Physics 140 (General Physics II)
Spring 2013
Dr. Pfeil

Course Meeting Time and Place

PHY140-01: MWF: 12:00 pm – 12:50 pm, Merion 112

Course Description:

Physics 140 is a continuation of Physics 130, which covers electricity, magnetism, electrical circuits, optics and quantum physics. These topics, in addition to being fundamental underpinnings of modern technology, are required to understand the function and biochemistry of cells. PHY140 is primarily a service course for biology and pre-health professionals, so I will be emphasizing biological applications wherever possible.

Specific Learning Outcomes:

Our goals are:

- An ability to think critically and analytically.
- An ability to use words, equations, and graphs to communicate effectively in a technical setting.
- An ability to apply reductionist problem solving techniques.
- An ability to employ quantitative concepts and mathematical models.
- Mastery of course material.

Required Course Materials:

- *Physics* by Cutnell and Johnson, 9th ed. Wiley.
- WileyPlus access code for *Physics* 9th ed.
- Physics 140 lab manual handouts (provided on D2L).
- Laboratory Notebook (BookFactory, as sold by University Bookstore)

Contact Information:

- email: spfeil@wcupa.edu (please include lecture section e.g. PHY140-01 in the subject line.)
- office: Schmucker Science South 229 (please note this is not in Merion)
- phone: (610) 430-4084

Office Hours:

My scheduled office hours as of the first day of class are listed below. I reserve the right to adjust this schedule to reflect unforeseen circumstances, but any adjustment will be posted in advance on D2L.

Monday	Thursday	Friday
2 pm-3 pm ☐	8 am – 11 am ☐	1 pm – 2 pm ☐

Please check-off which office hours you can attend.

Course Schedule:

NOTE: Because of contract negotiations between state administrators and APSCUF (the faculty union), the class schedule for this course is tentative, and is subject to revision in the case of a strike. Your professor will not be teaching the course during a strike, including lectures, meetings with students, assigning or grading work, or submitting mid-term or final grades. During a strike, faculty will not be able to receive email through the university server.

Date	Lecture	Reading	Lab	Demo
01/28/13	Introduction, Electric Charge, Charging contact and Induction	18.1-18.4		Charging by contact and induction.
01/30/13	Coulomb's Law, Electric Fields	18.5-18.7	No Lab	
02/01/13	Electric Fields, Gauss' Law Quiz-0	18.8-18.9,18.11		
02/03/13	**Homework #1 (reminder)**	18		
02/04/13	Electric Potential Energy	19.1-19.3		
02/06/13	Capacitors and Dielectrics	19.4-19.5	Electric Charge	
02/08/13	EPE Problems and Applications Quiz-1	19.6		
02/10/13	**Homework #1 and #2 Due**	18, 19		
02/11/13	Ohm's Law	20.1-20.4		Plinko Board
02/13/13	DC Circuits I	20.6-20.7	Ohm's Law	Light bulbs in series and parallel
02/15/13	DC Circuits II Quiz-2	20.8-20.10		
02/17/13	**Homework #3 Due**	20		
02/18/13	DC Circuits III	20.12-20.14	Resistors in Series and Parallel	
02/20/13	Catch Up Day (Review if time allows)			
02/22/13	Magnetic Force Quiz-3	21.1-21.2, 21.5		

