Physics 130: General Physics I

West Chester University
Spring 2019

Syllabus

Updated: January 17, 2019

Instructor

Prof. Ian A. Morrison
Merion Science Center 132
imorrison@wcupa.edu
+1 (610) 436-3297
ramwebs.wcupa.edu/imorrison/

Office hours

Day	Time
Monday	10:00–10:45 am
Wednesday	10:00–10:45 am
Thursday	1:00–3:00 pm
Friday	1:30–3:00 pm

Course section details

Section 130-01:

	Day	Time	Location
Class:	Monday, Wednesday, Friday	9:00–9:50 am	Merion 113
	Tuesday	3:20–4:20 pm	Brandywine 004
Final exam:	Friday, May 10	8:00–10:00 am	Merion 113

Section 130-04:

	Day	Time	Location
Class:	Monday, Wednesday, Friday	12:00–12:50 pm	Merion 109
	Wednesday	3:00–4:00 pm	Schmucker Sci N 191
Final exam:	Wednesday, May 8	1:00–3:00 pm	Merion 109

Course description

Physics 130: General Physics I is an algebra-based introductory course in mechanics. Topics include kinematics, forces, energy, momentum, rotational motion, oscillations, waves, fluids, and thermodynamics. In less technical language, we will learn the mathematical description of motion (kinematics), how forces give rise to changes in motion (dynamics), and a number of applications. Laboratory (2 hours per week) provides hands-on exploration of the physical laws and concepts discussed in class. Discussion section (1 hour per week) provides guided problem-solving exercises. This course is part of a two-semester sequence designed for students pursuing programs in biological and health sciences, as well as programs outside the sciences – consult the WCU Undergraduate Catalog to determine which physics sequence is appropriate for your program.

Prerequisites

This course uses mathematics, including algebra, trigonometry, and basic graphing skills, on a daily basis. Students who have not completed a "pre-calculus" math course in high school or college may not be prepared for this course. If you are concerned about your preparedness, please consult with me prior to the drop/add deadline of **Tuesday, January 29**.

Time commitment

This is a 4 credit-hour course. There are 4 hours of class and 2 hours of laboratory each week. In addition, this course requires (on average) 4-6 hours of reading, assignments, and studying outside of scheduled class time each week.

Student learning outcomes

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

Gen Ed Goal #1: Communicate effectively

Gen Ed Goal #2: Think critically and analytically

Gen Ed Goal #3: Employ quantitative concepts and mathematical methods

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

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

Student learning outcomes will be met and assessed through the following activities:

- **Communicate effectively:** This course develops a student's ability to *express oneself effectively in common college-level written forms* (Gen Ed SLO #1a).

  In class, peer instruction and think-pair-share exercises give students practice communicating physical concepts in plain language. Homework assignments develop a student's ability to describe physical systems in the mathematical language of kinematics. Laboratory activities, performed in groups of 2-3 students, provide further practice explaining physical systems with brevity and mathematical precision. Effective written communication is assessed through short-answer conceptual questions on in-class quizzes and the final exam, as well as Post-Lab Assignments.

- **Think critically and analytically:** This course develops a student's ability to *construct and/or analyze arguments in terms of their premises, assumptions, contexts, conclusions, and anticipated counter-arguments* (Gen Ed SLO #2b), as well as *reach sound conclusions based on a logical analysis of evidence* (Gen Ed SLO #2c).

  In mechanics, critical thinking most often takes the form of identify/analyze/predict: a student must (i) identify the aspects of physical system which determine its motion, (ii) analyze the system using physical concepts and mathematical relations, and (iii) develop a quantitative prediction for the system's behavior. Interactive video assignments, lecture, in-class "concept quizzes", and homework problems all work to develop a student's skill in this process. For example, a common in-class activity is to propose a brief experiment and ask students to formulate a prediction for the outcome of that experiment. The experiment is then performed, and students are asked to analyze the assumptions and logic that led to their prediction. Student achievement in this critical thinking process is assessed through multiple choice questions and analytic free-response problems on in-class quizzes and the final exam.

