

West Chester University

Physics 100-08: Elements of Physical Science Fall 2016

COURSE OVERVIEW:

The goal of PHY 100 is to understand the basic concepts of physics and their application to our everyday lives. We will begin by discussing Physics, and science in general, as a technique for building a *predictive* conceptual model of the world. We will consider how putting these models into mathematical language allow us to ask quantitative questions of the natural world. Building on this foundation we will study modern theories of motion. In particular, we will investigate how and why things move and rotate. We will move on from this to studying waves and vibrations, which will allow us to understand how sound is made by musical instruments and develop a partial understanding of hearing. Most importantly, we will use each topic in the course to build a toolbox of analytical reasoning and problem solving skills that are widely applicable to modern life.

COURSE CREDIT: This 3 credit course is an approved course in the WCU General Education program.

COURSE REQUIREMENTS: This course has no formal prerequisites. However, we will be doing some algebra at the high school level. (I will work under the assumption that you have done this kind of math before, but perhaps not recently.) A good deal of time in this class will be spent extending our existing body of knowledge to new situations in order to understand them; I will assume that you have experience doing this.

MEETING TIMES:

MoWeFri: 9:00-9:50 am, Merion 109

REQUIRED COURSE MATERIALS:

- Physics: A Conceptual World View, 7th Ed., by Kirkpatrick & Francis (Thompson, Text: Brookes/Cole, 2009 or 2010)
- A stand-alone calculator which is *not* part of an internet-accessible personal electronic device.

INSTRUCTOR INFORMATION:

Dr. Shawn H. Pfeil

office: Schmucker South 229

office hours:

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

... and by appointment

email: spfeil@wcupa.edu

office phone: (610) 430-4084

webpage: This course has a D2L webpage. Homeworks, this syllabus, and all other related course materials will be posted to this webpage.

Please let me know if you are unable to access it. Being able to access the D2L website will be critical to student success in this course.

COURSE GENERAL EDUCATION GOALS: PHY 100 is an approved General Education course in the Sciences. As such, it is designed to help students meet the following general education goals:

Goal #2: Employ quantitative concepts and mathematical methods

This goal will be accomplished through in-class activities and practice problems discussed in lecture, and assigned homework problems.

Goal #3 Think critically and analytically

This goal will be accomplished through in-class activities as well as assigned homework problems.

Grading: Class participation: 15%

Homework Quizzes: 20%

Exams: 45%

Cumulative Final Exam: 20%

CLASS PARTICIPATION AND ATTENDANCE

Discussion and interactions with your peers are a critical aspect of the course. During each class you will be given opportunities to work through problems either individually or in small groups. Your participation grade will be based on responding to in class polling questions, and participating in discussions when called upon. Although participation is significantly more than attendance, **attendance during the entire class period is mandatory**. However, I do understand that unforeseen circumstances outside of your control might keep you from attending class; therefore you may miss class up to 5 times during non-exam days without penalty. Any additional unexcused absences will result in ZERO class participation points for that day. If you miss class due to an excused absence, it is **IT IS YOUR RESPONSIBILITY** to contact me by email to arrange a way to make up the class participation points that you missed. Excused absences are limited to University-Sanctioned Events (which follow the [Excused Absence Policy for University-Sanctioned Events](#) as described in the [West Chester University Undergraduate Catalog](#)), and absences due to serious illness or injury, or the death of family members (each of which is to be verified in writing by a practicing, non-related physician). If you are absent, whether excused or unexcused, **IT IS YOUR RESPONSIBILITY** to get the notes you missed from a classmate—including notes on any quantitative problems worked in class—and to learn of any important announcements that were made. I reserve the right to increase the number of dropped days of class participation due to unforeseen circumstances.

