

# PHYSICS 130: GENERAL PHYSICS I

WEST CHESTER UNIVERSITY  
SPRING 2018



## SYLLABUS

UPDATED: January 16, 2018

### INSTRUCTOR

Prof. Ian A. Morrison  
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### OFFICE HOURS

Day	Time
Tuesday	1:30–3:00 pm
Wednesday	10:30 am–12:30 pm
Thursday	1:30–3:00 pm

Additional office hours by appointment.

### COURSE SECTION DETAILS

SECTION 130-01:

	Day	Time	Location
Class:	Monday, Wednesday, Friday	9:00–9:50 am	Merion 112
	Tuesday	3:20–4:20 pm	Merion 112
Final exam:	Wednesday, May 9	8:00–10:00 am	Merion 112

### COURSE DESCRIPTION

*Physics 130: General Physics I* is an algebra-based introductory course in physics. 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 pre-calculus 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 Monday, January 29.

## TIME COMMITMENT

This is a 4-credit hour course. There are 4 hours of lecture/discussion and 2 hours of laboratory each week. In addition, this course requires 4-8 hours of reading, assignments, and studying outside of scheduled class time each week.

## STUDENT LEARNING OUTCOMES

PHY 130 is an approved course in the WCU General Education program, 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, angular momentum, harmonic motion, and wave phenomena.
3. **Analyze mechanical systems** through visualization, modeling, algebra, as well as diagrammatic and graphical techniques.
4. Combine 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:** In this course, effective communication involves the ability to *communicate physical concepts in plain language* and *describe a system in the language of kinematics*. In class, peer instruction exercises and group discussion give students the opportunity to relate physical concepts in their own words. Laboratory activities, performed in groups of 2-3 students, provide further practice describing physical systems with brevity and precision. Effective communication of physical concepts 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:** In this course, critical thinking most often takes the form of *recognizing and applying physical concepts*. Understanding of physical concepts is developed through interactive pre-lecture assignments, lecture, in-class “concept quizzes”, and homework problems. Each of these elements reinforces the practice of identifying the physical concepts in action in a given system, and then reasoning

the consequences of these concepts. Recognition and application of physical concepts is primarily assessed through multiple choice and short-answer questions on in-class quizzes and the final exam. A typical exam question might ask students to determine the result of an experiment given only a conceptual description of the apparatus, no quantitative information.

Critical and analytical thinking is also developed through *laboratory analysis*. Laboratory exercises demand that students think critically when making predictions, troubleshooting experiments, and assessing the accuracy of experimental results. Student achievement in these skills is assessed through Lab Exercises and Post-Lab Assignments.

- **Employ quantitative concepts and mathematical methods:** This course develops *quantitative problem solving methods* of broad applicability. Lecture 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. Specific problem-solving “recipes” exhibiting these skills are developed throughout the term. Through in-class problem-solving exercises, pre-lecture assignments, and homework problems, students have the opportunity to practice problem-solving on over 300 problems in a low-risk setting. While problem-solving is an ingredient in every aspect of the course, it is primarily assessed through multiple choice and free response questions posed on in-class quizzes and the final exam. Free response questions expect students to employ the problem-solving techniques listed above in order to solve multi-step quantitative problems.

## 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. You will want a calculator that can compute trigonometric functions, powers, and operate in scientific notation. You may not use your 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 **Thursday, January 25**. Students

who are not enrolled in [Mastering Physics](#) will not be offered quizzes, exams, or other course materials.

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
7.5%	Pre-lecture assignments
17.5%	Homework
40%	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.

7.5% **PRE-LECTURE ASSIGNMENTS:** Most lectures include a brief pre-lecture assignment which is accessed and submitted on [Mastering Physics](#). Pre-lecture assignments may contain multiple-choice questions based on the reading, an instructional video, or an interactive tutorial. **Each pre-lecture assignment is due immediately before the corresponding lecture.** For Monday, Wednesday, and Friday classes the pre-lecture assignment is due at 8:59am, while for Tuesday class it is due at 3:19pm. 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 pre-lecture assignment is worth about 2 points, and your total pre-lecture grade for the course is simply:  $100 \times (\text{points earned}) / (\text{points available})$ . Be aware that when an assignment includes videos or interactive features you must complete these features in order to receive credit – you do not earn credit simply for opening the assignment.

