

General Physics I (PHY130)

COURSE MEETING TIME AND PLACE:

Course Section	Meeting Time	Location
130-03 (Lecture), 93 (Discussion)	MWF 9:00-9:50 AM, W 8:00-9:00 AM	SSN 192, Merion 113
130-04 (Lecture), 94 (Discussion)	MWF 12:00-12:50 PM, W 3:00-4:00 PM	Merion 109, Merion 112

INSTRUCTOR INFORMATION:

Dr. Tianran Chen

e-mail: tchen@wcupa.edu (please include **PHY130** in the subject line of any e-mail)

phone: (610) 436-3563

office: Merion Science Center 128

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.

Monday	Tuesday	Wednesday	Thursday
1:00 – 3:00 PM	3:30 – 4:30 PM	4:00 – 5:00 PM	4:30 – 5:30 PM

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

REQUIRED COURSE MATERIALS:

- *Physics, 5th Ed*, by James S. Walker, **including** access code for Modified Mastering Physics (5th Ed by Walker).
(see email/D2L for purchase options and registration instructions)
- Laboratory Notebook
- Stand-alone calculator

COURSE DESCRIPTION:

Physics 130 (General Physics I) is the first semester of an introductory, algebra based, physics sequence. Topics covered include kinematics, dynamics, the mechanics of solids and fluids, wave motion, heat and temperature, and kinetic theory. In less technical language, we will cover the mathematical description and modeling of motion (kinematics), how forces give rise to changes in motion (dynamics), and a number of applications on the macroscopic and microscopic scale. *Physics 130 is primarily a service course for students in biological and health science fields, so we will emphasize applications to these fields, and to a lesser extent geophysics.*

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: A good working knowledge of algebra and trigonometry are pre-requisites for this course. Mathematical language provides the precision required to state physical laws and the tools to manipulate them. We will be using algebra and trigonometry on a daily basis. *If you feel you have any deficiencies in your mathematical preparation please see me.*

WEST CHESTER UNIVERSITY GENERAL EDUCATION LEARNING OUTCOMES:

This course (PHY130) 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 mechanics and thermodynamics.

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.

Mechanics and thermodynamics, the primary subject matter of this course, involve the complex interplay of such concepts as force, momentum, and potential 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 collision of a projectile with a hanging block.

ADDITIONAL LEARNING OUTCOMES:

1. Ability to mathematically model physical situations using the concepts of introductory physics.

- Students will demonstrate the ability to identify the crucial elements of open ended problems (on homework, in class, and on exams) and identify the appropriate physical concepts to solve them.

2. Ability to solve physics problems arising from modeling.

- Students will demonstrate the ability to identify forces and break them into components.
- Students will demonstrate the ability to apply the concepts of Work, Energy, and Conservation of Energy.
- Student will demonstrate the ability to apply the concepts of Momentum and Angular Momentum.
- Students will demonstrate the ability to apply the concept of torque.

3. Ability to combine multiple concepts to solve “two-step” problems.

- Students will demonstrate the ability to use two or more concepts or methods in series to solve more complicated problems. For example, students will demonstrate the ability to calculate the force on an object, the work that force does, and using the Work-Energy theorem the change in velocity of the object.

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%):
Weekly homework assignments labeled “HW#” are typically due at **11:59pm on Wednesday**. Assignments labeled “Ch#-practice” are NOT for credit but for additional practice only. All assignments have a clearly labeled due date on Modified Mastering Physics. **It is your responsibility to check Mastering periodically for assignments.** Answers to all homework problems are available on Mastering immediately after the assignment is due. **Because answers are available immediately, late homework will NOT be considered.**
- **Regular Exams** (3×16% = 48%): Four regular exams will be given during the semester. I will keep your highest three scores. There are no make-up exams.
 - **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 OSSD letter pertaining to exams:** You are responsible for making the appropriate arrangements at least one week prior to the exam date and time.
 - Regular exam dates are subject to changes (snow days, Mastering maintenance, schedule adjustments, etc.). Be available for class days before & after.
- **Final Exam** (22%): 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) can be found here: <https://www.wcupa.edu/registrar/calendar/documents/spring18FinalExamSchedule.pdf>. **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.

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.

In terms of the WCU standard and the courses point system grades are as follows.

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

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 130. (Please note some students may need more than 12.5 hrs/week to master the material.)