  Critical and analytical thinking is also developed in the lab. Laboratory exercises ask students to synthesize experimental results and physical reasoning in order to construct explanations of observed behavior, formulate predictions for future experiments, and critically assess the quality of their data. Student achievement in these skills is assessed through written Lab Exercises and Post-Lab Assignments.

- **Employ quantitative concepts and mathematical methods:** This course develops a student's ability to *employ quantitative methods to examine a problem in the natural or physical world* (Gen Ed SLO #3a), as well as *apply the basic methods and thought processes of the scientific method for natural/physical science in a particular discipline* (Gen Ed SLO #3b).

  As a course in mechanics, essentially every element of this course involves quantitative methods and problem-solving. Quantitative tools such as algebra, trigonometry, and vectors are employed in every aspect of the course. Lecture presentation and textbook material train students in the following problem-solving skills: organizing information, visualizing and diagramming, recognizing concepts, strategizing solutions, combining mathematical relations, and assessing results. Weekly laboratory sessions allow students to actively apply the scientific method in order to explore physical phenomena and verify their predictions. For instance, in a lab on projectile motion students are tasked with predicting the distance a ball will travel when shot out of a launcher. Students determine the initial launch speed of the ball empirically, then utilize their measurement to model the ball's flight and ultimately predict the ball's landing position. Students then critique and refine their analysis based upon the accuracy of their result. While quantitative problem-solving is an ingredient in every aspect of the course, it is primarily assessed through multiple choice questions and free response problems posed on in-class quizzes and the final exam, as well as through written Lab Exercises.

Course materials

This course has 3 required course materials:

1. Textbook: The course textbook is *Physics, 5th Edition*, by James S. Walker.
2. Modified Mastering Physics access code: Every student must purchase an access code to Modified Mastering Physics for *Physics, 5th Ed.*, by Walker, and enroll in our course Mastering Physics site.
3. Calculator: You will need a stand-alone calculator with no internet or communication capabilities that can compute powers, trigonometric functions, and operate in scientific notation. You may not use a watch or mobile phone.

There are several options for purchasing the textbook and Mastering Physics access code – see the attached document Course materials for details.

Please note that prompt enrollment in Mastering Physics is a course requirement. The first assignment using Mastering Physics is due on **Tuesday, January 29**. Students who are not enrolled in Mastering Physics will not be offered quizzes or exams.

Your laboratory section may require additional materials; please consult your lab section syllabus.

Assessment

This course follows the official WCU scale for grades:

Grade	Quality Points	Percentage	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	0.00	<60	Failure

Refer to the WCU Undergraduate Catalog for description of NG (No Grade), W, Z, and other grades. Elements of the course will contribute to the course grade as follows:

Percent	Category
15%	Laboratory
5%	Videos
15%	Homework
45%	In-class quizzes (highest scores)
20%	Final exam

15% Laboratory: The lab grade is determined by the instructor of your lab section. Refer to your lab section syllabus for details.

5% Videos: Most weeks, there is a brief video assignment which is accessed on Mastering Physics. These videos are interactive and may contain multiple-choice questions or short tutorials. Video assignments are due **Tuesday evenings at 11:59 pm.** You will receive no credit for work submitted after the deadline. The course Mastering Physics site includes an easy-to-read assignment calendar – consult this calendar for details.

Each video assignment is worth about 2 points, and your total video grade for the course is simply: 100×(points earned)/(points available). Be aware that when an assignment includes interactive features you must complete these features in order to receive credit – you do not earn credit simply for playing the video.

15% Homework: Homework assignments are completed on Mastering Physics. There is a homework assignment corresponding to each lecture (e.g., Homework 3 covers material from Lecture 3). Assignments are due every week at **11:59 pm on Tuesday evening**. The course Mastering Physics site includes an easy-to-read assignment calendar – consult this calendar for details.

Each homework question is worth 1 point, and your total homework grade for the course is simply: 100×(points earned)/(points available). You are allowed **six attempts** to solve each problem for full credit; after these attempts the problem will close and you will receive partial or no credit. Any work completed prior to the deadline will be counted – you do not have to complete the assignment to receive partial credit.

