Elements of Physical Science (PHY 100-02)

Spring, 2024, Dr. Pfeil

COURSE DESCRIPTION: A study of motion, energy, light, and some aspects of modern physics. This is a conceptual physics course. ***PHY 100 is an approved science distributive course in the WCU general education program (details provided later in the syllabus.)***

Mathematical Requirements: This is a conceptual physics course, so we will be using less mathematics than in an algebra-based physics course like PHY 130, or a calculus-based course like PHY 170. However, we will be using mathematical reasoning. Physics involves measured quantities, such as length and time, and algebra is the way we describe relationships between these kinds of quantities. As a result, we will be doing some algebra and algebraic thinking in this class. We will also be dealing with ratios and a little geometry. *We will <u>not</u> be doing trigonometry.*

INSTRUCTOR INFORMATION:

Dr. Shawn H. Pfeil (*last name pronounced "file"*)
e-mail: spfeil@wcupa.edu (please identify which course you are contacting me about)
phone: (610) 430-4084
office: SECC 363

COURSE MEETING TIME AND PLACE OTHER TIME COMMITMENTS:

This course meets for about three hours. Lecture/discussion meetings are in Science Complex North 190. Homework is due Thursday nights by 11:59 pm, on the material from the previous week. Homework is designed to take 1-1.5 hours to complete. Please start it early.

OFFICE HOURS

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
SECC 363 (my office)	10-11 am	10-11 am	11 am – 1 pm	10-11 am	Research Day **NO OFFICE HOURS**
	Monday	Tuesday	Wednesday	Thursday	Friday

Office hours are available by appointment for students with an ongoing conflict with my scheduled hours. Please note office hours are subject to change. Please see D2L for any updates.

OPEN DOOR POLICY:

- If it is office hours, and I am not helping another student, I will stop whatever I am doing and help you.
- If it is not office hours <u>and</u> my office door is open, I will finish whatever task I am engaged in (the e-mail I am writing etc.) and then I will help you.

- If my door is closed, I have a deadline and cannot help you right now. Please come back.
- You might find a note on my door saying I am in my research space. It is one floor down…come find me.

OTHER PLACES TO GET HELP (TUTORING):

If you need help beyond office hour, The LARC, (610) 436-2535, usually provides tutoring for this course. (https://www.wcupa.edu/universityCollege/larc/students.aspx) Peer tutoring is also typically provided by the Society of Physics Students (SPS). I will post their schedule once it is available. They are a student organization, and it typically takes them several weeks to organize. If you need help brushing up on a mathematical tool, the Department of Mathematics also offers tutoring at the Math Center located in UNA 105. Please note, this last resource is for mathematics only.

HOW TO SUCCEED IN THIS COURSE:

A successful Physics student…

- ***is organized.***
    1. Knows when all homework assignments are due (by checking the homework system calendar).
    2. Knows when each exam is scheduled (from the course calendar on this syllabus).
    3. Has read the reading for the lecture before lecture (so they know what questions they have).
    4. Has scheduled time to work on Physics outside of class.
- ***keeps up with the material.***
    1. Learns each piece of technical vocabulary the day it is presented. (Otherwise, the lectures quickly unintelligible).
    2. Does the homework problems associated with each lecture within a day of the end of lecture (to allow plenty of time to get to office hours with questions.)
- ***actively engages with the material.***
    1. Work the book examples. (Read with a pencil in hand).
    2. Notes down any questions they have from the reading.
    3. Works the practice problems given in class.
    4. Does not worry about copying down example solutions, they are available after class, but rather tries to think through the example solutions with the professor.
- ***is not afraid to get help***. Physics can be a lot. You will have questions. Find me in office hours. Don't let anything slide.

MY PROMISE TO YOU:

I cannot promise that this course will be easy. Worthwhile endeavors usually are not easy. **I can, and do, promise that I will do everything in my power to make this course straight-forward.** It is my goal that you never be surprised by the kind of problems you see on an exam, that you always know what is most important to study, and that the path to success is always well

marked. If you have any questions, ask me. Find me during office hours, find me out of office hours, or e-mail me.

REQUIRED COURSE MATERIALS

Textbook

CONCEPTUAL PHYSICS
ISBN: 9780321909107
BY HEWITT, PAUL G. AND HEWITT, PAUL
List Price: $259.99

Inclusive Access Price: $89.40

Gaining Access: You will be able to register for Modified Mastering Physics with the e-book included directly from the courses D2L (course management) website.

If You Drop the Course: You can opt-out of inclusive access until the drop/add deadline. You should have received an e-mail with a link to do this. If you opt-out you receive a refund.

Calculator

You will want a basic scientific calculator for this course. Something at the level of a Ti-30 or nicer is recommended. You don't need anything fancy or expensive. For example, a Ti-30Xa, retail price $8.99, is perfectly sufficient.

Please note you will never be able to use your cellphone, tablet, etc., as a calculator in class. If you own a fancier calculator, with a memory function, you may use it provided you clear the memory prior to each exam.