17.5% **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 Thursday 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:  $100 \times (\text{points earned}) / (\text{points available})$ . 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.

40% **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 exams. 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.

Grades for pre-lecture assignments and homework assignments may be viewed on the [Mastering Physics](#) gradebook. 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.

## WHAT I EXPECT FROM YOU

The remainder of this syllabus is concerned with important but boring 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 these seven things:

1. **BEFORE CLASS:** Read the assigned sections of the textbook prior to lecture and complete the pre-lecture assignment.
2. **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.
3. **AFTER CLASS:** Give your best effort to complete the homework. Start assignments early so that you have time to ask questions in class or at office hours. Do not cheat.
4. **LABORATORY:** Read the lab chapter prior to your lab meeting. Attend lab and follow your instructor's directions. Complete the post-lab assignment.
5. **STUDY FOR QUIZZES AND THE FINAL EXAM.**
6. **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.
7. **BE RESPECTFUL:** Treat your lab partners, your peers in class, and me with respect.

## UNIVERSITY-SANCTIONED EVENTS

If you are unable to perform an aspect of the course due to a University-Sanctioned Event you must notify me in advance so that we can make arrangements. **Official documentation verifying your participation in the event must be submitted via D2L** (path: Assessments>Assignments>Absence letters for University-Sanctioned Events).

## 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

This is a fast-paced course with frequent quizzes and many low-risk assignments. It is best to keep pace with the class, even if that means an occasional dropped assignment.

- **PRE-LECTURE ASSIGNMENTS:** There are **no extensions** for pre-lecture assignments.
- **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 a University-Sanctioned Event (see [University-Sanctioned Events](#) 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.

## ATTENDANCE POLICY

**You are expected to attend all course meetings, including laboratory, lecture, and discussion sections.** Attendance is taken at every class. 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 will 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.

Your attendance is excused for a University-Sanctioned Event, provided you submit official documentation – see [University-Sanctioned Events](#) above.

## ELECTRONIC DEVICE POLICY

**No electronic devices may be used in class.** Devices such as mobile phones, 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 activities for class and lab. The due dates of pre-lecture and homework assignments are listed on the course [Mastering Physics](#) calendar. These schedules may be updated in order to better meet our needs or accommodate unforeseen circumstances. An up-to-date [Course Schedule](#) is available on [D2L](#).

You are expected to be available to attend lab every week of term. The tentative lab schedule (included on the [Course Schedule](#)) includes a few weeks without labs, 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 8-11, 2018).

## 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 homework assignments to the last minute.
- **EMAIL:** I use email for individual correspondence and for time-sensitive class-wide communications. You are responsible for regularly accessing, reading, and responding to course communications sent to your university email account. 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 guides [here](#) and [here](#).
- **DISCUSSING GRADES:** I am always 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 weekly group 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.
- *Physics for Scientists and Engineers*, by Knight. This book provides dozens of step-by-step recipes for solving classes of problems. Very useful, but also rather technical.
- *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 still 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 and can be used to fill in subjects which are on the MCAT but which are not covered in the PHY 130–140 sequence.

- ONLINE REFERENCES: In addition to [Mastering Physics](#), you may also wish to consider researching course material on:

- [Wikipedia](#), [HyperPhysics](#), or [Wolfram MathWorld](#),
- Youtube videos. Khan Academy is a student favorite.

If you find yourself studying without your calculator, note that between google and [Wolfram Alpha](#) you can perform essentially any computation you need to complete your homework.