Answers to homework problems are available on Mastering Physics shortly after the assignment deadline. Solutions are available to students during office hours.

45% In-class quizzes: There will be 6 in-class quizzes administered during the semester. The tentative dates for these quizzes are listed on the Course Schedule. Quizzes are "closed book": the only aids allowed are a stand-alone calculator and the course equation sheet. The equation sheet is updated throughout the term; the most recent version is available on D2L.

Quiz scores may be scaled ("curved") to conform to a standard distribution of grades. Failure to take a quiz results in a 0 score.

When calculating your course grade, I will "drop" your lowest quiz score(s). For students who attempt all 6 quizzes, I will drop your lowest 2 quiz scores. For students who fail to take one or more quizzes, I will drop only your 1 lowest score.

20% Final exam: The comprehensive final exam is scheduled for the time listed on page 1. The final exam is "closed book" in the same manner as the in-class quizzes. Final exam scores may be scaled ("curved") to conform to a standard distribution of grades. Failure to take the exam results in a 0 score. There is no final exam "exemption."

Grades for video and homework assignments may be viewed on the Mastering Physics grade book. Quiz grades are included with my written feedback on each quiz. Final exam scores and final laboratory grades will be posted on D2L once they are determined.

Although unlikely, I reserve the right to alter the assessment scheme in order to accommodate for unforeseen circumstances or to better serve the learning objectives of the course. Due dates of assignments as well as the dates of quizzes may change.

What I expect from you

The remainder of this syllabus is concerned with details. Before we get into all that, let me briefly summarize *what you're supposed to do* in this course. I expect you to do the following things:

1. In class: Come to every class on time and ready to be an active learner. Bring a calculator and the course equation sheet. Take notes, ask questions, participate. Do not bring distractions (for yourself or others) into the classroom.
2. After class: Read the assigned sections of the textbook. Give your best effort to complete the homework and videos. Start assignments early so that you have time to ask questions in class or at office hours. Do not cheat.
3. Laboratory: Read the lab chapter prior to your lab meeting. Attend lab and follow your instructor's directions. Complete the post-lab assignment.
4. Study for quizzes and the final exam.
5. Get help when you need it: Every student in this course will at some point struggle with the material. When you're stuck, unstick yourself by asking questions in class, coming to office hours, or contacting me.
6. Be respectful: Treat your lab partners, your peers in class, and me with respect.

Attendance policy

You are expected to attend all course meetings, including laboratory, lecture, and discussion sections. Attendance is taken at every class after the drop/add deadline. Obviously, if you are sick or unwell then you should not attend class. However, students who miss more than 8 classes by the end of 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 notes, text, and other course materials. You are welcome to seek assistance in 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).

Accommodation

If you require additional accommodation for any aspect of the course you must notify me in advance so that we can make arrangements. Depending on the accommodation, you may need to provide documentation.

- OSSD: If you have an ongoing medical condition which effects your ability to meet the course expectations then you should register with the Office of Services for Students with Disabilities (OSSD). **To receive accommodation you must submit your OSSD letter via D2L** (path: Assessments>Assignments>OSSD letters of accommodation).
- Acute medical conditions: If you have an acute medical condition which causes you to miss at least three consecutive school days then you may seek accommodation from the Office of the Assistant Dean of Students.
- Personal emergencies: Rarely, a personal emergency can arise which prevents a student from meeting course expectations. In such a rare circumstance I am happy to work with the student in order to make appropriate arrangements. I require documentation which verifies the emergency. If desired, the Office of the Assistant Dean of Students can act as a liaison and provide confidential verification of the emergency.