GRADED COURSE COMPONENTS, WEIGHTS, POLICY ON MISSED EXAMS

I will be using the D2L grade-book feature to post course grades. Please check it periodically. (*Please note that I reserve the right to change the weights of course components in the event of unforeseen circumstance.)*

- **Homework** (15%): **It is your responsibility to check the online homework system periodically** for assignment updates. **Due dates will not be moved forward but may be pushed back.** Homework is due Thursday at 11:59 pm. Any late portion of the homework will receive a 25% reduction in grade. *The homework can take some time, plan accordingly. If you work through it all, things should be straight-forward come exam-time.*
- **Regular Exams:** (60%): We will have three (3) regular exams of equal weight. **No exam scores are dropped.**
- **Final:** (25%): We will have a cumulative final worth 25%. All students are required to take the final exam. The final exam score may not be dropped. This exam covers all the material for the course.

I will give a make-up exam, or provide other adjustment, such as weighting your final more heavily, under the following conditions:

- You missed the exam for a **University Sanctioned Event,** notified me in advance, and provide some form of documentation (performing arts program with you listed as cast, competition schedule signed by your coach etc.)
- You missed an exam due to a truly unavoidable commitment and you let me know in advance. You must let me know in advance, so that we can make sure that we agree the commitment is truly unavoidable. (This is the category that includes family weddings and funerals etc.) Again, you'll need to provide documentation.
- You missed the exam due to some completely unforeseeable event which is completely out of your hands. For example, you are driving to the exam and get into a car accident, get admitted to the hospital, your roommate tells you they have COVID the night before the exam and you must quarantine. In this case you need to tell me as soon as it is feasible and safe to do so

If you have or need an accommodation under the ADA for an exam: You are responsible for making the appropriate arrangements **at least a week prior** to the exam date and time. These arrangements must include getting a letter from OEA. Please see the "accommodations for Students with Disabilities" statement. ***This is also the proper way to deal with temporary disabilities.*** For example, if you break your writing-hand and need more time on exams because you must write with your non-dominant hand.

GRADE CALCULATION:

The standard WCU scale for grades (see table below). I round your course-grade up at 0.5 and calculate them to the tenths place. For example, 92.5% rounds to 93% so it is an A not an A-.

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

SOFTWARE AND WEB RESOURCES

We use two web-based resources in this class.

MasteringPhysics the homework system from the textbook publisher. This is included with the textbook license. Please note that this system works best with the Chrome or FireFox web browsers (both freely available). ***It has compatibility issues with Apple's Safari Browser.***

Used For:

- Accessing the electronic textbook.
- Doing online homework.

Bright Space (by D2L) a course management software environment. (This is the same class of online software as Canvas or Moodle).

WEST CHESTER UNIVERSITY GENERAL EDUCATION LEARNING OUTCOMES:

PHY 130 is approved as a WCU General Education Science Distributive course, and as such meets the following General Education Goals:

GENERAL EDUCATION GOALS:

As a Science Distributive course, we will address the following General Education Goals and learning objectives.

General Education Goal 1: Communicate Effectively

Students will work on effective communication by *Demonstrating comprehension of and ability to explain information and ideas accessed through reading.* I will assess our progress towards effectiveness towards this goal via a combination of exams, and observation of student discussions during class polling activities.

We will work on expressing oneself effectively in common college-level written forms. But I explicitly do not mean essays. We will be working developing our ability to combine quantitative arguments and writing into coherent narratives leading to a conclusion. This particular written form which we will call the "problem set" has a long and storied tradition. *Progress will be assessed via exams, and assignments.*

General Education Goal 2: Think Critically and Analytically

Students will work on *reaching sound conclusions based on a logical analysis of evidence.* We will work on using the scientific method, a method for reaching sound conclusions by analyzing evidence. We will also work on our ability to use quantitative reasoning to reach conclusions using measured quantities as evidence. Progress towards this goal will be assessed via exams, and homework.

General Education Goal 3: Employ quantitative concepts and mathematical methods

Students will work towards this general education goal by employing quantitative methods to examine a problem in the natural or physical world. That problem is the description and prediction of the motion of objects. We will employ quantitative methods, read as "doing math" to solve some problems arising from kinematics. We will also employ quantitative methods, read as "measuring numerical data," in "demo experiments." Progress towards this objective will be monitored via homework and exams.

Students will also apply the basic methods and thought processes of the scientific method for natural/physical science as appropriate to the discipline of Physics. We will as a class analyze demonstrations. To do this we will utilize a wide range of tools including graphical analysis. Progress towards this objective will be monitored via exams, homework, and observation of in-class experiments.

ATTENDANCE POLICY:

Attendance is taken for this course. Attending lecture, while highly correlated with success in this course is not graded. *Please note that I am required to report attendance to the University, and that this attendance can have financial aid implications.*

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 & 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.

