General Physics II PHY140-03

Fall 2016

COURSE MEETING TIME AND PLACE:

Course Section	Meeting Time	Location
140-03	MoWeFri 10:00-10:50 am	Merion 113

Please see the lab and recitation syllabus addendums for meeting times.

INSTRUCTOR INFORMATION:

Dr. Shawn H. Pfeil
e-mail: spfeil@wcupa.edu (Please include section number on subject line.)
phone: (610) 430-4084
office: Schmucker Science South 229

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. Please note homework assignments are due Friday evenings.

Monday	Tuesday	Wednesday	Friday
11 am - 12 pm	10 am – 11 am	11 am – 12 pm	12 pm – 2 pm

Office hours are available by appointment for students with an ongoing conflict with my scheduled hours.

REQUIRED COURSE MATERIALS:

- *Physics* by Cutnell and Johnson, 10th ed. Wiley **including** WileyPlus access code for *Physics* 10th ed. – You may use your login credentials from PHY130.
- *West Chester Department of Physics 140 Fall 2016 Laboratory* Manual by Mathew M Waite and Anil Kandalam et al.
- Laboratory Notebook (BookFactory) – You may use your lab notebook from PHY130.

COURSE DESCRIPTION:

PHY140 is an extension of PHY 130. We will cover electricity and magnetism, geometrical and physical optics, and select topics in modern physics.

Additional Notes:

A laboratory portion of this course will provide hands-on experience with these phenomena and give a glimpse into how scientists discovered the physical laws covered in the lecture.

Prerequisite: Physics 130

WEST CHESTER UNIVERSITY GENERAL EDUCATION LEARNING OUTCOMES:

This course (PHY140) is an approved general education course in the Sciences (see pg. 39 of the undergraduate catalog) and as such meets the following general education goals:

***General Education Goal #2: Ability to employ quantitative concepts and mathematical methods*.** **(Secondary Goal of Science General Education Courses)**

Students will apply quantitative and mathematical methods to solve problems from introductory electromagnetism and modern physics.

Virtually every topic discussed in the class will have a quantitative aspect that will require algebraic reasoning. These methods will be employed during class examples, midterm exams, and laboratory sessions.

General Education Goal #3: Ability to think critically and analytically. **(Primary Goal of Science General Education Courses)**

Students will analyze physical situations and identify what aspects are fundamental to physical modeling.

Electromagnetism and modern physics, the primary subject matter of this course, involve the complex interplay of such concepts as electric fields, magnetic fields, and energy. Critical and analytical thinking are essential for applying these concepts to efficiently solve homework and exam problems. One of the many examples might be making assumptions and inferences necessary to analyze the operation of a mass-spectroscopy system.

ADDITIONAL COURSE SPECIFIC STUDENT LEARNING OBJECTIVES:

1. Students will demonstrate an ability to analyze problems involving electrical forces and fields.
2. Students will synthesize the new concepts of electrical potential energy and electric potential (voltage) with their knowledge and understanding of mechanical energy.
3. Students will demonstrate an ability to both categorize and analyze electrical circuits.
4. Students will demonstrate an ability to analyze problems involving magnetic forces and fields.
5. Students will demonstrate an ability to synthesize magnetic forces with their understanding of uniform circular motion.
6. Students will demonstrate an ability to summarize and interpret Faraday's and Lenz's laws.
7. Students will demonstrate an ability to synthesize the electromagnetic wave description of light with their understanding of mechanical waves.
8. Students will demonstrate an ability to analyze problems from geometric optics involving thin lenses and mirrors.
9. Students will demonstrate an ability to synthesize their understanding of mechanical wave interference with interference of electromagnetic waves.
10. Students will demonstrate an ability to analyze problems using the uncertainty principle.

TIME COMMITMENT AND WORK FLOW:

The life of a college student is not easy. A full time student can expect to spend about 50 hrs per week on coursework, or about 12.5 hrs per week per course. Here is how I recommend you spend your 12.5 hours for Physics 140. (Please note some students may need more than 12.5 hrs/week to master the material.)

Activity	Time Commitment
Reading Prior to Class	1.5 hrs/week
Class	2.5 hrs/week
Post Lecture Study	1.5 hrs/week
Homework After Lecture	3.75 hrs/week
Reading Prior to Lab	0.25 hrs/ week
In Lab Time	2 hrs/week
Post Lab Write-Up	1 hrs/week
Total Time Spent	12.5 hrs/week

ASSESSMENT:

I will be using the D2L grade-book feature to post course grades. Please check it periodically.