Policies on late or missed work

If you suspect that you will not be able to meet a course deadline you should notify me in advance so that we can discuss possible resolutions. The default policies on late and missed work are as follows:

- Videos: There are **no extensions** for videos.
- Homework: I **can** provide individual extensions on homework assignments, though I do not recommend it. Extensions are not automatic. You must request an extension at least 24 hours before the deadline so that I have time to change your deadline on Mastering Physics.
- Quizzes: Quizzes are not offered at alternate times, unless a quiz conflicts with an event which is recognized by the WCU Excused Absences Policy– see Excused Absences above. Failure to take a quiz results in a 0 score. Note that when calculating course grades I drop the lowest quiz score(s) – see Assessment above.
- Final exam: This course follows the WCU Final Exam Policy. The time and date of the final exam are set by the Registrar and can change. The final exam is not offered at alternate times. There is no final exam "exemption."

Electronic device policy

No electronic devices may be used in class. Devices such as mobile phones, smart watches, ipods, tablets, and laptop computers are not conducive to the kind of note-taking necessary for this course. Their use distracts the user and students around them. It's fine if you have these devices with you, but they must remain silent and out of sight. If I see or hear one of your devices then I will ask you to leave the class.

Course schedule

The attached Course Schedule provides a tentative schedule of course activities, including lecture topics, readings, assignment deadlines, lab activities, quizzes, and the final exam. This schedule may be updated in order to better meet our needs or accommodate unforeseen circumstances. An up-to-date Course Schedule is available on D2L (path: Content>Course syllabus).

You are expected to be available to attend lab every week of term. The tentative lab schedule (included on the Course Schedule) includes weeks without a lab, but that schedule may change.

The final exam time and date are arranged the by the Registrar's Office and can change. You should plan to be available the entire Final Exam Period (**May 6-11, 2019**).

D2L, email, and all that

- Course platforms: All course documents are maintained on the course D2L and Mastering Physics sites. I use the D2L announcement tool to make class-wide announcements. You are responsible for regularly checking these course platforms. I may not announce in class changes to course content on these platforms. As with all technology, these platforms can have glitches and service outages. For this reason, check these platforms frequently and do not leave assignments to the last minute.

- Email: I use email for individual correspondence and for time-sensitive class-wide communications. Except in the event of a technical failure or an emergency, I will only use university email (mine and yours) to correspond.

- Communication: All electronic communication should be written with appropriate language and etiquette. Please consult the guide here.

- Discussing grades: I am happy to discuss your progress in the course in person during office hours or by appointment. Due to limitations set by federal law (FERPA), I will not discuss grades over email.

Additional resources

- Physics tutoring:
  - Physics tutoring is available through the Learning Assistance & Resource Center. This service is free, but availability is limited.
  - In the past, WCU physics majors have offered free tutoring through the Society of Physics Students (SPS). If this occurs this semester, details will be announced in the first few weeks of term.
  - Some physics majors also offer one-on-one private tutoring for a fee. A list of available private tutors will be posted on D2L.

- Alternate texts:
  - *College Physics*, by Etkina et. al. This modern, algebra-based physics textbook is full of problem-solving strategies and approaches for conceptual understanding. This is an excellent complement to our textbook.
  - *Fundamentals of Physics*, by Halliday and Resnick. This was my introductory textbook and is still used today for the PHY 170–180 courses. The book occasionally uses calculus, but can be understood without it.
  - *MCAT Physics and Math Review*, by The Princeton Review. This is not a good text for learning physics, but it does provide an efficient review for the MCAT exam.

Academic integrity

Students are expected to follow all WCU rules and guidelines on academic integrity as described in the WCU Undergraduate Catalog. Here are a few relevant issues for this class:

