**PHY 130-03: General Physics I**

West Chester University

Spring 2021

**Instructor Office Hours**

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| --- | --- |
| Day | Time |
| Monday | 2 – 3 PM |
| Wednesday | 10:30 – 11:30 AM |
| Friday | 2 – 3 PM |

**Dr. Brandon Mitchell**

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Email: Bmitchell@wcupa.edu

Please sign up for office hours at <https://calendly.com/prof-mitchell>

**Course Details**

**Location:** ZOOM (New links the day sent before class)

**Time:**  Monday and Wednesday from 12 – 12:50 PM

**Course Description**

**Required Textbook:** Physics 5e by Walker (2016), Pearson.

**Content**

We will study kinematics, force and motion, work and energy, momentum and collisions, rotational motion, oscillations, fluid dynamics, basic wave properties, states of matter, and heat. It would be best if you tried to read the relevant sections in the text before coming to lecture.

**Course Web Page**

# The entire course is housed on D2L. The main page contains our schedule and required assignments, and lecture videos. Course information can be found here throughout the semester. The syllabus, lecture notes, quizzes, and practice exams can be found here. Check it regularly!!!

**Lecture Notes**

The lecture notes are a critical tool for your learning experience and are required for class. They contain a summary of the relevant theories and related problems, which will be attempted in class. They will be provided via D2L, so be sure to download them. You are required to bring the lecture notes to class. The lecture notes will be uploaded no later than 5 PM, two days before you need them, or else a hard copy will be provided.

**Modified Mastering Physics**

This course uses the online platform Mastering Physics for readings, assignments, and additional study materials. You may access Mastering Physics by clicking on the link on the homepage of our D2L site.

Access to Mastering Physics is provided via the Inclusive Access program. Every student enrolled in PHY 130 will be charged for a (24-month) subscription to Mastering Physics for Physics 5/e, by Walker. This charge will appear on your Bursar's Office account. More information about the Inclusive Access program is contained in an email sent to your WCUPA email account from the WCU campus store. Questions about Inclusive Access should be directed to inclusiveaccess@wcupa.edu.

If you already have an active subscription for Mastering Physics for Physics 5/e, by Walker, then you may opt-out of Inclusive Access and will not be charged by the Bursar's Office. One way to opt-out is to use the link provided in the email sent to your WCUPA email account from the WCU campus store. There may also be an opt-out link when you log in to Mastering Physics via D2L.

The Inclusive Access program provides the lowest available cost for a Mastering Physics subscription. There is no way to share a subscription with another person or transfer a subscription from one person to another.

Your Mastering Physics subscription does not include access to other Mastering products. However, PHY 140 uses the same textbook as PHY 130, so students who complete PHY 140 within 24 months may use the subscription they purchase now.

An active subscription to Mastering Physics is a course requirement. Students who are not enrolled in Mastering Physics will not be able to access assignments.

If you experience any technical problems with Mastering Physics, check your system requirements and consult the get started page. I recommend that you always use a "real computer" (not a mobile device) and the Mozilla Firefox web browser when working on Mastering Physics.

**Student Learning Outcomes**

PHY 130 is an approved course in the WCU General Education program. As such, it is designed to help students meet the following general education goals:

**General Education Goal #2:** Employ quantitative concepts and mathematical methods

**General Education Goal #3:** Think critically and analytically

More specifically, after successfully completing this course a student will be able to:

* Mathematically describe mechanical systems using the language of kinematics.
* Recognize concepts of physics in action in mechanical systems, including force, energy, momentum, angular momentum, harmonic motion, and wave phenomena.
* Analyze mechanical systems through visualization, modeling, algebra, as well as diagrammatic and graphical techniques.
* Combine the above elements to solve multi-part problems as well as formulate quantitative predictions for physical experiments.

These General Education Goals will be accomplished through in-class exercises, lab work, suggested homework problems, review exercises, a test, and several exams. These items will involve qualitative and semi-quantitative aspects as well as fully quantitative aspects.

**My Goals**

I hope to expand your knowledge of physics and how it relates to the world, further develop your analytical, conceptual, and critical thinking skills and enable you to apply physics to real life and qualitative situations. I also hope you find at least one concept or application that excites or intrigues you.