02/24/13	**Homework #4 Due**	20		
02/25/13	Magnetic Force II	21.3-21.4, 21.6	Equivalent Resistance	
02/27/13	Production of Magnetic Fields	21.7-21.9		
03/01/13	**Exam #1**	18-20		B-Field from a wire.
03/03/13	**Homework #5 Reminder**	21		
03/04/13	EMF and Flux	22.1-22.3	RC Circuits	
03/06/13	Faraday and Lenz Laws	22.4-22.5		Magnet drop.
03/08/13	Generators and Transformers Quiz-4	22.8-22.10	**(Lab report #1 Due)**	
03/10/13	**Homework #5 and #6 Due**	21,22		
03/11/13	AC Circuits: Phasors	23.1-23.3	Inductors	
03/13/13	AC Circuits: Reactance and Power	23.3-23.4		Ring Jump.
03/15/13	AC Circuits: R, C, and L Quiz-5	Examples		
03/17/13	**Homework #7 Due**			
03/18-03/22	**Spring**	**Break**	**No**	**Class**
03/25/13	EM Waves	24.1-24.5	TBA	
03/27/13	EM Waves	24.5-24.6		Polarizers
03/29/13	Reflection of Light	25.1-25.3		
03/30/13	**Homework #8 Due**	24		
04/1/13	**Exam #2**	21-24	Basic Optics	
04/3/13	Spherical Mirrors	25.4-25.5		Blackboard Optics
04/5/13	Mirror Equation and Applications	25.6		
04/07/13	**Homework #9 Due**	25		
04/8/13	Snell's law, TIRF, Dispersion	26.1-26.4	Lenses **(Lab Report #2 Due)**	
04/10/13	Lenses	26.6-26.8		Blackboard Optics
04/12/13	Lens Combinations, The Eye Quiz-6	26.9-26.10		
04/14/13	**Homework #9 and #10 Due**	25,26		
04/15/13	Diffraction	27.1-27.2	Optical Instruments	
04/17/13	Interference	27.3-27.5		
04/19/13	Thin Film Interference Quiz-7	27.6-27.7		Diffraction Grating
04/21/13	**Homework #11 Due**	27		
04/22/13	Quantum Physics I	29.1-29.3	Interference	
04/24/13	Quantum Physics II	29.5-29.7		Electron Diffraction
04/26/13	**Exam #3**	24-27		

04/28/13	**Homework #12 Reminder**	29		
04/29/13	Atomic Physics: Bohr Model	30.1-30.3	Diffraction	
05/01/13	Atomic Physics: Modern Picture	30.5-30.7		
05/03/13	Applications and Fluorescence Quiz-8			
05/05/13	**Homework #12 and #13 Due**	29,30		
05/06/13	Nuclear Physics	31.1-31.4		
05/08/13	Nuclear Physics	31.5-31.31.9	**Lab Report #3 Due**	
05/10/13	catch up or review			
05/15/13	**FINAL EXAM: 1-3p, Merion 112**			

Homework Assignments (On WileyPlus)

HW	Problems
1	CH18: 3, 8, 19, 21, 30, 33, 49, 54, 59
2	CH19: FC2, FC12, 3, 17, 33, 42, 49, 57, 61
3	CH20: FC1, FC2, 5, 11, 14, 22, 52, 65,
4	CH20: 79, 97, 103, 105
5	CH21: FC3, 6, 35, 13, 21, 48, 52, 55, 59
6	CH22: 15, 18, 19, 21, 22, 34, 42, 54, 61
7	CH23: FC2, FC3,FC8, FC9, FC15, 3, 22
8	CH24: 3, 8, 17, 24, 30, 35, 36, 39, 42, 52
9	CH25: 3, 4, 39, 14, 17, 23
10	CH26: 2, 10, 26, 28, 46, 54, 56, 65, 75, 76
11	CH27: 1, 8, 12, 28, 35, 34, 43, 49
12	CH29: 1, 3, 9, 29, 30, 37, 38, 40
13	CH30: 1, 7, 11, 26, 35, 37, 41

Assessment:

I will be using the D2L grade-book feature to post course grades. Please check it periodically. The course has the following assessed components:

- **Laboratory** (15%): Laboratory notebooks will be graded on completeness and accuracy. All labs will be briefly assessed to verify completeness. A subset, approximately every third lab, will be chosen for detailed grading and feedback.
- **Homework** (15%): All homework assignments for the semester are posted on WileyPlus. **No late homework** will be accepted. The assigned homework is the *minimum* amount of practice a highly gifted student would need. I highly suggest doing more, as many as possible, practice problems. Please note the textbook has answers for all of the odd problems. I reserve the right to modify the homework assignments listed below to account for unforeseen circumstances.