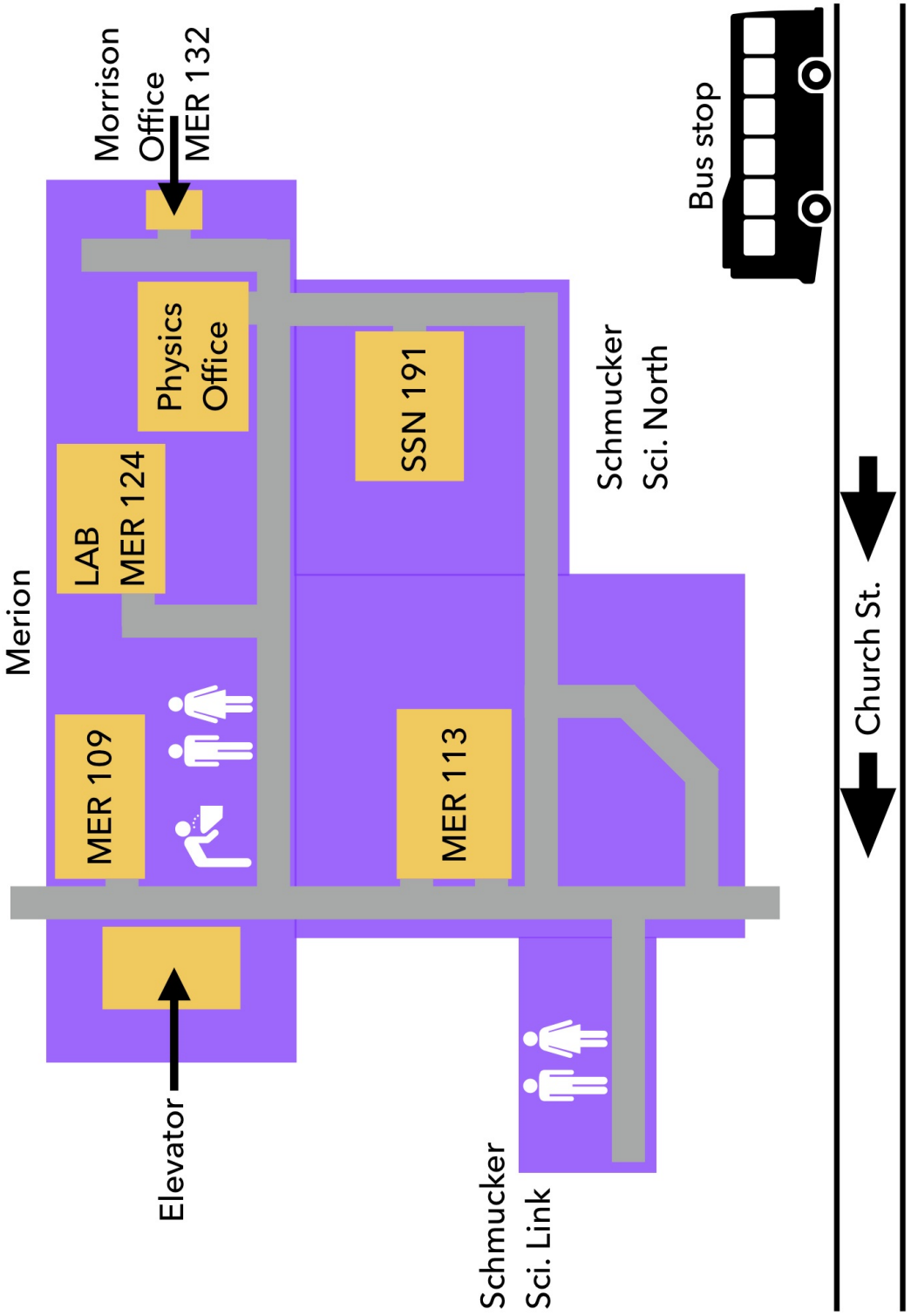
- Online platforms: D2L and Mastering Physics are extensions of the classroom and as such all WCU rules regarding student behavior apply on these platforms. Do not violate the copyrights of these sources or misrepresent your identity on these platforms.
- Collaboration: Students are encouraged to study together and collaborate on assignments. However, you should go through the process of solving each homework problem yourself. Submitting answers which you have not yourself obtained is fraud.
- Online resources: Students are welcome to use online resources to help them complete assignments. However, "resources" does not include specific solutions to assigned problems, whether found online or elsewhere. **Submitting answers which you have not yourself obtained is fraud.**

Students who violate WCU rules of academic integrity will receive a failing grade (F) in the course and an Academic Integrity Violation Report. These actions will adversely affect your academic career and could result in expulsion from the University.

