



*PHYSICS I (PHYS.1410)*  
*Classical Mechanics*  
*Olney 150, MW 9am–9.50am*  
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**W**elcome to the second semester of the two-semester sequence in freshman physics for science and engineering majors. Please read this guide carefully since it outlines the materials that will be covered this semester and explains what the Freshman Physics Team expects of you. Guide sections include:

1. *Course Text, Website, Prerequisites, and Co-requisites*
2. *Course Description and Rationale, Goals and Student Learning Objectives*
3. *Course Outline*
4. *Course Format - Lecture, Recitation, and Tutoring*  
*Interactive Lecture Format*
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7. *Quiz Policy*
8. *Cancellation due to Snow*
9. *Attendance/Absence and Disabilities Policies*
10. *How Your Grade is Determined*
11. *Help If You Have a Problem*
12. *Physics Tutoring at UMass-Lowell*

The Freshman Physics Team, including the Professors and the Tutoring Staff, wants you to be successful in this course! Expect to put in a lot of time - it's a challenging course. Talk to us if you start to get lost or are confused about a concept. It's your responsibility to come to us for help - it's our responsibility and pleasure to help!

### *1. Course Text, Prerequisites, and Co-requisites*

**Text:** The textbook for the course is “Physics for Scientists and Engineers, a Strategic Approach,” Fourth Edition by Randall Knight (Pearson, 2016). The text comes either as a complete book set if you are taking three semesters of physics or a volume 1 set if you are taking only one semester of physics I. More information on the textbook is available on the Blackboard (BB) course page. Here you will find textbook information, the course policy, the homework assignments for the semester, and other information about the course and the Physics II team. Lecture notes will also be posted on this website.

*All homework will be submitted and graded primarily electronically via the Mastering Physics (MP) website [www.masteringphysics.com](http://www.masteringphysics.com). So while the masteringphysics.com access kit is **REQUIRED** for the course, you are **NOT** required to necessarily buy the latest edition or the exact version of the textbook*

offered at the bookstore. You could purchase an electronic edition, a used earlier edition, or even a different textbook entirely (although this is not recommended). Bundled packages containing the textbook (highly recommended), masteringphysics.com access kit (required) is available from the North Campus Bookstore. *More information on textbook bundles offered by the bookstore is available on the course website.*

*Co-requisites:* laboratory course PHYS.1410L.

## 2. *Course Description and Rationale, Goals and Objectives*

*Course Description and Rationale:* The first semester of a two semester sequence designed for science and engineering majors which covers the physics of Newtonian mechanics using calculus. Topics include kinematics in one and two dimensions, vectors, force and motion, impulse and momentum, energy, work, rigid body motion, gravitational theory, and oscillations. Chapters 1 through 15 will be covered.

*Course Goals:* The introductory physics course sequence for engineers and scientists is intended:

- a) Develop an appreciation for the fundamental understanding of physical phenomena;
- b) Develop the ability to use mathematical reasoning and tools needed to model physical phenomena.
- c) Develop learning strategies for successfully completing demanding science and engineering courses.

*Student Learning Objectives:* The following are some examples of the specific learning objectives on which you will be tested in the homework assignments, quizzes, three one hour examinations and the final examination:

- a) *Be capable of demonstrating a conceptual understanding of the various topics covered in the course.*
- b) *Be able to apply physical laws to various observed phenomena.*
- c) *Be able to approach scientific and engineering problems in a professional manner,*
- d) *Be able to demonstrate the ability to apply mathematical tools such as vectors, geometry, algebra, trigonometry, and calculus to physical problems,*
- e) *Be capable of using problem-solving skills to solve a variety of physical problems.*