## 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 solutions which you have not yourself obtained is fraud.
- **ONLINE RESOURCES:** Students are welcome to use online resources to help them complete assignments. A list of commonly-used resources is included above. However, “resources” does not include specific solutions to assigned problems, whether found online or elsewhere. **Submitting solutions which you have not yourself obtained is fraud.**

Students who violate WCU rules of academic integrity will receive a failing grade (F or Z) 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.

## UNIVERSITY STATEMENTS

UPDATED: JUNE 2016

The following required statements are common to undergraduate course syllabi. Further information regarding university-wide academic policies may be found in the [WCU Undergraduate Catalog](#) as well as your respective major department handbook.

### 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 [Physics Department Undergraduate Handbook](#), the [WCU 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 [Office of 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](tel:610-436-2564), their fax number is 610-436-2600, their email address is [ossd@wcupa.edu](mailto:ossd@wcupa.edu), and their website is at [www.wcupa.edu/ussss/ossd](http://www.wcupa.edu/ussss/ossd).

### EXCUSED ABSENCES POLICY FOR UNIVERSITY-SANCTIONED EVENTS

Students are advised to carefully read and comply with the excused absences policy for university-sanctioned events contained in the [WCU Undergraduate Catalog](#). In particular, please note that the “responsibility for meeting academic requirements rests with the student,” that this policy does not excuse students from completing required academic work, and that professors can require a “fair alternative” to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

## REPORTING INCIDENTS OF SEXUAL VIOLENCE

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator, [Ms. Lynn Klingensmith](#). The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at the webpage for the [Office of Social Equity](#) at [http://www.wcupa.edu/\\_admin/social.equity/](http://www.wcupa.edu/_admin/social.equity/).

## EMERGENCY PREPAREDNESS

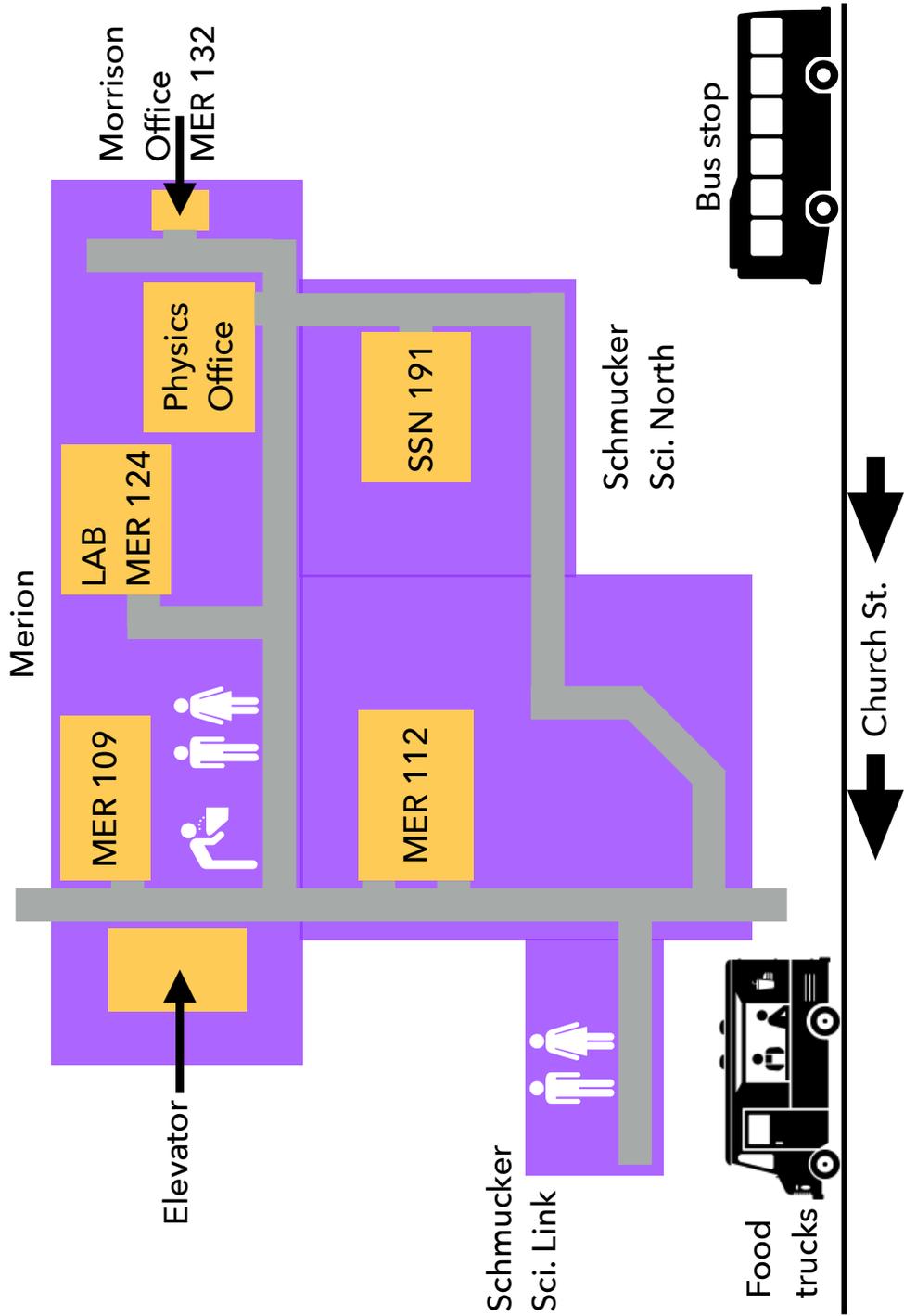
All students are encouraged to sign up for the University's free [WCU ALERT](#) service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit [www.wcupa.edu/wcualert](http://www.wcupa.edu/wcualert). To report an emergency, call the [Department of 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.

