

# Physics 122 – Fundamentals of Physics II

## Syllabus for Fall 2012

**Course description** The second of a two-semester series in general physics. The course is a continuation of PHYS 121, and covers waves, electricity and magnetism, optics, and modern physics. This survey course, together with PHYS 121, generally satisfies the minimum requirement of medical and dental schools.

**Pre-requisite** PHYS 121 or similar or comparable course, or permission of the department. Students are expected to be comfortable and proficient in algebra and trigonometry.

**Instructor** Prof. Ki Yong Kim  
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Institute for Research in Electronics and Applied Physics  
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**Office hours :** Mon 11-noon and Thu 3-4 pm, also w/ appointment

**Website** <http://elms.umd.edu>  
The syllabus and schedule can be also found at:  
<http://www.physics.umd.edu/courses/Phys122/index.html>

**Books**

- Knight, Jones, Field, *College Physics: A Strategic Approach*, 2nd edition
- PHYSICS 122 Laboratory Manual, Fall 2008 edition

Sections	Teaching Assistant	Time and place		
0201	Ugur Cetiner <a href="mailto:cetiner.ugur@gmail.com">cetiner.ugur@gmail.com</a> x2-5982	Lab	Wed, 11-12:50	PHY 3306
		Dis	Wed, 9-9:50	PHY 1219
		Office	Tue, Thu, 2-3	IPST 1102
0202	Ugur Cetiner <a href="mailto:cetiner.ugur@gmail.com">cetiner.ugur@gmail.com</a> x2-5982	Lab	Mon, 12-1:50	PHY 3306
		Dis	Mon, 10-10:50	PHY 0405
		Office	Tue, Thu, 2-3	IPST 1102
0203	Zachary Raines <a href="mailto:raineszm@gmail.com">raineszm@gmail.com</a> x5-5969	Lab	Thu, 9-10:50	PHY 3306
		Dis	Thu, 8-8:50	PHY 1219
		Office	Tue, Thu, 4-5	PHY 0220
0204	Zachary Raines <a href="mailto:raineszm@gmail.com">raineszm@gmail.com</a> x5-5969	Lab	Wed, 3-4:50	PHY 3306
		Dis	Wed, 2-2:50	PHY 0405
		Office	Tue, Thu, 4-5	PHY 0220
0205	David Somers <a href="mailto:dsomers214@gmail.com">dsomers214@gmail.com</a> x5-5982	Lab	Mon, 2-3:50	PHY 3306
		Dis	Wed, 1-1:50	MTH 0101
		Office	Tue, 11-noon	PHY 0220

**Lectures**      **Physics 1412, TuTh 12:30 pm – 1:45 pm**

Students are required to attend lectures, where the course material will be presented and homework assignments and exams will be announced, given and collected. Lectures will consist of presentation slides, chalkboard calculations, live demonstrations and student participation. Note that not all material will be directly covered in lectures. Students are responsible for reading and understanding all material in assigned chapters, whether or not this material is explicitly treated in the lectures.

**Lab**      You are required to complete a total of 10 laboratory assignments. Each week you will do the designated laboratory exercise, coordinated by your Teaching Assistant, and complete the assigned experiment. You should read the lab description beforehand. **For each lab, you must give your TA a completed “check sheet” and written answers to the questions at the end of the laboratory write-up.** Your lab grade will be based on these questions (maximum 20 points, equally divided into the number of questions). The TA will deduct points if your handwriting is illegible, or if your answer is hard to understand. If you cannot attend a session for an excusable reason, you may attend another section given the same week **with the permission of the Instructor**. Or you may attend a scheduled makeup session. In general, it will only be possible to perform a single experiment during the makeup session.

**Discussion sections**      Discussion sections will be conducted by Teaching Assistants, and are a forum where students can ask questions about the course material and where problems will be worked with student participation.

**Homework**      MasteringPhysics homework assignments will be given and posted on ELMS.

**MasteringPhysics:** MasteringPhysics is an online tutorial and homework which accompanies the textbook. To access Mastering Physics you need an access code. If you get the textbook from the Bookstore, it should come bundled with a “Student Access Kit”. If you bought a version of the textbook that didn’t come with an Access Kit, you can purchase an access code directly from the web site at [www.masteringphysics.com](http://www.masteringphysics.com). If you expect to purchase the textbook from the bookstore, you should not purchase an access code from the web site because then you will end up paying twice for MasteringPhysics.

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**Homework policy:** Late homework is accepted only in exceptional circumstances (i.e. illness, a religious observance, or some other compelling reason). If you do not have a valid excuse, you can still turn in late homework with penalty.

**Exams**      There will be **three** mid-term exams and **one** final exam. All exams are closed

book. You will need a regular calculator with standard trigonometry functions. The exam sheets will contain any numerical constants that you will need. Exams must be taken on the scheduled days unless you have a valid excuse. Make-up exams will be given only under extraordinary circumstances if arrangements are made with the instructor ahead of time.

## Grade

The final grade will be based on the components below.

Homework	25%
Lab	20%
Mid-term exams* (best 2 out of 3)	30%
Final exam	20%
Participation**	5%

\* The best two out of three mid-term exams will be used for the final grade *if and only if* all three are completed.

\*\* It includes class participation, clicker questions, tutorial attendance, and survey participation.