- **Laboratory** (15%): Please see laboratory syllabus for details.
- **Homework** (15%): Every lecture has two homework assignments. One assignment is for credit. The other assignment, which wills be clearly labeled "practice" is not for credit. This assignment is for additional practice. All of the assignments from the previous week are due at 11 pm on **Fridays**. **All assignments have a clearly labeled due date on WileyPlus. It is your responsibility to check WileyPlus periodically.** Please also see the homework due date column on the class schedule.

  Solutions to all homework problems are available on WileyPlus immediately after the assignment is due. Because solutions are available immediately, late homework will not be considered. In addition to the Solutions provided by WileyPlus supplemental homework solutions may be provided to problems of particular interest. These solutions will be posted on D2L.

- **Regular Exams** (45%): Four regular exams will be given during the semester. I will keep your highest three scores.
  - **If you miss a regular exam :** 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.) In all other cases a missed exam will be treated as your dropped exam.
  - **If you have an OSD letter pertaining to exams:** You are responsible for making the appropriate arrangements **prior** to the exam date and time.

- **Final Exam** (25%): The final is cumulative and will require synthesis of concepts from different parts of the course.

The dates and times of the final exams for this course (as set by the registrar) are listed below. **You should plan to be available for the entire finals week.** We have in past semesters had to reschedule finals due to weather related events.

Final Exam Time and Location: Merion 113, Wednesday 12/14, 10:30 am- 12:30 pm

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.

The WCU grade scale is:

Letter	Grade Points	Percentage	
A	4.000	93 - 100	Excellent
A-	3.670	90 - 92	
B+	3.330	87 - 89	Superior
B	3.000	83 - 86	
B-	2.670	80 - 82	
C+	2.330	77 - 79	Average
C	2.000	73 - 76	
C-	1.670	70 - 72	
D+	1.330	67 - 69	Below Average
D	1.000	63 - 66	
D-	0.670	60 - 62	
F	0.000	59 or lower	Failure

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. ***If you plan on recording any lecture please see the intellectual property statement.***

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. To allow for *structured note taking* I will post my lecture slides prior to class. These slides intentionally leave some information, such as example solutions out, and provide space to fill that material in during lecture. **It is your responsibility to check these resources periodically for any updates and announcements. You may want to set D2L to notify you when new content is posted.**

The WileyPlus Course ID for our section is 528450

ATTENDANCE POLICY:

Attendance is taken is taken for this course. Attending lecture, while highly correlated with success in this course is not graded.

ACADEMIC & PERSONAL INTEGRITY

It is the responsibility of each student to adhere to the university's standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another's work and/or using ideas of another and presenting them as one's own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to the Department Undergraduate Handbook, the Undergraduate Catalog, the *Ram's Eye View*, and the University website at www.wcupa.edu.

STUDENTS WITH DISABILITIES

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University's Services for Students with Disabilities (OSSD), please visit them at 223 Lawrence Center. The OSSD hours of Operation are Monday – Friday, 8:30 a.m. – 4:30 p.m. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is ossd@wcupa.edu, and their website is at www.wcupa.edu/ussss/ossd.

EXCUSED ABSENCES POLICY FOR UNIVERSITY-SANCTIONED EVENTS

Students are advised to carefully read and comply with the excused absences policy for university-sanctioned events contained in the WCU Undergraduate Catalog. In particular, please note that the "responsibility for meeting academic requirements rests with the student," that this policy does not excuse students from completing required academic work, and that professors can require a "fair alternative" to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

REPORTING INCIDENTS OF SEXUAL VIOLENCE

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator, Ms. Lynn Klingensmith. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at the webpage for the Office of Social Equity at http://www.wcupa.edu/_admin/social.equity/.

EMERGENCY PREPAREDNESS

All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.

ELECTRONIC MAIL POLICY

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.

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.

ALL OTHER ACADEMIC POLICIES

For any university wide academic policy not explicitly covered in this document, such as No Grade policies. Please consult your major advising handbook, the Undergraduate Catalog, the Ram’s Eye View, or the University Website.

COURSE SCHEDULE: (next page): A tentative schedule for the course follows on the next page. Although I will endeavor to stick closely to the schedule as posted below, I reserve the right to modify it as needed over the course of the semester. Please note that if the University is closed (due to snow etc.) for a regularly scheduled lab session we will use one of the weeks marked “No Lab” to make up the canceled lab sections.