# MAP OF THE PHYSICS DEPARTMENT

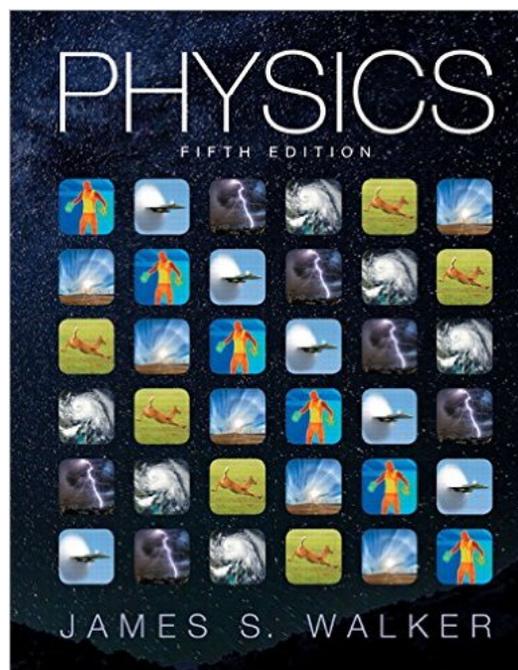
## PHY130 Map of the Physics Department



## COURSE MATERIALS

PHY130 has 3 required course 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 stand-alone 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 your mobile phone.



There are several ways to purchase the textbook and 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 at the [WCU campus store](#):

- a) **Physics 5/e hardback text & modified Mastering with etext (\$239.55)** This option includes a new hardback textbook, a 1-year access code to Mastering, and an etext of the textbook within [Mastering Physics](#). The [WCU campus store](#) price is slightly cheaper than mainstream online textbook sellers.
- b) **Physics 5/e loose-leaf text & modified Mastering with etext (\$185.60)** 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](#).
- c) **Volume 1 of Physics 5/e hardback text & modified Mastering with etext (\$199.30).** This is rarely a good option. It includes a hardback textbook containing only the chapters covered in PHY130, a 6-month access code to Mastering, and an etext of the full textbook within [Mastering Physics](#). **This option is only for students who will NOT take PHY140.** If you purchase this option, then later decide to take PHY140,

you will need to purchase Volume 2 as well as a new Mastering access code, and you will end up paying much more than the options above.