Activity	Time Commitment
Reading Prior to Class	1.0 hrs/week
Class	3.5 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	0.5 hrs/week
Total Time Spent	12.5 hrs/week

TENTATIVE COURSE SCHEDULE: 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		Lecture	Reading	Laboratory
M	Jan 22	Introduction, Units, and Trigonometry	1.2 - 1.5	Uncertainty Analysis
W	Jan 24	Scalars & Vectors; Vector Addition and Subtraction	1.7, 3.1, 3.3	
W	Jan 24	Components of a Vector	3.2	
F	Jan 26	Vector Addition Using Component Method	3.3 – 3.4	
M	Jan 29	Motion in 1-D: Displacement, Velocity & Acceleration	2.1 – 2.4, 3.5	Measurement
W	Jan 31	Equations of Kinematics in 1D	2.5 – 2.6	
F	Feb 2	Free Fall	2.7	
M	Feb 5	Motion in 2-D; Projectile Motion	4.1 – 4.2	Kinematics
W	Feb 7	Projectile Motion cont'd	4.3 – 4.5	
F	Feb 9	Force and Mass, Newton's Laws of Motion	5.1 – 5.4	
M	Feb 12	Vector nature of Forces; Gravitational Force, Weight	5.5-6, 12.1-2	Free Fall
W	Feb 14	Normal Force	5.7	
F	Feb 16	EXAM 1: Chapters 1 – 4		
M	Feb 19	Static and kinetic Friction	6.1	Projectile Motion
W	Feb 21	Friction cont'd; Tension, Spring force	6.2	
F	Feb 23	Equilibrium problems	6.3	
M	Feb 26	Non-equilibrium problems; Uniform Circular Motion	6.5	Newton's 2 nd Law
W	Feb 28	Uniform Circular Motion cont'd	6.5	
F	Mar 2	Work, Kinetic Energy, Power	7.1 – 7.4	
M	Mar 5	Potential Energy, Conservative Forces	8.1 – 8.2	NO LAB
W	Mar 7	Conservation of Mechanical Energy	8.3	
F	Mar 9	Non-Conservative Forces	8.4	
M	Mar 12	SPRING BREAK		
W	Mar 14			
F	Mar 16			
M	Mar 19	Impulse and Momentum	9.1 – 9.3	Energy Conservation
W	Mar 21	Conservation of Momentum; Collisions in 1D	9.4 – 9.6	
F	Mar 23	EXAM 2: Chapters 5 – 8		
M	Mar 26	Rotational Motion, Rotational Kinematics	10.1 – 10.2	Collisions
W	Mar 28	Centripetal & Tangential Acceleration, Rolling Motion	10.3 – 10.4	
F	Mar 30	Rotational Kinetic Energy, Moment of Inertia	10.5 – 10.6	
M	Apr 2	Torque and Equilibrium	11.1, 11.3	Angular Dynamics
W	Apr 4	Center of Gravity and Newton's III law for rotation	11.2, 11.5	
F	Apr 6	Angular Momentum	11.6 – 11.7	
M	Apr 9	Periodic Motion, Simple Harmonic Motion	13.1 – 13.2	Springs & Oscillations
W	Apr 11	Oscillatory Motion, Pendulum	13.4 – 13.6	
F	Apr 13	EXAM 3: Chapters 9 – 11		
M	Apr 16	Waves and Sound; Waves on a String	14.1 – 14.2	NO LAB
W	Apr 18	Sound Waves and the Doppler Effect	14.4, 14.6	
F	Apr 20	Superposition, Standing Waves and Resonance	14.7 – 14.8	
M	Apr 23	Fluids: Density and Pressure	15.1 – 15.3	Standing Waves
W	Apr 25	Fluids: Archimedes' Principle and Continuity	15.4 – 15.6	
F	Apr 27	Fluids: Bernoulli's Principle and Viscosity	15.7 – 15.8	
M	Apr 30	Temperature and Heat	16.1 – 16.5	Archimedes' Principle
W	May 2	Kinetic Theory, The laws of Thermodynamics	17.1 – 17.2 18.1 – 18.2, 18.4 – 18.5	
F	May 4	EXAM 4: Chapters 13 – 15		

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, so that both you and your neighbors will be able to concentrate on the material at hand. No texting or making phone calls is allowed in the classroom.

D2L/MODIFIED MASTERING PHYSICS:

We will be using two online platforms for this course Modified Mastering Physics, the publisher’s homework system, and D2L. Homework assignments are to be performed on Mastering. 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.**

ATTENDANCE POLICY:

Attendance is not taken for this course. Attending lecture, however, is highly correlated with success in this course, and I strongly recommend it. This is your chance to ask questions, see examples and get help in solving problems, which will significantly improve your grade. The lab component of this course, however, has a different attendance policy.

DISABILITY STATEMENT:

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 contact the OSSD which is located 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.

ELECTRONIC COMMUNICATIONS STATEMENT:

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.

The subject of your emails to me should contain “**PHY130**”. I created a folder particularly for this course. Any email that does not have the correct headline format will not go into this folder, and may not get my reply in time.

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.

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.

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.