## 3. Course Outline\*

<i>Lecture</i>	<i>Sections in Book</i>	<i>Material Description</i>
L1	Chapter 1.8	Unit and Significant Figures
L2	Chapter 2	One dimensional motion
L3	Chapter 2	Motion with constant acceleration
L4	Chapter 3	Vectors
L5	Chapter 4	2D kinematics
L6	Chapter 4	Non/Uniform circular motion
L7	Chapter 5	Forces. N, 1 <sup>st</sup> and 2 <sup>nd</sup> Laws
Oct. 1	Ch.1-4	Exam 1
L8	Chapter 6	Using N. 2nd law
L9	Chapter 6	Friction
L10	Chapter 7	Newton 3 <sup>rd</sup> law. Tension
L11	Chapter 8	Motion in a plane
L12	Chapter 9	Work and Kinetic Energy, Power
Oct.22	Ch.5-8	Exam 2
L13	Chapter 10	Potential Energy, Conservation of Energy
L14	Chapter 11	LinMoment, Cons of Momen, 1D collision
L15	Chapter 11	Impulse, 2D collision
L16	Chapter 12	Center of Mass, Rot. Energy, Moment of Inertia
L17	Chapter 12	Torque, Rot. Newton 2 <sup>nd</sup> law
Nov. 19	Ch.9-11	Exam 3
L18	Chapter 12	Angular Momentum, Vector product
L19	Chapter 12	Conservation of Angular Momentum
L20	Chapter 12	Static Equilibrium
L21	Chapter 13	Newton's Law of Gravity
L22	Chapter 15	Oscillations
L23	Chapter 15	Pendulum
TBA		Final Exam

## 4. Course Format – Lecture and Recitation

The course meets two times per week in Olney 150. The lectures will cover new material and the recitation classes will be used to discuss the lecture material, work out sample problems, and administer weekly quizzes. Keep all course material in a folder or binder in an organized fashion. Organization is a major key to success in this course.

There will be three exams during the semester and a final. The three exams will be given during lecture times. See the next section on exams for the schedule. Quizzes and Homework are discussed below. Your instructor is happy to go over a particular homework problem or concept during his/her office hours. Free tutoring is available at the Physics Department tutoring center (not in a Summer semester) or in the Learning

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\* May be modified as Semester unfolds

Center. There will be evening review sessions before each exam. See sections below for more details.

### 5. Examinations and Examination Schedule

The common exams for all sections will be given during lecture times on the dates given below. In addition, there will be a 3 hr final examination during finals week. The place and time for the final will be posted later in the semester with the finals schedule. You are required to attend each exam at the officially announced time.

For each exam session, you must bring pencils, erasers and a calculator. Only ordinary calculators are allowed. Alphanumeric calculators (those that include written formulas in their display modes) are NOT permitted. All formulae needed for an exam are provided on sheets attached to the exam.

There will also be exam review sessions with a physics instructor in the evenings prior to the scheduled exams (not in a Summer semester). Dates and times will be announced.

#### *Exam Schedule- Fall 2018\*\**

Date	Exam	Material Covered
<i>October 1</i>	<i>Exam 1</i>	<i>Chapters 1 - 4</i>
<i>October 22</i>	<i>Exam 2</i>	<i>Chapters 5 - 8</i>
<i>November 19</i>	<i>Exam 3</i>	<i>Chapters 9 -11</i>
	<i>Final</i>	<i>All covered Chapters (exclusions will be announced)</i>

### 6. Homework Assignments:

Regular homework assignments, typically ten problems a week, will be done ONLINE at [www.masteringphysics.com](http://www.masteringphysics.com). A registration for Mastering Physics must be done through the BB page.

course name: *PHYS1410Fall2018*

course ID: *danylov91964*

These will be due at the end of each week (usually every Sunday at 11.59 pm), and will focus on the material covered in that week. These will constitute 100% of your final homework grade. For these, you will be allowed 6 attempts to input the correct answer. Your total HW grade will be reduced 25% for each day past the due date that the HW is submitted. You should be able to see your online HW scores as soon as you finish the HW set.

You have to do many more than just the assigned homework problems to learn the material in the course. Problem solving skills is one of the most important learning goals of this course. One of the best ways to do homework is to form small groups and work the problems together. Remember, the *Mastering Physics* software randomizes the variables for each problem, so everyone will have different answers for each problem. However, the way you solve the problems will be similar, and this can be worked out in groups. Assigning one or two problems to

\*\* The Schedule may change as a result of changes in the University Schedule.

each member in the group is NOT an effective way of doing homework! In order to do well in this course you must have a good understanding of the homework, so if you work in a group, make sure you understand how to do each problem!

*Working on Physics as a team will improve your grade.*

### 7. Quiz Policy

Recitation instructors will typically give at least *one quiz per week*. These can be *announced or unannounced*. They will typically cover recent material and be similar to the homework problems. Students must come to class with calculators. Unexcused absences for a quiz will result in a grade of "0" for that particular quiz.