## 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 a Modified [Mastering Physics](#) access code directly from the [Mastering Physics](#) website with one of these packages:

- d) **1-year modified Mastering with Physics 5/e etext (\$115.95)** This is a 1-year access code to Mastering, and an etext of the textbook within [Mastering Physics](#).
- e) **1-year modified Mastering, NO etext (\$68.95)** 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:

Most PHY130 students take PHY140 as well, and for this reason I believe the best choice for most students is option (a). The hardback textbook makes for comfortable reading and is durable enough to survive a year of use. If you want a more affordable option then I recommend option (d).

## TECHNICAL PROBLEMS WITH MASTERING PHYSICS

If you encounter technical problems with [Mastering Physics](#), in most cases it is due to your internet 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



### Student Registration Instructions

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#### To register for **PHY130\_Spring2018\_Morrison** :

1. Go to [www.pearson.com/mastering](http://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: **morrison20634** , 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.
7. From the You're Done! page, select **Go To My Courses** .
8. On the My Courses page, select the course name **PHY130\_Spring2018\_Morrison** to start your work.

#### To sign in later:

1. Go to [www.pearson.com/mastering](http://www.pearson.com/mastering) .
2. Select **Sign In** .
3. Enter your Pearson account **username** and **password**, and **Sign In** .
4. Select the course name **PHY130\_Spring2018\_Morrison** to start your work.

#### To upgrade temporary access to full access:

1. Go to [www.pearson.com/mastering](http://www.pearson.com/mastering) .
2. Select **Sign In** .
3. Enter your Pearson account **username** and **password**, and **Sign In** .
4. Select **Upgrade access** for **PHY130\_Spring2018\_Morrison** .
5. Enter an access code or buy access with a credit card or PayPal.

## COURSE SCHEDULE

UPDATED: January 16, 2018

Date	Day	Topic	Reading	Lab
<b>WEEK 1</b>				
01/22	M	L0: Intro; L1: Physical quantities	§1.1-1.5	1a. Introduction & Data Analysis
01/23	T	L2: Position, problem solving	§2.1, 1.6, 1.8	
01/24	W	D1: Graphs	–	
01/25	R	<b>Due: Homework 0, 1, 2</b>	–	
01/26	F	L3: Velocity & speed	§2.2, 2.3	
<b>WEEK 2</b>				
01/29	M	L4: Acceleration	§2.4	1b. Repeated Measurements
01/30	T	L5: Uniform acceleration	§2.5-2.7	
01/31	W	D2: Uniform acceleration	–	
02/01	R	<b>Due: Homework 3, 4, 5</b>	–	
02/02	F	L6: Trigonometry & vectors	Suppl., §3.1-3.4	
<b>WEEK 3</b>				
02/05	M	<b>QUIZ 1: 1d kinematics</b>	–	2. 1D Kinematics
02/06	T	L7: More vectors	–	
02/07	W	L8: Vector kinematics	§3.5, 4.1	
02/08	R	<b>Due: Homework 6, 7, 8</b>	–	
02/09	F	L9: Uniform circular motion	Suppl.	
<b>WEEK 4</b>				
02/12	M	L10: Projectile motion	§4.2-4.5	3. Free Fall
02/13	T	D3: Projectile motion	–	
02/14	W	L11: Forces, FBDs	§5.1, 5.5	
02/15	R	<b>Due: Homework 9, 10, 11</b>	–	
02/16	F	L12: Newton's laws	§5.2-5.4	
<b>WEEK 5</b>				
02/19	M	<b>QUIZ 2: 2d kinematics</b>	–	4. Projectile Motion
02/20	T	L13: Weight & normal forces	§5.6, 5.7	
02/21	W	L14: Friction	§6.1	
02/22	R	<b>Due: Homework 12, 13, 14</b>	–	
02/23	F	D4: Force workshop	–	
<b>WEEK 6</b>				
02/26	M	L15: Tension	§6.2-6.4	5. Newton's 2nd Law
02/27	T	L16: Gravity	§12.1, 12.2	
02/28	W	L17: Centripetal forces	§6.5	
03/01	R	<b>Due: Homework 15, 16, 17</b>	–	
03/02	F	L18: Springs	§6.2	