HOMEWORK

All homework will be posted and submitted online through the “homework” section of this course’s D2L webpage. There will be TEN homeworks assigned over the course of this semester. **YOU ARE RESPONSIBLE FOR CHECKING D2L AND KEEPING UP WITH HOMEWORKS**: this means checking to see that an assignment has been posted, knowing when it is due, and ensuring that it is completed before the deadline. To help you with this, I have included a column in the class schedule at the end of this syllabus that tells you **WEEK BY WEEK** what homeworks will be posted, when they will be posted (all homeworks are available at 8 am), and when they will be due (all homework is due by 11 pm). If the course schedule is

adjusted from what appears at the end of this document, it will be posted to D2L and there will be an announcement made in class. Life can get very busy during a semester, so it can be hard to remember to log in to do homeworks even when you know the dates that they are being posted and will be available. Thus, you may wish to set up pre-timed reminders to check in on our course's D2L site. **I will not always remind you in class about homeworks!** It is **YOUR RESPONSIBILITY** to remember to do them.

You may re-do homework as often as you like before it is due; I will keep only your highest score for my gradebook. But regardless of how many times you attempt one, **homeworks are due on the due date and time indicated on D2L**. No late homeworks will be accepted, **no exceptions**. This is because homework solutions will be posted shortly after the homework's due time. At the end of the semester, I will drop your lowest homework grade. This way, it's not a big deal if you miss one assignment. However if not doing homework becomes a habit, your grade **will** suffer come the end of the semester.

If you have a question or a computer problem, you must notify me at least 48 hours before the homework due date. Plan on your internet access and/or computer failing at the *worst possible time*, so **have a go at the homework at some point before the day it is due**. Report any problems with D2L ASAP by calling 1-877-325-7778 or visiting the D2L help desk in Anderson Hall Room 2 (610-436-3350, option 1).

I encourage you to discuss the homework problems with each other, but ***the work you do on homeworks must be your own***. (See the Academic Integrity statement below.) I also encourage you to discuss and review course material with your classmates. But do be sure to study and think about the material on your own, because your classmates cannot help you on exams.

As with any technology, problems with online D2L assessments can pop up unexpectedly, and for this reason I reserve the right to change details about how they are conducted. I also reserve the right to modify homework due dates and times due to unforeseen circumstances. You will be notified of any such changes both in class and on D2L.

EXAMS

The dates of each exam can be found on the class schedule. The range of chapters each exam covers is given in the class schedule, which can be found at the end of this syllabus. If the class schedule is adjusted from what appears at the end of this document, it will be posted to D2L and there will be an announcement made in class. Make sure to check D2L regularly to ensure that you have an up-to-date class schedule. **You** will be responsible for knowing what chapters will be covered on an exam, and when it is.

YOUR LOWEST EXAM GRADE WILL BE DROPPED. Thus only your three highest test grades will be counted. **THERE WILL BE NO MAKE-UP EXAMS GIVEN.** You **CANNOT** take an exam early or late. If you miss an exam, you will receive a zero for it, and it will be used as your dropped exam. Exceptions will be made **ONLY** for absences due to [University-Sanctioned Events](#) as described in the [West Chester University Undergraduate Catalog](#). If you have ANY questions or concerns about this particular point, please come talk to me and get clarification **BEFORE** it is too late!

Tests will consist of approximately 10—25 multiple choice questions. Some tests **MAY** contain one open-ended problem; any open-ended problem appearing on an exam will be designed to be similar to example and practice problems done in class. A constant curve will be applied to an exam if

the class average drops below 75% to increase it to this value. The scope of each test (with the exception of the final) is limited to the chapters listed in the class schedule at the end of this syllabus; however, even though earlier material is not explicitly tested it may still appear on an exam. You have been warned!