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.

Map of the Physics Department



Statements Common to All WCU Undergraduate Syllabi

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. 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. 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 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. 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 Diversity, Equity, and Inclusion at https://www.wcupa.edu/_admin/diversityEquityInclusion/aboutUs.aspx.

EMERGENCY PREPAREDNESS

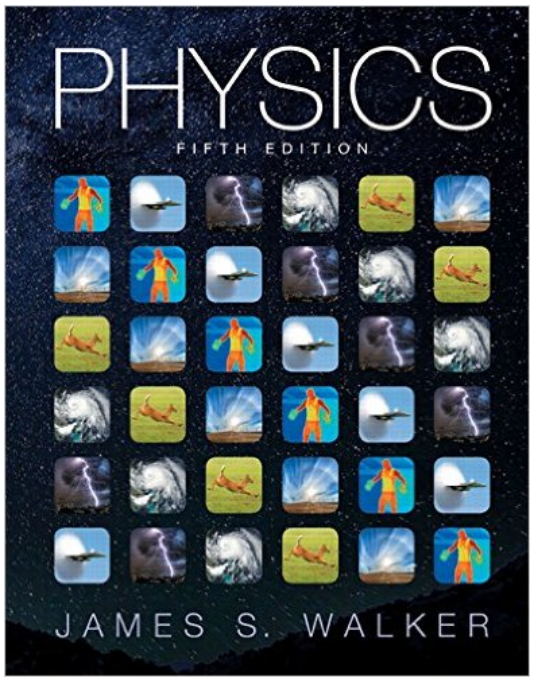
All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.

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.

Course Materials

PHY130 lecture has 3 required materials:



1. Textbook: The course textbook is *Physics, 5th Edition*, by James S. Walker.
2. Access code: Every student must purchase an access code to modified Mastering Physics for *Physics, 5th Ed.*, by Walker, and enroll in our course Mastering Physics site.
3. Calculator: You will need a standalone calculator with no internet or communication capabilities. You will want a calculator that can compute trigonometric functions, powers, and operate in scientific notation. You may not use a watch or your mobile phone.

There are several ways to acquire a textbook and purchase a modified Mastering Physics access code. Once you have an access code you may follow the directions at the end of this document to enroll in our Mastering Physics course site.

1. Purchase a textbook and access code together:

The following options are available on Amazon and at the WCU campus store:

a) **Physics 5/e hardback text & modified Mastering with etext (about $210).** This option includes a new hardback textbook, a 1-year access code to Mastering, and an etext of the textbook within Mastering Physics. To see this product on Amazon, click here: http://a.co/4sr2MW5.

b) **Physics 5/e loose-leaf text & modified Mastering with etext (about $170).** This option includes a loose-leaf text (designed for a 3-ring binder), a 1-year access code to Mastering, and an etext of the textbook within Mastering Physics. To see this product on Amazon, click here: http://a.co/33jv9QA.

2. Purchase only an access code:

If you already have a copy of the text or do not wish to buy a physical copy, you may purchase the following options directly from Mastering Physics:

c) **1-year modified Mastering with Physics 5/e etext (about $125).** This is a 1-year access code to Mastering, and an etext of the textbook within Mastering Physics.

d) **1-year modified Mastering, NO etext (about $70).** This is rarely a good option. This option gives you access to the course Mastering site so that you can complete homework assignments. However, you will not have access to the etext or other study resources.

3. Get temporary access to Mastering Physics:

If you wish to delay purchasing a Mastering Physics access code, you can obtain a temporary access code which will give you full access, for 14 days, to Mastering Physics as well as the *Physics* etext. This a good initial option for students who are unsure if they will take PHY130 this semester. After 14 days you will need to purchase an access code in order to continue in the course.

My advice:

The most popular option among previous PHY 130 students is option (c), which is also one of the most affordable. If you plan to take the MCATs, or if you foresee needing access to a physics book for years to come, then I recommend option (a).