### 8. Cancellation Due to Closing of University

If the University closes due to a snow emergency we will pick up where we left off. At the next lecture a revised schedule will be posted to work around the lost day. If the closing causes a cancellation of an exam, the exam will be rescheduled and the revised date announced during the first lecture scheduled after the cancelled day.

### 9. Attendance/Absence and Disabilities Policies

Attendance is required in all recitations and lectures. *There are no make-up examinations*. Illness on the day of a major examination must be verified by submission of a letter from a physician or nurse showing that you were seen prior to or on the day of the examination and attest that your illness made you unable to take the examination. Any other unusual situation needs your recitation instructor's approval in writing. All other absences, i.e. varsity sports, family weddings etc., must be made one week in advance by written request and approved by your instructor. *Only one approved major examination absence is allowed*. In that case your grade will require increased emphasis on the other in-class exams or the final examination (see below).

If you have either a *learning disability or severe physical handicap* you may be eligible for extra time during exams and the final. Discuss your situation with the UMass-Lowell Counseling Center (978) 934-4331. A properly filled out *Learning Disability Accommodation Notification* form must be filled out and a copy given to your recitation and lecture instructor in order for us to accommodate your needs. All information will be kept confidential.

## 10. How Your Grade is Determined

Your letter grade is based on the total points you earn, as follows:

100 pts	Homework
100 pts	Quizzes
100 pts	Exam 1
100 pts	Exam 2
100 pts	Exam 3
200 pts	Final
50 pts	Lecture Attendance
<i>Total</i>	<i>750 pts</i>

At the end of the semester, after all grades including the FINAL EXAM are added together, your lecture instructor in consultation with all the recitation instructors will determine the point cutoffs for the various letter grades. The following table provides the cutoffs that were used in the previous few semesters, and is most likely to be continued this semester. You can use the table to estimate your letter grade as you progress through the course by comparing your point total (or percentage) with the expected cut-offs.

Grade Conversion Table\*

	%	Approx. Points
A	90% - 100%	$\geq 675$
A-	85% - 90%	637.5 - 675
B+	79% - 85%	592.5 - 637.5
B	73% - 79%	547.5 - 592.5
B-	66% - 73%	495 - 547.5
C+	59% - 66%	442.5 - 495
C	51% - 59%	382.5 - 442.5
C-	45% - 51%	337.5 - 382.5
D+	40% - 45%	300 - 337.5
D	35% - 40%	262.5 - 300
F	0% - 35%	$< 262.5$

\*(The cut-offs for this semester determined at the end of the course may differ slightly from that listed above)

Note: An *unexcused* absence from an Exam will result in a "0" for the exam. An unexcused absence on the final will result in a course grade of "F".

### 11. Help if You Have a Problem

If you have a problem, your recitation instructor is the first person you should contact. For help on the course work, arrange a meeting with your recitation instructor or one of the tutoring centers. The instructors will provide you with their specific office hours. They will also see you by appointment at mutually convenient times if you can't make office hours. For major unresolved problems contact A. Danylov (contact info at the top of this document).

### 12. Academic Conduct and Integrity

You are responsible for proper academic conduct - please refer to the university's academic integrity policy at the following URL:

[http://www.uml.edu/catalog/undergraduate/policies/academic\\_dishonesty.htm](http://www.uml.edu/catalog/undergraduate/policies/academic_dishonesty.htm)

The basic rule of thumb is simple: you should not try to receive credit for work you have not performed. This means, e.g., that you must do your own homework assignments and take your own exams and quizzes. If you are struggling in the course, meet with your recitation instructor to figure out how we can best help you. There are no easy (ethical or otherwise) ways to pass this course, but we are dedicated to ensure you have the best support possible to succeed.

### 13. Physics Tutoring at UMass-Lowell

The Center for Learning and Academic Support Services, Southwick 308 provides peer drop-in tutoring conducted by senior undergraduates who have been recommended by faculty. It is your responsibility to figure out which of the many aids offered (recitation instructor office hours, Physics department tutoring center and UML tutoring center) work best for you.

<http://www.uml.edu/CLASS/Tutoring/Drop-In-Tutoring.aspx>

See Suzanne Gamache at the Tutoring Center (3rd floor Southwick) for more information and an up-to-date schedule on physics tutoring.

Contact: [Suzanne\\_Gamache@uml.edu](mailto:Suzanne_Gamache@uml.edu) (978) 934-2947