

Physics 141: Principles of Physics I Fall 2011

Sections 0102, 0103, 0104, 0105 Syllabus

COURSE DESCRIPTION	<p>This course is the first of a two-semester series in general physics (with PHYS142). The first semester covers the fields of mechanics and thermodynamics. This <i>survey</i> course will use calculus and is recommended for chemistry and related majors. It also satisfies the requirements of medical and dental schools. Note that MATH141 or MATH221 is a <i>co-requisite</i>.</p> <p>This course is designated a CORE Physical Science Lab (PL) Course</p>																																														
STAFF	<p>INSTRUCTOR Dr. Daniel Hertz (email: dbhertz@umd.edu, phone: 301-405-4276) <i>Office hours:</i> Monday and Wednesday 9:00–10:00 am PHY 3102, and by appointment I am far easier to reach by email than phone and will usually respond to emails the day I receive them</p>																																														
	<p>DISCUSSION AND LAB TAs</p> <table border="0"> <thead> <tr> <th>Name</th> <th>Email</th> <th>Office hours</th> </tr> </thead> <tbody> <tr> <td>Megan Marshall</td> <td>mmarsha7@umd.edu</td> <td>W 1:00–3:00 pm PHY3101</td> </tr> <tr> <td>Huong Vu</td> <td>huongvu@umd.edu</td> <td>M 1:00–3:00 pm PHY3103B</td> </tr> <tr> <td>Tung-Chang Liu</td> <td>tcliu@umd.edu</td> <td>M, W 9:30–10:30 am CSS2369</td> </tr> </tbody> </table>						Name	Email	Office hours	Megan Marshall	mmarsha7@umd.edu	W 1:00–3:00 pm PHY3101	Huong Vu	huongvu@umd.edu	M 1:00–3:00 pm PHY3103B	Tung-Chang Liu	tcliu@umd.edu	M, W 9:30–10:30 am CSS2369																													
Name	Email	Office hours																																													
Megan Marshall	mmarsha7@umd.edu	W 1:00–3:00 pm PHY3101																																													
Huong Vu	huongvu@umd.edu	M 1:00–3:00 pm PHY3103B																																													
Tung-Chang Liu	tcliu@umd.edu	M, W 9:30–10:30 am CSS2369																																													
COURSE WEBSITE AND COMMUNICATION	<p>Course documents, lecture slides, homework assignments and course communication will all be handled using ELMS Blackboard. Make sure you have access to the course site.</p> <p>Changes of schedule and other important course information will be posted on the course website and in the event of urgent information will be emailed to students.</p>																																														
TIMES AND LOCATIONS	<table border="0"> <thead> <tr> <th>Section</th> <th>Type</th> <th>Time</th> <th>Location</th> <th>Instructor</th> </tr> </thead> <tbody> <tr> <td>All</td> <td>Lecture</td> <td>MWF 11:00–11:50 am</td> <td>PHY 1410</td> <td>Dr Hertz</td> </tr> <tr> <td rowspan="2">0102</td> <td>Discussion</td> <td>M 3:00 pm–3:50pm</td> <td>PHY1204</td> <td rowspan="2">Megan Marshall</td> </tr> <tr> <td>Lab</td> <td>M 4:00 pm–5:50pm</td> <td>PHY 3314</td> </tr> <tr> <td rowspan="2">0103</td> <td>Discussion</td> <td>Tu 8:00am–8:50am</td> <td>PHY1219</td> <td rowspan="2">Huong Vu</td> </tr> <tr> <td>Lab</td> <td>Tu 9:00am–10:50am</td> <td>PHY 3314</td> </tr> <tr> <td rowspan="2">0104</td> <td>Discussion</td> <td>Tu 10:00am–10:50am</td> <td>PHY1204</td> <td rowspan="2">Megan Marshall</td> </tr> <tr> <td>Lab</td> <td>Tu 11:00am–12:50pm</td> <td>PHY 3314</td> </tr> <tr> <td rowspan="2">0105</td> <td>Discussion</td> <td>Tu 1:00pm–1:50pm</td> <td>PHY0405</td> <td rowspan="2">Tung-Chang Liu</td> </tr> <tr> <td>Lab</td> <td>Tu 2:00pm–3:50pm</td> <td>PHY 3314</td> </tr> </tbody> </table>	Section	Type	Time	Location	Instructor	All	Lecture	MWF 11:00–11:50 am	PHY 1410	Dr Hertz	0102	Discussion	M 3:00 pm–3:50pm	PHY1204	Megan Marshall	Lab	M 4:00 pm–5:50pm	PHY 3314	0103	Discussion	Tu 8:00am–8:50am	PHY1219	Huong Vu	Lab	Tu 9:00am–10:50am	PHY 3314	0104	Discussion	Tu 10:00am–10:50am	PHY1204	Megan Marshall	Lab	Tu 11:00am–12:50pm	PHY 3314	0105	Discussion	Tu 1:00pm–1:50pm	PHY0405	Tung-Chang Liu	Lab	Tu 2:00pm–3:50pm	PHY 3314				
Section	Type	Time	Location	Instructor																																											
All	Lecture	MWF 11:00–11:50 am	PHY 1410	Dr Hertz																																											
0102	Discussion	M 3:00 pm–3:50pm	PHY1204	Megan Marshall																																											
	Lab	M 4:00 pm–5:50pm	PHY 3314																																												
0103	Discussion	Tu 8:00am–8:50am	PHY1219	Huong Vu																																											
	Lab	Tu 9:00am–10:50am	PHY 3314																																												
0104	Discussion	Tu 10:00am–10:50am	PHY1204	Megan Marshall																																											
	Lab	Tu 11:00am–12:50pm	PHY 3314																																												
0105	Discussion	Tu 1:00pm–1:50pm	PHY0405	Tung-Chang Liu																																											
	Lab	Tu 2:00pm–3:50pm	PHY 3314																																												
REQUIRED MATERIALS	<ul style="list-style-type: none"> • Physics for Scientists and Engineers 4th Ed, by D. Giancoli (ISBN: 978-0131495081) • PHYS 141 Laboratory Manual, Fall 2004 edition • ResponseCard RF-LCD Clicker 																																														
LECTURES	<p>Students are <i>required</i> to attend lectures, where homework assignments will be collected, exams will be announced and administered, and the course material will be presented. During lectures, cell phones and other mobile devices may not be used.</p>																																														
CLICKERS/ PARTICIPATION	<p>Lectures will include a number of questions which you will be asked to answer using your clicker. Credit is assigned on whether or not you answer the question, not on what answer you choose. In other words, you still get credit if you guessed wrong. But if you don't answer at all, you get no credit.</p> <p>Participation will account for 5% of your final grade. For purposes of your participation grade, each of the 41 lectures (discounting the first lecture and in-class exams) will be worth an equal amount, regardless of the number of questions asked. You will receive full participation credit for a lecture provided you answer at least half of the questions (regardless of whether they are answered correctly or not). If you do not answer at least half the questions, you will not receive credit.</p> <p>You may miss four lectures without any penalty; beyond that every lecture missed will correspond to a loss of 1/37th of the 5% possible for participation.</p>																																														