**Expectations**

I expect you to engage the material, your peers, and me both in and out of class and lab in physics-related conversations. I do not expect you to love math in all of its intricacies but do expect you to have a basic understanding of algebra, trigonometry, and geometry. When problems with math arise, I expect you to seek assistance from your peers, the tutoring center, or myself. I am happy to assist/review with you. You may find this course challenging and fast-paced, but as long as you work diligently, you will succeed.

**Office Hours**

You set the agenda for office hours. Come with questions about the lecture, reading, homework, exams, grading, or anything else of concern or interest. Note: You must demonstrate some effort/thought process towards an answer to homework problems before coming to see me. "I have no idea where to begin" is not an acceptable opening statement.

**Attendance Policy**

Students are expected to attend 75% of online ZOOM sessions. Students will be held responsible for all course materials missed due to class absences. All efforts will be made on my behalf to ensure that class time is productive and beneficial for your learning. We will go through several examples with problem-solving strategies. You are expected to attend all labs; see the laboratory section for more details. Obviously, if you are sick or unwell, then you should not attend class. Students who have more than nine absences by the end of the term will be reported as having poor attendance. Students who fail the course while having poor attendance may receive a “Z" grade (see the WCU Title IV Federal Financial Aid Compliance Policy).

If you miss a class, it is your responsibility to make up the missed learning opportunity by reviewing the lecture slides, readings, and other course materials. You are welcome to seek assistance during office hours, but I cannot reproduce an entire lecture outside of class. Missing class does not excuse you from completing other aspects of the course on time.

**Excused Absences**

This course adheres to the WCU Excused Absences Policy. If you are unable to perform an aspect of the course due to a conflict recognized by this policy (which includes University- Sanctioned Events), you must notify me in advance so that we can make arrangements. Documentation verifying your participation in the event must be submitted via D2L (path: Assessments>Assignments>Documentation for excused absences).

**Late Work Policy**

As with all summer courses, this is a very fast-paced course. There will be three homework assignments due each week, as well as the final group project. Please e-mail one of the instructors **BEFORE** the due date, and we will try to accommodate your situation.

**Assessment**

**Homework**

You will have one homework assignment per week, which can be found on Mastering Physics. The homework assignments will contain 10-14 problems. The homework will be assigned on Friday at 5:00 PM and due the following Friday by 11:45 PM, giving you ample time to utilize all three office hour windows. You will have three attempts at each problem. Note: I will drop your two lowest homework grades.

**Quizzes**

There will be three quizzes throughout the semester. These quizzes will be given as a way to identify and correct misunderstandings and common errors. You will be given notice of a quiz at least one week before it is given. Note: I will drop the two lowest quiz grades. Quizzes will be timed and made available and turned in via Crowdmark

**Exams**

There will be three regular exams during the semester, which will be timed and made available and turned in via Crowdmark, as well as a comprehensive final exam. Exam policies and procedures will be explained in more detail in class. All exams will be closed book. In the event a student is unable to take an exam as scheduled, discussion of the exam with those that have taken the exam is forbidden. If you are unable to make it to an exam, you must contact me before the exam, and we will discuss how to proceed. I will provide the class average to give a gauge as to where you fall relative to your peers. However, NO curved grade will be put into my grade book. In general, there will not be test corrections, however, you will get improvement points if you perform better on the material from on exam on the final. In addition, there will be two opportunities for you to earn back points via review assignments on Mastering Physics. Lastly, I do not post grades on D2L. You must come to class or during office hours to pick-up your exams.

**Laboratory**

The laboratory aspect of this course of integral to your understanding of this material. It is your chance to connect the material covered in the lecture to the real world, which, let's face it, is what Physics is all about. Laboratory attendance is mandatory and unexcused absences are not acceptable and will result in failure of the course. If an emergency or catastrophe will prevent you from attending class or lab or turning in an assignment, please notify me of your situation PRIOR to the event in question when possible. 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 (verified by a practicing MD, you must provide me with a phone number), or the death of family members (also to be verified.)

**Grading Policy**

Your course grade is based on your Homework (25%), ZOOM Session Attendance (5%), Exams (50%), Quizzes (5%), and Lab (15%).

Your total homework grade will be the average grade (minus the lowest two grades) for all assignments.

Your total exam grade will be 10% for the first three examinations and 20% for the final examination. Note: taking the final exam is **MANDATORY** in this course.