Tests will be closed book and closed notebook. However, I will give you one sheet of equations to use during the exam. This equations sheet will be **the only aid** allowed to you during exams, with the exception of a stand-alone calculator (as described below). All other written and electronic aids are **strictly forbidden**. I will post on D2L the equations sheet that I will give you for an exam prior to the exam time, so that you can see what will be on the sheet. You are permitted to use a stand-alone calculator (i.e., one that is **not** part of an iPod/iPad, cell phone, tablet PC, Kindle, etc.) during exams. If I catch you using an internet-accessible personal electronic device as a calculator during an exam, I will take your exam and you will get a zero on it. No exceptions. If you will be using a graphing calculator, I must personally see you clear its memory before you receive your exam. I will NOT bring extra calculators for you to use during exams. It is **YOUR RESPONSIBILITY** to make sure that you have a working stand-alone calculator for exams.

After each exam, I will return to you the answer sheet which contains your responses to the multiple choice questions. If the exam asked an open-ended question, your response to that question will also be returned. I will write your overall exam grade at the top of the multiple choice answer sheet. I will hold the copies of the multiple choice exam questions in my office after you have seen them; you can make an appointment to come look at the multiple choice exam questions.

FINAL EXAM

The final exam for this course will be given at the time specified by the registrar for courses meeting in our time slot. This is currently Friday, December 16th from 8:00 AM—10:00 AM. If this changes for any reason I will notify you either in class, via D2L, via e-mail or some combination of all three. The final **will be cumulative**, and **it is mandatory**. It will consist of approximately 35—45 multiple choice questions and **may include** 1-2 open-ended questions. Missing the final exam will result in a zero for the exam unless TRULY EXCEPTIONAL circumstances apply. Your final exam grade **cannot** be counted as your dropped exam score.

Extra Credit

I am offering **one** extra credit opportunity this semester. It is entirely optional; you are not required to do it. It will involve using the physics you learned during the semester to analyze an athletic activity. If you plan on completing the extra credit activity you must sign-up for it by September 30th. (I will post a signup sheet on the door to my office.) Projects must be e-mailed to me by **5 pm on December 2nd**. Successful completion of the project will count as a 1 percent boost to your exam grade.

TECHNOLOGY POLICY

I allow the use of cell phones, tablets, or laptop computers in class note taking related activities. You may use a tablet etc. to annotate the lecture slides posted on D2L prior to each meeting. You may also, with my express permission, record lectures for your sole personal and private use. Use of technology for any other purpose including but not limited to texting, e-mail, social networking, playing video games, or surfing the internet, is prohibited. Any infraction will result in both me banning your use of electronic devices in future classes, **and a 5 point penalty** on your nearest exam. **NO EXCEPTIONS**. I do understand that use of a laptop, or other personal electronic devices, may be required to accommodate certain

disabilities. Terms of use in both of these cases can be discussed with me on an individual basis.

TUTORING

Tutoring for PHY 100 is offered by the [Learning Assistance Resource Center](http://www.wcupa.edu/ussss/larc/) (LARC), 224 Lawrence Center, phone number 610-436-2535. See the following website for more information: <http://www.wcupa.edu/ussss/larc/>. LARC tutoring is free of charge, but you must sign up at the beginning of the semester. Physics majors MAY offer tutoring in PHY 100 during the semester. An announcement will be made in class if this is the case.

WITHDRAWAL NOTICE

A syllabus constitutes a contract between student and instructor. Your continued enrollment after the **September 6th drop deadline** indicates that you accept all instructional practices, requirements, and policies. If you find the standards to which you will be held accountable too rigorous, or if you are unable to *reliably* access the internet to log on to D2L, or if an ongoing scheduling conflict prevents you from attending class regularly and punctually, you must officially withdraw (grade “W”) through the Registrar’s Office by the **October 28th course withdrawal deadline**. You are responsible for checking your grades before this withdrawal deadline so you aren’t surprised by your standing as the end of the course approaches. You can contact me anytime to get an estimate of your grade as it stands at the moment.

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.

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.