HOMEWORK

Homework will be assigned weekly. Each assignment will be posted on the ELMS blackboard course website on Friday after the lecture and is due the following Friday at the beginning of lecture. Solutions will be posted after the lecture on the day the assignment is due.

The first homework assignment will be due on 9/9.

Cooperation and discussion between students regarding homework assignments is strongly encouraged. However, all work you hand in *must* be your own. Copying another student's homework is a violation of the University's code of academic integrity and will be dealt with accordingly (see below).

Homework solutions should be written out neatly on paper. Make sure that your homework is stapled together (do not use a paper clip) and that your name, section number and the name of your TA are all on every page in the top right corner.

Late homework will not be graded. Homework which is illegible will not be graded.

Each homework assignment as a whole will be graded on a scale of 0-5, with emphasis being on reasoning and comprehension of concepts.

There will be 10 homework assignments during the course. Of these, only the 8 best will be used for purposes of calculating your final grades (meaning that you can drop your two worst homework grades if you hand in all assignments).

QUIZZES

Quizzes will be conducted weekly in lecture, using clickers. These will take place on Wednesdays (following homework being due on Friday). The material in each quiz will be based on the homework due the previous Friday.

The first quiz will be on 9/14.

For the quizzes, you will be assigned partial credit (1 point) for answering a question incorrectly, and full credit (5 points) for answering it correctly. If you do not attend the lecture, or do not answer, you will receive 0 points. All quizzes will be weighed equally for purposes of determining your final grade, regardless of the number of questions on the quiz.