**Note:** There is NO CURVE on exams nor any other individual assessment. The total grades, in the end, may be “curved” as deemed necessary to achieve a bell-curve distribution. Also, keep in mind that the homework and lab together are weighted **more heavily** than all three in-class exams. You must do well on all components of this course to do well in the course as a whole.

A letter grade will be assigned based on performance in the course according to the following scale:

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| **Grade** | **Quality Points** | **Percentage Equivalents** | **Interpretation** |
| A | 4.00 | 93-100 | Excellent |
| A- | 3.67 | 90-92 |  |
| B+ | 3.33 | 87-89 | Superior |
| B | 3.00 | 83-86 |  |
| B- | 2.67 | 80-82 |  |
| C+ | 2.33 | 77-79 | Average |
| C | 2.00 | 73-76 |  |
| C- | 1.67 | 70-72 |  |
| D+ | 1.33 | 67-69 | Below Average |
| D | 1.00 | 63-66 |  |
| D- | 0.67 | 60-62 |  |
| F | 0 | < 60% | Failure |

Refer to the Undergraduate Catalog for a description of NG (No Grade), W, Z, and other grades.

Straight percentages will be given for all work, with the mid-semester and final grade based on overall class performance. Other considerations will influence your final grade, including class participation, class and laboratory attendance, and seeking timely guidance during office hours.  Any student achieving at a level of 'C-' or below will be given an estimated grade on their mid-term deficiency grade report.

**TUTORING**

Tutoring for PHY 130 is offered by the Learning Assistance Center (LARC), 223 Lawrence Center, x2535. More information is available at http://www.wcupa.edu/ussss/larc/. LARC tutoring is free of charge, but you must sign up at the beginning of the semester. If you realize you need tutorial help, arrange it as soon as possible, and keep up with it. Delaying or missing tutoring appointments will lead to greater difficulty later.

**COVID-19 STATEMENT**

Part of West Chester University's response to the COVID-19 pandemic was to switch the vast majority of instruction to remote. This decision was made out of an abundance of caution to protect the health of all members of the WCU community. Faculty have been asked to make every effort to adapt their courses to this novel situation while still meeting the critical learning outcomes of the course. Students are asked to discuss any problems with the new course format and schedule directly with their instructors. Patience and flexibility on everyone's behalf are critical to our community's navigation of this public health crisis.

**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](http://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. Their phone number is 610-436-2564, their fax number is 610-436-2600, their e-mail address is ossd@wcupa.edu, and their website is at <https://www.wcupa.edu/universityCollege/ossd/>. In an effort to assist students who either receive or may believe they are entitled to receive accommodations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, the University has appointed a student advocate to be a contact for students who have questions regarding the provision of their accommodations or their right to accommodations. The advocate will assist any student who may have questions regarding these rights. The Director for Equity and Compliance/Title IX Coordinator has been designated in this role. Students who need assistance with their rights to accommodations should contact them at 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>

**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](http://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**

The instructor utilizes 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 the semester in which this course is held.