Study tips:

- Keep up with the readings and do them before class! Physics makes more sense if the exposure you get to an idea in class is your second time seeing it.
- Don't blow off the homework! It's a good way to accumulate points, and good practice for exams. Look in on D2L periodically to make sure

you've made an attempt on an assigned homework! ***The homework is the “curve.”***

- Explain what you are studying to a friend. Sometimes the best way to test your mastery of the material is to see if you can adequately explain it.
- Check on D2L to see if I've posted any practice problems before tests or to go with the readings. They will be **ENTIRELY VOLUNTARY**, so you won't be graded on them or have your grade depend on doing them; however, they *can* help you gauge how well you understand the material. I will **try** to post practice problems, but cannot guarantee that every reading will have a set of these problems.
- Play games with physics! More specifically, try playing “what-if” games with the concepts presented in class: If a flower pot bounced off one guy's head, but fell and shattered off another's, who feels the bigger force? What if a bug splats on a car window: does the bug or the car feel the bigger force? If you've played a little bit with concepts ahead of time, you're less likely to freeze up and panic if you see them on a test.
- Play “what-if” games with equations, too: What if I gave you two quantities and asked for a third? What's your plan for that? How about if one of two quantities in an equation gets bigger—what happens to the other one? If you have an action plan for these things in your head, you're less likely to freeze up and panic if I ask you to do them on a test.
- Please make use of my office hours, and don't hesitate to email me questions about the homework or to schedule a time to meet outside of office hours. ***I cannot guarantee an instantaneous response, but I try to respond to all class related e-mails within 24 hrs.***

Date (mm/dd)	Day	#	Topic	HW	Reading to be done before the course meeting
08/29	M	1	Course Introduction, Logistics, Introduction	Practice HW Available	Ch. 1: "First Grade," "On Building a World View," AND Ch. 11: "Building Models"
08/31	W	2	Building a World View / What is Physics		
09/02	F	3	What "Counts" as Physics / Measurement	Practice HW Due	Ch. 1: "Bode's Law," "Measurements," and "Sizes: Large and Small"
09/05	M		LABOR DAY NO CLASS		
09/07	W	4	Measurement / Scales / Speed	HW 1 Available on D2L	Ch. 1: "Sizes: Large and Small;" Ch. 2: "Average Speed," and "Images of Speed"
09/09	F	5	Speed / Velocity		Ch. 2: "Images of Speed," "Instantaneous Speed," and "Speed with Direction"
09/12	M	6	Acceleration / the Kinematic Equations of Motion	HW #1 Due	Ch. 2: "Acceleration" and "A First Look at Falling Objects"
09/14	W	7	the Kinematic Equations of Motion / Free-fall	HW 2 Available on D2L	Ch. 2: "Free Fall: Making a Rule of Nature," "Starting with an Initial Velocity," and "A Subtle Point"
09/16	F	8	Adding Vectors / Force / Different Forces		Ch. 3: "Adding Vectors," "An Early Explanation," "The Beginnings of Our Modern Explanation," "Weight," and "Friction"
09/19	M	9	Newton's Laws / Mass vs. Weight	HW #2 Due	Ch. 3: "Newton's First Law," "Newton's Second Law," and "Mass and Weight"
09/21	W	10	Newton's Laws / Free-Body Diagrams	HW #3 Available on D2L	Ch. 3: "Mass and Weight," "Newton's Third Law," and "Free-Body Diagrams"
09/23	F	11	Review for Exam I		Chapters 1-3.
09/26	M	X	Exam 1	HW #3 Due	Chapters 1-3
09/28	W	12	Uniform Circular Motion		Ch. 4: "Circular Motion," "Acceleration Revisited," and "Acceleration in Circular Motion"
09/30	F	13	Uniform Circular Motion / Projectile Motion	Extra Credit Signup Due	Ch. 4: "Acceleration in Circular Motion" and "Projectile Motion"
10/03	M	14	Projectile Motion	HW #4 Available on D2L	Ch. 4: "Projectile Motion" and "Launching an Apple into Orbit"
10/05	W	15	Projectile Motion / Newton's Gravity		Ch. 4: "Launching an Apple into Orbit" and Ch. 5: "The Concept of Gravity"
10/07	F	16	Newton's Gravity		Ch. 5: "The Concept of Gravity," "Newton's Gravity," and "The Law of Universal Gravitation"
10/10	M		FALL BREAK NO CLASS		
10/12	W	17	Newton's Gravity / Gravitational Fields	HW #4 Due	Ch. 5: "The Law of Universal Gravitation," "The Value of G," and "The Field Concept"
10/14	F	18	Tides / Momentum / Impulse	HW #5 Available on D2L	Ch. 5: "Tides;" Ch. 6: "Linear Momentum" and "Changing an Object's Momentum"
10/17	M	19	Momentum / Impulse	HW #6 Available on D2L	Ch. 6: "Changing an Object's Momentum" and "Conservation of Linear Momentum"
10/19	W	20	Systems / the Law of Conservation of Linear Momentum / Collisions	HW #5 Due	Ch. 6: "Conservation of Linear Momentum" and "Collisions"