Date (mm/dd)	Day	#	Topic	HW	Reading	Lab
08/29	M	1	Charge Model		18.1-18.3	Introduction
08/31	W	2	Forces Between Charges - Coulomb's Law		18.4-18.5	
09/02	F	3	The Electric Field I		18.6-18.7	
09/05	M		**LABOR DAY NO CLASS**			**NO LAB**
09/07	W	4	The Electric Field II – Field Lines and Conductors		18.7-18.8	
09/09	F	5	The Electric Field III – Flux and Gauss' Law	1-4 Due	18.8-18.9	
09/12	M	6	Electrical Potential Energy		19.1-19.3	Electron Charge
09/14	W	7	Voltage and Energy of a Arrangement of Charges		19.3-19.4	
09/16	F	8	Capacitance and Dielectrics	5-7 Due	19.5	
09/19	M	9	Energy in Electric Fields, E-field Review		19.5-19.6	Mapping of Equipotentials
09/21	W	10	Circuits I: Current, Ohm's Law, Power		20.1-20.2, 20.4	
09/23	F	11	Circuits II: Resistor Circuits	8-9 Due	20.6-20.8	
09/26	M	X	**Exam 1: Chapters 18 & 19**			Resistors and Ohms Law (Lab report 1)
09/28	W	12	Circuits III: Loop Rules		20.8,20.10	
09/30	F	13	Circuits IV: RC Circuits	10-12 Due	20.12-20.13	
10/03	M	14	Magnetic Fields & Magnetic Force		21.1-21.2	Resistors in Series
10/05	W	15	Applications of Magnetic Force		21.2-21.4	
10/07	F	16	Force on a Wire and Motors	13-15 Due	21.5-21.6	
10/10	M		**FALL BREAK NO CLASS**			**NO Lab**
10/12	W	17	Production of Magnetic Fields		21.7-21.9	
10/14	F	18	Motional EMF & Magnetic Flux	16-17 Due	22.1-22.3	
10/17	M	X	**Exam 2: Chapters 20, 21**		22.4-22.5	Resistors in Parallel
10/19	W	19	Faraday's Law			(Turn in Lab Report 1)
10/21	F	20	Inductance and Energy Storage	18-19 Due	22.8-22.9	
10/24	M	21	Electromagnetic Waves		24.1-24.3	RC Circuits
10/26	W	22	Energy carried by EM waves		24.4-24.5	
10/28	F	23	Polarization and Doppler Effect	20-22 Due	24.5-24.6	
10/31	M	24	Light Rays, and Plane Mirrors		25.1-25.3	**NO LAB**
11/02	W	25	Spherical Mirrors and The Mirror Equation		25.4-25.6	
11/04	F	26	Index of Refraction and Snell's Law	23-25 Due	26.1-26.2	
11/07	M	X	**Exam 3: Chapters 22, 24**			EM Induction
11/09	W	27	Total internal reflection, Dispersion		26.3,26.5	
11/11	F	28	Thin lenses I & Ray Tracing Workshop[a]	26-27 Due	26.6-26.7	
11/14	M	29	Lenses and the Thin Lens Equation		26.9-10	Snell's Law
11/16	W	30	Lenses in Combination and the Eye		26.9-26.10	
11/18	F	31	Superposition and Young's Double Slit	28-30 Due	27.1-27.2	
11/21	M	32	The diffraction grating		27.5,27.7	Thin Lenses (Lab Report 2)
11/23	W		**THANKSGIVING BREAK**			
11/25	F		**THANKSGIVING BREAK**			
11/28	M	33	Resolving Power		27.6-27.7	**NO LAB**
11/30	W	34	Photons, the Photoelectric Effect/Sunburn		29.1-29.3	
12/02	F	35	Light Momentum, DeBroglie Relations	31-34 Due	29.4-29.5	
12/05	M		**Exam 4: Chapter 25, 26 and 27**			Interference and Diffraction
12/07	W	36	Matter Waves and The Uncertainty Principle		29.5-29.6	**(Turn in Report 2)**
12/09	F	37	The Bohr Model of the Atom/Nuclear Physics	35-36 Due	30.1-30.4	
12/12	M	38	Catch-up/review	37 Due		**NO LAB**