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| **PHY130: TENTATIVE SCHEDULE** |
| **Date** | **Topic**  | **Chapter/Section** |
| **Week 1** | **Lecture 1** | **Chapter 1, 2 (HW#0)** |
| **1/25** | **Intro => Motion =>Problem Solving => Sig Figs**  | **1.2 - 1.5**  |
| **1/27** | **Math Review => Position => Displacement**  | **2.1 - 2.2**  |
| **1/29** | **Velocity => Acceleration** | **2.3 - 2.6** |
| **Week 2** | **Lecture 2** | **Chapter 2 (HW#1)** |
| **2/1** | **Uniform Motion** | **2.6** |
| **2/3** | **1-D Kinematics Equations** | **2.6 (HW#1)** |
| **2/5** | **Free Fall and Vectors** | **2.7 (QUIZ #1)** |
| **Week 3** | **Lecture 3, 4 (QUIZ #1)** | **Chapter 3, 4 (HW#2)** |
| **2/8** | **Vectors and Ramps**  | **3.1-3.5**  |
| **2/10** | **2-D Kinematics and Projectile Motion** |  **4.1-4.3**  |
| **2/12** |  **Projectile Motion and Uniform Circular Motion** | **10.2-10.3**  |
| **Week 4** | **Lecture 4** | **Chapter 10 (HW#3)** |
| **2/15** | **Circular Motion** | **10.2-10.3**  |
| **2/17** | **Synchronous - EXAM #1 Review Day** |
| **2/19** | **EXAM #1** |
| **Week 5** | **Lecture 5** | **Chapter 5 (HW#4)** |
| **2/22** | **Forces and Newton's 1st Law** | **5.1-5.3**  |
| **2/24** | **Newton's 2nd Law** | **5.5** |
| **2/26** | **Weight => Forces @ Angles => Equilibrium** | **5.5, 5.6, 6.3** |
| **Week 6** | **Lecture 6 and 7 (QUIZ #2)** | **Chapter 5, 6 (HW#5)** |
| **3/1** | **Normal Forces => Friction** | **5.7, 6.1**  |
| **3/3** | **Newton's 3rd Law, Tension and Pulleys** | **5.4, 6.2, 6.4**  |
| **3/5** |  **Work => Kinetic Energy** | **7.1,7.2** |
| **Week 7** | **Lecture 8(a), 8(b)** | **Chapter 7 (HW#6)**  |
| **3/8** | **Hooke's Law => Work by Spring**  |  **6.2, 7.3, 7.4**  |
| **3/10** | **Synchronous - EXAM #2 Review Day** |
| **3/12** | **EXAM #2** |
| **Week 8** | **Lecture 8(b)** |  |
| **3/15** | **Spring Break!** |
| **3/17** |
| **3/19** |
| **Week 9** | **Lecture 8(b)** | **Chapter 8 (HW#7)** |
| **3/22** | **Gravitational Potential Energy (Ug)** | **8.2** |
| **3/24** | **Energy Conservation** | **8.3** |
| **3/26** | **Elastic PE (Usp) Non-Conservative Forces and Examples** | **8.2, 8.1, 8.4** |
| **Week 10** | **Lecture 9 and 10** | **Chapter 9 (HW#8)** |
| **3/29** | **Momentum/Impulse** | **9.1 - 9.3** |
| **3/31** | **Momentum Conservation/Collisions** | **9.4, 9.5** |
| **4/2** | **More Collisions => Centripetal Forces (Horizonal)** |  **9.5, 9.6, 6.5**  |
| **Week 11** | **Lecture 10 and 11 (QUIZ #3)** | **Chapter 9-11 (HW#9)** |
| **4/5** | **Centripetal Forces => Center of Mass => Rigid Bodies**  | **10.5** |
| **4/7** | **Rotational KE => Moment of Inertia => Rolling and CoE**  | **10.1, 10.5, 10.4, 10.6** |
| **4/9** | **Torque and Newton's 2nd Law for Rotations** | **11-1, 11.2**  |
| **Week 12** | **Lecture 11** | **Chapter 11 (HW#10)** |
| **4/12** | **Dynamic Applications of Torque** | **11.5** |
| **4/14** | **Static Torque => Total Equilibrium** |  **11.3, 11.4** |
| **4/16** | **EXAM #3** |
| **Week 13** | **Lecture 12** | **Chapter 11/13 (HW#11)** |
| **4/19** | **Angular Momentum and Oscillations** | **11.6, 11.7**  |
| **4/21** | **Simple Harmonic Motion** |  **13.1-13.3**  |
| **4/23** |  **Mass/Spring => Energy in Harmonic Motion** | **13.4, 13.5, 13.6** |
| **Week 14** | **Lecture 13** | **Chapter 14 (HW#12)** |
| **4/26** | **Basics of Waves, Sound**  | **14.1 - 14.4**  |
| **4/28** |  **Superposition and Interference** | **14.6, 14.7**  |
| **4/30** | **Standing Waves and Beats** | **14.8, 14.9**  |
| **Week 15** | **Lecture 14**  | **Chapter 15 (HW#13)** |
| **5/3** | **Density, Pressure and Pascal** | **15.1, 15.2, 15.3**  |
| **5/5** | **Depth Pressure => Archimedes Principle** | **15.5, 15.6**  |
| **5/7** | **More Archimedes**  | **15.5, 15.6, 14.1** |
| **Week 16** | **FINALS WEEK** |
|  |  |
|  | **FINAL EXAM** |