10/21	F	21	Review for Exam 2	HW #6 Due	Readings from CH 4-6
10/24		X	Exam 2		Chapters 4-6
10/26	W	22	What is Energy / Kinetic Energy		Ch. 7: "What is Energy?" and "Energy of Motion"
10/28	F	23	Work / Gravitational Potential Energy		Ch. 7: "Changing Kinetic Energy," "Forces That Do No Work" and "Gravitational Potential Energy"
10/31	M	24	Gravitational Potential Energy / The Law of Conservation of Mechanical Energy		Ch. 7: "Gravitational Potential Energy" and "Conservation of Mechanical Energy"
11/02	W	25	The Law of Conservation of Mechanical Energy / Power	HW # 7 Available on D2L	Ch. 7: "Conservation of Mechanical Energy" and "Power"
11/04	F	26	Power / Rotational Motion	HW #8 Available on D2L	Ch. 7: "Power" AND Ch. 8: "Rotational Motion"
11/07	M	27	Torque / Extended Free-Body Diagrams		Ch. 8: "Torque," "Center of Mass," and "Extended Free-Body Diagrams"
11/09	W	28	Extended Free-Body Diagrams / Static Equilibrium	HW # 7 Due	Ch. 8: "Extended Free-Body Diagrams"
11/11	F	29	Review for Exam 3	HW #8 Due	Chapters 7 and 8
11/14	M	X	Exam 3		Chapters 7-8
11/16	W	30	Vibrations	HW #9 Available on D2L	Ch. 15: "Simple Vibrations" and "the Pendulum"
11/18	F	31	Resonance / Waves		Ch. 15: "Resonance," "Waves," and "One-Dimensional Waves"
11/21	M	32	the Superposition of Waves		Ch. 15: "Periodic Waves" and "Superposition"
11/23	W		THANKSGIVING BREAK		
11/25	F		THANKSGIVING BREAK		
11/28	M	33	Superposition / Standing Waves	HW #9 Due	Ch. 15: "Superposition" and "Standing Waves"
11/30	W	34	Interference and Diffraction	HW # 10 Available on D2L	Ch. 15: "Interference" and "Diffraction"
12/02	F	35	Sound / Hearing Sounds	Extra Credit Project Due by 5 pm	Ch. 16: "Sound," "Speed of Sound," "Hearing Sounds," and "The Recipe of Sounds"
12/05	M	36	Musical Instruments		Ch. 16: "Stringed Instruments," "Wind Instruments," and "Percussion Instruments"
12/07	W	37	Beats / the Doppler Effect	HW #10 Due	Ch. 16: "Beats" and "The Doppler Effect"
12/09	F	X	Exam 4		Chapters 15-16
12/12	M		Review for Final		