Date	Day	Topic	Reading	Lab
<b>WEEK 7</b>				
03/05	M	<b>QUIZ 3: Forces</b>	–	
03/06	T	L19: Work	§7.1, 7.3	NO
03/07	W	L20: Work-energy theorem	§7.2	LAB
03/08	R	<b>Due: Homework 18, 19, 20</b>	–	
03/09	F	Flex day	–	
<b>SPRING BREAK</b>				
03/12				
03/13				
03/14				
03/15				
03/16				
<b>WEEK 8</b>				
03/19	M	L21: Potential energy	§8.1, 8.2	
03/20	T	L22: Conservation of E	§8.3	NO
03/21	W	D5: Conservation of E	–	LAB
03/22	R	<b>Due: Homework 21, 22</b>	–	
03/23	F	L23: Linear momentum	§9.1-9.3	
<b>WEEK 9</b>				
03/26	M	L24: Conservation of $\vec{P}$	§9.4	
03/27	T	L25: Collisions	§9.5-9.7	6. Energy
03/28	W	D6: Collisions	–	Conservation
03/29	R	<b>Due: Homework 23, 24, 25</b>	–	
03/30	F	L26: Rotational kinematics	§10.1, 10.2	
<b>WEEK 10</b>				
04/02	M	<b>QUIZ 4: Energy &amp; momentum</b>	–	
04/03	T	L27: Rolling	§10.3, 10.4	7. Impulse
04/04	W	L28: Rot. KE, Moment of inertia	§10.5, 10.6	& Momentum
04/05	R	<b>Due: Homework 26, 27, 28</b>	–	
04/06	F	L29: Torque	§11.1, 11.2	
<b>WEEK 11</b>				
04/09	M	L30: Static equilibrium & balance	§11.3, 11.4	
04/10	T	D7: Torque workshop	–	8. Angular
04/11	W	L31: Angular momentum	§11.6, 11.7	Dynamics
04/10	R	<b>Due: Homework 29, 30, 31</b>	–	
04/13	F	L32: Simple harmonic motion	§13.1, 13.2, 13.4	

Date	Day	Topic	Reading	Lab
<b>WEEK 12</b>				
04/16	M	<b>QUIZ 5: Rotation</b>	–	9. Springs & Oscillations
04/17	T	L33: Applications of SHM	§13.5, 13.6	
04/18	W	L34: Waves	§14.1, 14.2	
04/19	R	<b>Due: Homework 32, 33, 34</b>	–	
04/20	F	L35: Sound, Doppler effect	§14.4, 14.6	
<b>WEEK 13</b>				
04/23	M	L36: Interference	§14.7	10. Standing Waves
04/24	T	L37: Standing waves	§14.8	
04/25	W	D8: Wave graphs	–	
04/26	R	<b>Due: Homework 35, 36, 37</b>	–	
04/27	F	L38: Static fluids	§15.1-15.3	
<b>WEEK 14</b>				
04/30	M	<b>QUIZ 6: Oscillations &amp; Waves</b>	–	11. Archimedes Principle
05/01	T	L39: Buoyancy & Archimedes	§15.4, 15.5	
05/02	W	D9: Archimedes workshop	–	
05/03	R	<b>Due: Homework 38, 39</b>	–	
05/04	F	Review for final exam	–	
<b>WEEK 15</b>				
05/07	M	<b>FINAL EXAM: 8:00-10:00 am</b>		
05/08	T			
05/09	W			
05/10	R			
05/11	F			