The final grade will be set at the end of the semester after all work is completed. The final grade will be determined by the University of Maryland grading policy, quoted below:

- A** excellent mastery of the subject and outstanding scholarship.
- B** good mastery of the subject and good scholarship.
- C** acceptable mastery of the subject and the usual achievement expected.
- D** borderline understanding of the subject. It denotes marginal performance, and it does not represent satisfactory progress toward a degree.
- F** failure to understand the subject and unsatisfactory performance.

## Tutoring and Help

Your instructor and TA have office hours, both scheduled and by appointment, and are happy to help you outside of class. Don't be shy! We really are happy to work with you!

In addition, the Physics Department has a free tutoring service, the Slawsky Clinic, run by a nice group of senior physicists. It is located in Room 1214 in the Physics building. The time reserved for PHYS 142 is 10-11 am (MWF), 12-1 pm (TuTh), and 2-3 pm (Monday through Friday). However, you can usually get help at any time they are open, from 10 am until 3 pm. More information can be found at:

<http://umdphysics.umd.edu/academics/tutoring-a-academic-support/93-slawskyclinic.html>

## Course

Your participation in the evaluation of courses through CourseEvalUM is a

<b>Evaluation</b>	responsibility you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University as well as to the tenure and promotion process. You can go to the CourseEvalUM website ( <a href="http://www.courseevalum.umd.edu">www.courseevalum.umd.edu</a> ) to evaluate the course.
<b>University Closure</b>	In the event of a University Closure the department will do its best to accommodate students by scheduling make-up sessions.
<b>Students with disabilities</b>	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.
<b>Academic Integrity</b>	You must work by yourself on exams and homework. You are allowed to work with other students, your TA and your instructor on your homework. However, you should not just directly copy from them. Doing so is not only dishonest, but will hurt your ability to do the problems on the exams.

**Lecture/Exam Schedule: Physics 1412, TuTh 12:30 pm – 1:45 pm**

(subject to change as the semester progresses)

<b>Week</b>	<b>Dates</b>	<b>Topic</b>	<b>Chapter in Text</b>
1	Aug 30	Introduction; Oscillations	Chapter 14
2	Sep 4, 6	Traveling waves and sound	Chapter 14, 15
3	Sep 11, 13	Superposition and standing waves	Chapter 16, 20
4	Sep 18, 20	Electric fields and forces	Chapter 20, 21
5	Sep 25, 27	Electric potential	Chapter 21, 22
6	Oct 2	Current and resistance; Review 1	Chapter 22
	Oct 4	<b>Exam 1</b>	<b>Cumulative</b>
7	Oct 9, 11	Circuits	Chapter 23
8	Oct 16, 18	Magnetic fields and forces	Chapter 24
9	Oct 23, 25	EM induction and EM waves	Chapter 25
10	Oct 30	AC electricity; Review 2	Chapter 26
	Nov 1	<b>Exam 2</b>	<b>Cumulative</b>
11	Nov 6, 8	Ray optics	Chapter 18
12	Nov 13, 15	Wave optics	Chapter 17
13	Nov 20	Optical instruments	Chapter 19
	Nov 22	<i>Thanksgiving Holiday</i>	<b>No Lecture</b>
14	Nov 27	Quantum physics; Review 3	Chapter 28
	Nov 29	<b>Exam 3</b>	<b>Cumulative</b>
15	Dec 4, 6	Relativity	Chapter 28, 27
16	Dec 11	Review for final exam	Review
	Dec 18, 1:30 (Testudo)	<b>Final Exam</b>	<b>Cumulative</b>

**Lab Schedule: Rm. 3306**

**0201 (W, 11-12:50 pm), 0202 (M, 12-1:50 pm), 0203 (Th, 9-10:50 am), 0204 (W, 3-4:50 pm), 0205 (M, 2-3:50 pm)**

Week	Dates	Experiment #	Experiment Title
1	Aug 29-30	No Lab	<i>No lab this week</i>
2	Sep 3-6	No Lab	<i>No lab this week</i>
3	Sep 10-13	1	Standing waves on a vibrating string
4	Sep 17-20	2	The digital oscilloscope
5	Sep 24-27	3	Equipotential surfaces
6	Oct 1-4	4	Electrical resistance
7	Oct 8-11	1-4	<b>Make up</b>
8	Oct 15-18	6	Charge-to-Mass ratio of an Electron
9	Oct 22-25	5	Magnetic force between currents
10	Oct 29-Nov 1	7	Electromagnetic induction
11	Nov 5-8	8	Ray Optics
12	Nov 12-15	9	Double slit interference
13	Nov 19-22	No Lab	<i>Thanksgiving Holiday</i>
14	Nov 26-29	10	The photoelectric effect
15	Dec 3-6	5-10	<b>Make up</b>

### Class Schedule

	Mon	Tue	Wed	Thu
8				Dis (0203), 1219
9			Dis (0201) 1219	Lab (0203) PHY 3306
10	Dis (0202) PHY 0405			
11	Office (all) ERF 1202J, Kim	Office (0205) PHY 0220, Somers	Lab (0201) PHY 3306	
12	Lab (0202) PHY 3306	Lec PHY 1412		Dis (0205), M0101
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2	Lab (0205) PHY 3306	Office (0201, 0202) IPST 1102, Cetiner	Dis (0204), 0405	Office (0201, 0202) IPST 1102, Cetiner
3			Lab (0204) PHY 3306	Office (all) ERF 1202J, Kim
4		Office (0203, 0204) PHY 0220, Raines		Office (0203, 0204) PHY 0220, Raines
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