There will be 10 quizzes during the course. Of these, only the 8 best will be used for purposes of calculating your final grades (meaning that you can drop your two worst quiz grades if you complete all quizzes).

DISCUSSION SECTIONS

Discussion sections will be conducted by Teaching Assistants. They will involve interactive tutorials, problem solving help, addressing students' individual concerns and questions, and are an important part of the course. Graded homework and midterm exams will be returned during discussion section.

LAB

Lab sections will be conducted by a Teaching Assistant. Each student is *required* to attend his or her designated lab section each week and complete the assigned experiment. Students should read the lab description beforehand and take and analyze the data during class.

During the lab, you will carefully and neatly write your data on a sheet of paper. You will also write the answers to any questions in the lab on a sheet of paper. Before you leave the lab, you will show these sheets to your TA. The TA will then grade as follows: 10: made honest attempt to complete all work, 5: did not complete the required work.

Note that your TA *must* sign off on your work before you leave the lab. If you do not, you will not receive credit for the lab.

Make-up labs will be conducted the weeks of Oct 17th (for labs 1, 3, 2, 6, and 5) and Dec 5th (for labs 4, 7, 8, 9, 10). *Note that you can only make up one lab in each make-up session.* Do not plan on using the make-up session to do labs!

It is very important you attend and complete all labs. Students failing to complete all labs will lose a third of a letter grade on their final course grade for each missed lab.

EXAMS

There will be three 50-minute in-class exams on 10/3, 10/31 and 11/28 during the normally scheduled lecture and a one 2 Hr. Final exam (12/17, 8:00-10:00 am).

All exams are closed book and closed note exams.

Students will have access to a sheet containing important formulae and physical constants. The use of graphing calculators is not permitted for exams.

Of the three in-class exams, only your best two grades will be counted for the final grade.

FINAL GRADE The final grade will be based on the components with the following weights:

Portion	Contribution
Best two of three in-class exams	$2 \times 20\% = 40\%$
Final Exam	30%
Participation	5%
Quizzes (best 8)	10%
Homework (best 8)	10%
Labs*	5%
Total	100%

Note that every missed lab will result in the loss of a third of a letter grade for your total course grade.

STUDENTS WITH DISABILITIES Students with disabilities should meet with the instructor at the beginning of the semester so that appropriate arrangements can be made to accommodate the student's needs. I am more than happy to accommodate students with special needs but you need to inform me ahead of time so that I can arrange for the appropriate measures to be taken.

TUTORING The Physics Department has a free tutoring service, the Slawsky Clinic. It is located in Room 1214 in the Physics building. See <http://www.physics.umd.edu/academics/ugrad/slawsky.html>

UNIVERSITY CLOSURE In the event of a University Closure the department will do its best to accommodate students by scheduling make-up sessions or revision of the lab schedule.

ACADEMIC INTEGRITY I expect all students to comply with the University of Maryland's academic integrity policies, including the [code of academic integrity](#) and the [honor pledge](#). Any and all failures to comply will result in a failing grade and will be reported to the Honor Council.

Violations of the code include but are not limited to copying homework, using unauthorized materials during exams, copying another student's exam, and using another student's clicker in lecture.

ABSENCES AND MAKEUPS As a policy, there will be no make-ups for missed lectures, quizzes, homework assignments and exams because students are already permitted to drop their lowest two quiz and homework grades, their lowest four participation grades for lectures, as well as their lowest midterm. Similarly, lab make-ups will be permitted only as described above.

Make-ups beyond this built-in leeway will only be possible under extreme extenuating circumstances, generally limited to medical emergencies for which documentation must be produced, signed by a health care professional.

LAB SCHEDULE

Week	Dates:	Experiment	Experiment Title
2	Sep 05, 06	—	No Lab
3	Sep 12, 13	1	Errors and Significance of Data
4	Sep 19, 20	3	Equilibrium of Forces
5	Sep 26, 27	2	The Freely Falling Body
6	Oct 03, 04	6	Centripetal Forces and Acceleration
7	Oct 10, 11	5	Ballistic Pendulum
8	Oct 17, 18	1, 3, 2, 6, 5	Make-up Labs (Only 1 lab can be made up.)
9	Oct 24, 25	4	Two-dimensional Collisions
10	Oct 31, 01	7	Angular Momentum & its Conservation
11	Nov 07, 08	8	Simple Harmonic Motion & Hooke's Law
12	Nov 14, 15	9	The Pendulum
13	Nov 21, 22	10	Standing Waves on a String
14	Nov 28, 29	—	No Lab
15	Dec 05, 06	4, 7, 8, 9, 10	Make-up Labs (Only 1 lab can be made up.)