- **Regular Exams** (45%, 3 @ 15% ea.): Regular exams are cumulative, since Physics as a subject is inherently cumulative, but will be strongly focused on the material listed on the course outline. For example, one may be required to use concepts from electrostatics (the first exam) on a problem on the second exam, but only in an incidental fashion.
- **Quizzes:** (5%): multiple choice quizzes on the material just covered. The first quiz, Quiz-0, will be scored but not recorded.

If you miss a regular exam (or quiz): If you miss an exam for a **University Sanctioned Event** you must notify me in advance so that we can arrange for you to take the exam in a manner consistent with its integrity. You must also provide some form of documentation (performing arts program, competition schedule etc.). If you miss for any other reason the same rules apply, and it must be a very good reason (Sickness, death, and dismemberment qualify.)

- **Final Exam** (20%): A cumulative final focusing on synthesis. In addition to problems similar to the midterm you will be asked to combine concepts from different parts of the course.

I will be using the official WCU scale for grades, see p.48 in the undergraduate catalog. However, I reserve the right to adjust the weights of individual components, or the scale to account for unforeseen circumstances.

Electronic Device Policy:

The pace of the course is such that your undivided attention will be required for the entire lecture and lab period. Please set all electronics to silent or "vibrate mode" and put them away. Both you and your neighbors will be able to concentrate on the material at hand.

D2L/WileyPlus:

We will be using two online platforms for this course WileyPlus, the publisher's homework system, and D2L. Homework assignments are to be performed on WileyPlus. I will post lecture slides, without solutions to example problems and etc. to D2L. Because I am continually refining my lecture presentations final versions will be posted *after* lecture. I will make a good faith effort to post draft versions prior to the lecture, *but these may have substantial revisions.* All lab manuals will be posted on D2L. As the author of these materials I give you *the student* permission to store and print a copy of all materials authored by me for your personal use during this semester. However, you may not repost them or make them available in any form to students not currently enrolled in this course. **Please see intellectual property statement.**

Attendance:

Lecture attendance while not formally required is strongly suggested. Students are responsible for any material covered in their absence. Attendance is required in the lab, please see the lab syllabus.

Disability Statement:

If you have a disability which will require special accommodation, please meet with me as soon as possible to discuss your needs. Also, contact the Office of Students with Disabilities (OSD) at (610) 436-2564. Both WCU and I desire to comply with the ADA of 1990.

University Sanctioned Events:

If you will be participating in a University sanctioned event during class or an exam **you must notify me in advance.** Please see the discussion of University Sanctioned Events in the general catalog.

Physics Tutoring:

Physics tutoring is available through LARC (610) 436-2535. In the past peer tutoring has also been available from SPS (the Society of Physics Students). If SPS tutoring becomes available this semester I will make an announcement. **These should be considered in addition to my office hours, which are the first place you should stop for additional help.**

Intellectual Property Statement:

I, the instructor, utilize copyrighted materials under the "Freedom and Innovation Revitalizing the United States Entrepreneurship Act of 2007" (Fair Use Act). Apart from such copyrighted materials, all other intellectual property associated with this course is owned and copyrighted by the instructor, including, but not limited to, lectures, course discussions, course notes, slides, assessment instruments such as exams, and supplementary materials posted or provided to students authored by the instructor. No recording, copying, storage in a retrieval system, or dissemination in any form by any means of the intellectual property of the instructor, in whole or in part, is permitted without prior written permission of the instructor. When such permission is granted, it must specify the utilization of the intellectual property and all such permissions and waivers shall terminate on the last day of finals of the semester in which this course is held.

ACADEMIC INTEGRITY & CONDUCT

I have a zero tolerance policy for breaches of academic integrity. Breaches of academic integrity will be investigated and sanctions imposed to the full extent available under University policy. For questions regarding the university Academic Dishonesty, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to their major department's handbook, the Undergraduate Course Catalogue, the Rams Eye View, or the University Web Site. Please understand that improper conduct in any of these areas will not be tolerated and may result in immediate ejection from the class.

PUBLIC SAFETY

The Emergency Communications Committee recommends that the number of WCU's Department of public safety be available on every course syllabi. WCU Department of Public Safety: (610) 436-3311.