Technical problems with Mastering Physics

If you encounter technical problems with Mastering Physics, in most cases it is due to your internet browser. It is recommended that you use the Mozilla Firefox browser. In order for Mastering Physics to function properly you must set your browser to allow pop-ups, cookies, and JavaScript. Please also note that while Mastering Physics will function on mobile devices, it is not ideal and you may experience problems. The Mastering Physics support site

Pearson Mastering Physics student support site

has excellent, detailed instructions concerning computer requirements, browser configurations, and other technical issues.

How to enroll in Mastering Physics

Pearson | Mastering | Physics

Student Registration Instructions

To register for WCUPA_PHY130_MORRISON_SPRING2019 :

1. Go to www.pearson.com/mastering .
2. Under Register, select **Student** .
3. Confirm you have the information needed, then select **OK! Register now** .
4. Enter your instructor's course ID: morrison83261 , and **Continue** .
5. Enter your existing Pearson account **username** and **password** to **Sign In** .

   You have an account if you have ever used a MyLab or Mastering product.

   » If you don't have an account, select **Create** and complete the required fields.
6. Select an access option.

   » Enter the access code that came with your textbook or that you purchased separately from the bookstore.
   » If available for your course,
   • Buy access using a credit card or PayPal.
   • Get temporary access. ← **Free 2 week trial!**
7. From the You're Done! page, select **Go To My Courses** .
8. On the My Courses page, select the course name **WCUPA_PHY130_MORRISON_SPRING2019** to start your work.

To sign in later:

1. Go to www.pearson.com/mastering .
2. Select **Sign In** .
3. Enter your Pearson account **username** and **password,** and **Sign In** .
4. Select the course name **WCUPA_PHY130_MORRISON_SPRING2019** to start your work.

To upgrade temporary access to full access:

1. Go to www.pearson.com/mastering .
2. Select **Sign In** .
3. Enter your Pearson account **username** and **password,** and **Sign In** .
4. Select **Upgrade access** for **WCUPA_PHY130_MORRISON_SPRING2019 .**
5. Enter an access code or buy access with a credit card or PayPal.

Course Schedule

Updated: January 17, 2019

- **Section 01** meets Monday (M), Tuesday (T), Wednesday (W), and Friday (F).
- **Section 04** meets Monday (M), twice on Wednesday (T and W), and Friday (F).
- **Assignments** are due on Tuesdays at 11:59 pm.
- **Topics** labeled with an "L" are presented through lecture, while topics labeled with "D" are presented as discussions.

Date	Day	Topic	Reading	Lab
WEEK	**1**			
01/21	M	**NO CLASS: MLK DAY**		
01/22	T	Intro; L1: Physical quantities	§1.1-1.5	NO
01/23	W	L2: Position, problem solving	§2.1, 1.6, 1.8	LAB
01/25	F	D1: Graphs	–	
WEEK	**2**			
01/28	M	L3: Velocity & speed	§2.2, 2.3	
01/29	T	L4: Acceleration	§2.4	
01/29	T	**Due: Homework 0, 1, 2, Video 1**		1a. Introduction
01/30	W	L5: Uniform acceleration	§2.5-2.7	& Data Analysis
02/01	F	D2: Uniform acceleration	–	
WEEK	**3**			
02/04	M	L6: Trigonometry & vectors	Suppl., §3.1-3.4	
02/05	T	L7: More vectors	–	
02/05	T	**Due: Homework 3, 4, 5, Video 2**		1b. Repeated
02/06	W	L8: Vector kinematics	§3.5, 4.1	Measurements
02/08	F	**QUIZ 1: 1d kinematics**	–	
WEEK	**4**			
02/11	M	L9: Projectile motion	§4.2-4.5	
02/12	T	D3: Projectile motion	–	
02/12	T	**Due: Homework 6, 7, 8, Video 3**		2. 1D
02/13	W	L10: Uniform circular motion	Suppl.	Kinematics
02/15	F	L11: Forces, Newton's laws	§5.1-5.3	
WEEK	**5**			
02/18	M	D4: Free body diagrams	§5.5	
02/19	T	L12: Weight, normal, Newton's 3rd	§5,4, 5.6, 5.7	
02/19	T	**Due: Homework 9, 10, 11, Video 4**		3. Free Fall
02/20	W	L13: Friction	§6.1	
02/22	F	**QUIZ 2: 2d kinematics**	–	