TENTATIVE LECTURE SCHEDULE (subject to change)

Week	Date	Day	Topic	Subtopics	Reading in Giancoli	HW	Quiz	Lab
1	8/31	W	Measurement	Course Introduction, Units, What is Physics?	1			No
	9/2	F	& Vectors	Vectors & Reference Frames	2.1, 3.1-3.5			Lab
2	9/5	M		<i>No class - Labor Day</i>				No
	9/7	W	Motion	Graphing Motion	2.2-2.4			Lab
	9/9	F		1-D motion, constant acceleration	2	1		
3	9/12	M		Projectiles	3.7, 3.8			1
	9/14	W	Forces	Interactions & Forces	4.1-4.5		1	
	9/16	F		Newton's Laws	4.1-4.5	2		
4	9/19	M		Weight & Free-body Diagrams	4.6-4.7			3
	9/21	W		Friction	5.1		2	
	9/23	F		Statics & Dynamics	5.1	3		
5	9/26	M		Circular Motion and its dynamics	5.2			2
	9/28	W		Gravity & weightlessness	6.1-6.2, 6.4		3	
	9/30	F	Energy	Work, Energy & Power	7.1-7.4			
6	10/3	M		<i>Midterm 1: Motion and Force</i>	2-6			6
	10/5	W		Potential Energy	8.1-8.2			
	10/7	F		Conservation of Energy	8.3-8.5	4		
7	10/10	M		Gravitational PE	8.7			5
	10/12	W	Momentum	Momentum (& conservation), impulse	9.1-9.3		4	
	10/14	F		Collisions	9.4-9.7	5		
8	10/17	M		Center of Mass	9.8, 9.9			Make
	10/19	W	Rotation	Angular Quantities	10.1-10.6		5	ups
	10/21	F		Rotational Energy & Inertia	10.7-10.9	6		
9	10/24	M		Angular Momentum & Rotational Dynamics	11.1-11.6			4
	10/26	W		Torque and static equilibrium	12.1, 12.2		6	
	10/28	F	Oscillations	Springs: Simple Harmonic Motion	14.1-, 4.2			
10	10/31	M		<i>Midterm 2: Energy, Momentum, Rotation</i>	7-12			7
	11/2	W		Energy in SHM & the Pendulum	14.4- 14.5			
	11/4	F	Waves	Waves: longitudinal & transverse, Energy	15.1-15.3	7		
11	11/7	M		Superposition, Interferences	15.4, 15.6-15.8			8
	11/9	W		Resonance, standing waves, sound	15.9, 16.1, 16.2		7	
	11/11	F		Sound, auditory system	16.3, 16.4	8		
12	11/14	M	Fluids	Density and pressure in fluids	13.1-13.6			9
	11/16	W		Buoyancy; Fluid Flow	13.7, 13.8		8	
	11/18	F		Bernoulli and Poiseuille Flow	13.9-13.12	9		
13	11/21	M	Thermal	Temperature, 0th Law	17.1-17.6			10
	11/23	W	Physics	Ideal Gas Law	17.8-17.9		9	
	11/25	F		No class - Thanksgiving Break				
14	11/28	M		<i>Midterm 3: Oscillations, Waves, Fluids</i>	13-16			No
	11/30	W		Internal Energy, specific heat	19.1-19.3			lab
	12/2	F		Calorimetry, Latent Heat, 1st Law	19.4-19.6	10		
15	12/5	M		Processes of ideal gasses	19.7-19.10			Make
	12/7	W		2nd Law, Heat Engines, Carnot Cycle	20.1-20.3		10	ups
	12/9	F		Refrigerators and Entropy	20.4-20.6			
16	12/12	M		Catch-up Lecture				
	12/14	W		Review (tentative)				
	12/17	S		<i>Final Exam 8:00-10:00am</i>				