ONLINE RESOURCES AND ACADEMIC INTEGRITY:

Posting of any of the homework or exam questions from this course to Chegg, Course Hero, or any other site where solutions are made available for a fee is a violation of the academic integrity policy. Copying solutions to problems from these websites is a form of plagiarism, since any student that does so passes off others work as their own. Solutions from any website which charges fees counts as buying solutions. Posting any materials which I have written, i.e., any exam questions in the course, is a violation of both academic integrity and a misuse of my intellectual property. Posting or accessing any exam course exam questions on these sites, at any time, will result in sanctions up to and including an F in the course.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

West Chester University is committed to providing equitable access to the full WCU experience for Golden Rams of all abilities. Students should contact the Office of Educational Accessibility (OEA) to establish accommodations if they have had accommodations in the past or if they believe they may be eligible for accommodations due to a disability, whether or not it may be readily apparent. There is no deadline for disclosing to OEA or for requesting to use approved accommodations in a given course. However, accommodations can only be applied to future assignments or exams; that is, they can't be applied retroactively. Please share your letter from OEA as soon as possible so that we can discuss accommodations. If you have concerns related to disability discrimination, please contact the university's ADA Coordinator in the Office of Diversity, Equity, and Inclusion: https://www.wcupa.edu/_admin/diversityEquityInclusion/ or 610-436-2433.

EXCUSED ABSENCES POLICY

Students are advised to carefully read and comply with the excused absences policy, including absences 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 comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator. 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:
https://www.wcupa.edu/_admin/diversityEquityInclusion/sexualMisconduct/default.aspx

INCLUSIVE LEARNING ENVIRONMENT AND ANTI-RACIST STATEMENT

Diversity, equity, and inclusion are central to West Chester University's mission as reflected in our Mission Statement, Values Statement, Vision Statement and Strategic Plan: Pathways to Student Success. We disavow racism and all actions that silence, threaten, or degrade historically marginalized groups in the U.S. We acknowledge that all members of this learning community may experience harm stemming from forms of oppression including but not limited to classism, ableism, heterosexism, sexism, Islamophobia, anti-Semitism, and xenophobia, and recognize that these forms of oppression are compounded by racism. Our core commitment as an institution of higher education shapes our expectation for behavior within this learning community, which represents diverse individual beliefs, backgrounds, and experiences. Courteous and respectful behavior, interactions, and responses are expected from all

members of the University. We must work together to make this a safe and productive learning environment for everyone. Part of this work is recognizing how race and other aspects of who we are shape our beliefs and our experiences as individuals. It is not enough to condemn acts of racism. For real, sustainable change, we must stand together as a diverse coalition against racism and oppression of any form, anywhere, at any time.
Resources for education and action are available through WCU's Office for Diversity, Equity, and Inclusion (ODEI), DEI committees within departments or colleges, the student ombudsperson, and centers on campus committed to doing this work (e.g., Dowdy Multicultural Center, Center for Women and Gender Equity, and the Center for Trans and Queer Advocacy).

Guidance on how to report incidents of discrimination and harassment is available at the University's Office of Diversity, Equity and Inclusion.

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.

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.

TENTATIVE COURSE SCHEDULE: (next page): A tentative schedule for the course follows. 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.

Date (mm/dd)	Day	Topic	Lecture #	Reading in Hewitt
01/23	T	Introduction to the Course – Some Mathematics	1	None
Week 1	R	Newton's First Law, Inertia	2	2
01/30	T	Linear Motion Part 1	3	3
Week 2	R	Linear Motion Part 2	4	3
02/06	T	Newton's 2nd Law Part 1	5	4
Week 3	R	Newton's 2nd Law Part 2	6	4
02/13	T	Newton's 3rd Law Part 1	7	5
Week 4	R	Newton's 3rd Law Part 2	8	5
02/20	T	**Exam 1: Mechanics Part I (CH 2-4)**		
Week 5	R	Momentum Part 1	9	6
02/27	T	Momentum Part 2	10	6
Week 6	R	Energy Part 1	11	7
03/05	T	Energy Part 2	12	7
Week 7	R	Temperature and Heat Expansion Part 1	13	15
03/12		**SPRING BREAK**		
Week 8		**03/13-03/19**		
03/19	T	Temperature and Heat Expansion Part 2	14	15
Week 9	R	Heat Transfer Part 1	15	16
03/26	T	**Exam 2: Mechanics Part II (CH 5-7)**		
Week 10	R	Heat Transfer Part 2	16	16
04/02	T	Change of Phase Part 1	17	17
Week 11	R	Change of Phase Part 2	18	17
04/09	T	Thermodynamics Part 1	19	18
Week 12	R	Thermodynamics Part 2	20	18
04/16	T	Vibrations and Waves 1	21	19
Week 13	R	Vibrations and Waves 2	22	19
04/23	T	**Exam 3: Thermal Physics (CH 15-18)**		
Week 14	R	Sound Part 1	23	20
04/30	T	Sound Part 2	24	20
Week 15	R	Musical Sound	25	21
Week 16 (Finals Week)	T	**Final Exam, 05/07/2024 Same Location as Lecture (Science Complex North 190) 10:30-12:30 pm**		