before handing them in.

**Weekly Assignments**
A new online Mastering Physics assignment will be posted each Friday and due, at midnight, a week after the following Monday (one week plus two weekends). Late assignments will generally not be accepted, and will be given a grade of zero. It is expected that an average student will spend approximately 2-3 hours per week on the assignments. If you find it is taking significantly longer or shorter to complete these assignments please speak with your instructor.

**Note:** Each assignment will have a bonus question(s) worth approximately 10% of the assignment, i.e., doing them can earn you up to about 2% bonus above your normal percentage course grade.

**Note:** For additional problem-solving practice (non-credit), students may do:
(1) additional Mastering Physics problems (answers only), (2) textbook problems (full solutions available in the optional solutions manual), or (3) the additional tutorial-style problems (with solutions) that will be posted on UW LEARN.

**Midterm Tests**
There will be two 80-minute midterm tests held during tutorials. You must write these tests during your assigned tutorial time slot. If a midterm test is missed for legitimate academic reasons the grade will be shifted to the final exam i.e., there will be no makeup test.

**Midterm test tutorials:**
- **Oct 20 & 23:** 1st 4 weeks of material
- **Nov 17 & 20:** 2nd 4 weeks of material

**Final Exam**
There will be a 150-minute final exam in December. The date will be set by the registrar by early November.

**Assessment**
Individual best of two options:
- Assignments  20%
- Midterm Tests  30%
- Final Exam  50%

or:
- Assignments  10%
- Midterm Tests  15%
- Final Exam  75%

**Note:** You must pass the final exam to pass the course.

**Weekly Course Content**  
(>approximate dates<)
- Sept 14       Applying Newton’s Laws
- Sept 21     Conservation of Energy
- Sept 28    Momentum & Collisions
- Oct 5      Angular Momentum
- Oct 12    Angular Momentum
- Oct 19    Angular Momentum
- Oct 26    Angular Momentum
- Nov 2      Angular Momentum
- Nov 9      Angular Momentum
- Nov 16    Angular Momentum
- Nov 23    Angular Momentum
- Nov 30    Angular Momentum

**Important Dates**
- Sept 14       Lectures Begin
- Oct 3        Drop, Penalty 1 Period Begins  
  (no penalty for courses dropped before this date)
- Oct 12    Monday Holiday (Thanksgiving)
- Nov 21    Drop, Penalty 2 Period Begins  
  (WD grade assigned for courses dropped before this date)
- Nov 21    Makeup day for Thanksgiving  
  (same as Monday schedule)
- Dec 4        Lectures End
- Dec 8        Exam Period Begins
- Dec 22     Exam Period Ends
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

“A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy #70, Student Petitions and Grievances, Section 4. http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm”

Discipline

“A student is expected to know what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offense, or who needs help in learning how to avoid offenses (e.g., plagiarism, cheating) or about ‘rules’ for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. For information on categories of offenses and types of penalties, students should refer to Policy #71, Student Discipline, http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm”

Appeals

“A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy #72 (Student Appeals) http://www.adm.uwaterloo.ca/infosec/Policies/policy72.htm”

Students with Disabilities

“The Office for Persons with Disabilities (OPD), 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 you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.”

Travel and the Final Examination Period

“Student travel plans are not considered acceptable grounds for granting an alternative examination time. (see http://www.registrar.uwaterloo.ca/exams/finalexams.html).”

Illness

If you are ill and are unable to complete one or more course elements you must obtain a “Verification of Illness” form from this URL: http://www.healthservices.uwaterloo.ca/Health Services/verification.html, have it signed by your doctor and bring it to the Science Undergraduate Office (Earth Sciences and Chemistry Building Room 253).

Accommodation for Missed Course Elements

If an assignment is missed for legitimate academic reasons the remaining assignments will be re-weighted to omit the assignment. If an exam is missed for legitimate academic reasons you will be required to write the exam the next time this course is offered. It is your responsibility to arrange to write the exam.

Most Importantly: Please talk to one of us if you have any problems at all—we are always happy to try to help!