Date	Day	Topic	Reading	Lab
WEEK	**6**			
02/25	M	L14: Tension	§6.2-6.4	
02/26	T	L15: Centripetal forces	§6.5	
02/26	T	**Due: Homework 12, 13, Video 5**		4. Projectile
02/27	W	D5: Force workshop	–	Motion
03/01	F	Flex day	–	
WEEK	**7**			
03/04	M	L16: Springs & energy	§6.2	
03/05	T	L17: Work	§7.1, 7.3	
03/05	T	**Due: Homework 14, 15**		5. Newton's
03/06	W	L18: Work-energy theorem	§7.2	2nd Law
03/08	F	**QUIZ 3: Forces**	–	
03/11	M			
03/12	T			
03/12	T	**SPRING BREAK**		
03/13	W			
03/15	F			
WEEK	**8**			
03/18	M	L19: Potential energy	§8.1, 8.2	
03/19	T	L20: Conservation of energy	§8.3	
03/19	T	**Due: Homework 16, 17, 18, Video 6**		NO
03/20	W	D6: Conservation of energy	–	LAB
03/22	F	L21: Linear momentum	§9.1-9.3	
WEEK	**9**			
03/25	M	L22: Conservation of momentum	§9.4, 9.5	
03/26	T	D7: Conservation of momentum	–	
03/26	T	**Due: Homework 19, 20, 21, Video 7**		6. Energy
03/27	W	L23: Rotational kinematics	§10.1, 10.2	Conservation
03/29	F	Flex day	–	
WEEK	**10**			
04/01	M	L24: Rolling	§10.3, 10.4	
04/02	T	L25: Rot. KE, Moment of inertia	§10.5, 10.6	
04/02	T	**Due: Homework 22, 23, Video 8**		7. Momentum
04/03	W	L26: Torque	§11.1, 11.2	
04/05	F	**QUIZ 4: Energy & momentum**	–	

Date	Day	Topic	Reading	Lab
WEEK	**11**			
04/08	M	L27: Static equilibrium & balance	§11.3, 11.4	
04/09	T	D8: Rotation workshop	–	
04/09	T	**Due: Homework 24, 25, 26, Video 9**		8. Angular
04/10	W	L28: Angular momentum	§11.6, 11.7	Dynamics
04/12	F	L29: Simple harmonic motion	§13.1-2, 13.4	
WEEK	**12**			
04/15	M	L30: Applications of SHM	§13.5, 13.6	
04/16	T	L31: Waves	§14.1, 14.2	
04/16	T	**Due: Homework 27, 28, 29, Video 10**		9. Springs
04/17	W	L32: Sound, Doppler effect	§14.4, 14.6	& Oscillations
04/19	F	**QUIZ 5: Rotation**	–	
WEEK	**13**			
04/22	M	L33: Interference	§14.7	
04/23	T	L34: Standing waves	§14.8	
04/23	T	**Due: Homework 30, 31, 32, Video 11**		10. Standing
04/24	W	D9: Wave graphs	–	Waves
04/26	F	L35: Static fluids	§15.1-15.3	
WEEK	**14**			
04/29	M	L36: Buoyancy & Archimedes	§15.4, 15.5	
04/30	T	D10: Archimedes workshop	–	
04/30	T	**Due: Homework 33, 34, 35**		NO
05/01	W	Flex day	–	LAB
05/03	F	**QUIZ 6: Oscillations & Waves**	–	
WEEK	**15**			
05/05	S	**Due: Homework 36**		
05/06	M	Review for final exam	–	
05/07	T	No class	–	
05/08	W	**FINAL EXAM Sec. 04, 1-3 pm**	–	
05/10	F	**FINAL EXAM Sec. 01, 8-10 am**	–	