Physics 130-01,02: General Physics I

West Chester University – Spring 2017

COURSE SYLLABUS

Updated: January 19, 2017

Instructor

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Office hours

Day	Time
Monday	10:30-11:30 am
Wednesday	10:30-11:30 am, 2:00-3:00 pm
Friday	10:30-11:30 am, 2:00-3:00 pm

Additional office hours are available by appointment on Mondays, Wednesdays, and Fridays.

Course section details

Section	Time	Days	Location	Final Exam
130-02	8:00-8:50 am	MWF	Merion 112	Monday, 5/8, 8:00-10:00 am
130-01	9:00–9:50 am	MWF	Merion 112	Wednesday, 5/10, 8:00-10:00 am

Link to course WileyPlus site:

link: www.wileyplus.com/class/555047 course id: 555047

Course description

Physics 130: General Physics I is an algebra-based introductory course in physics. Topics covered include kinematics, forces, energy, momentum, rotational motion, fluids, oscillations, wave motion, and thermodynamics. In less technical language, we will cover the mathematical description of motion (kinematics), how forces give rise to changes in motion (dynamics), and a number of applications within canonical physical systems.

A laboratory portion of this course provides a hands-on exploration of the physical laws and concepts discussed in class.

This course is part of a two-semester algebra-based introduction to physics. This sequence is 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 introductory sequence is appropriate for your program.

Prerequisites

This course uses pre-calculus mathematics, including algebra, trigonometry, and basic graphing skills, on a daily basis.

Student learning outcomes

This course (PHY130) is an approved general education course in the Sciences (see the WCU Undergraduate Catalog) and as such meets the following general education goals:

- General Education Goal #2: Ability to employ quantitative concepts and mathematical methods. (Secondary Goal of Science General Education Courses)
- General Education Goal #3: Ability to think critically and analytically. (Primary Goal of Science General Education Courses)

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 in 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 as well as formulate **quantitative predictions** for physical experiments.

These goals will be met through the following activities:

- Class presentation and readings introduce the mathematical tools, physical concepts, and problem-solving strategies needed for physical analysis.
- Collaborative in-class exercises and homework assignments develop and practice analysis and problem-solving in a low-risk setting.
- Laboratory sessions and demonstrations connect course material to real-life physical systems.
- Frequent quizzes and exams will test for gaps in understanding as well as provide critical feedback.

Course materials

- Textbook: The course textbook is

  Physics, 10th Ed.
  by Cutnell and Johnson
  ISBNs: 1118899202, 9781118899205

  The textbook is available new or used in various formats. There are also several previous editions which might be more affordable, but you will be responsible for translating between editions. It may be purchased at the WCU campus store, though I recommend you check online sellers for the best price.

- Online platform: Every student must purchase a registration code for the WileyPlus companion to *Physics, 10th Ed.*, by Cutnell and Johnson. We use this platform to complete homework assignments. This site also contains an electronic version of the textbook (which cannot be downloaded) as well as additional studying resources. If you plan to purchase the textbook (new or used), it will likely be most affordable to purchase the textbook and WileyPlus registration code as a package. These packages are available at the WCU campus store or online. If you only need a registration code this can be purchased directly from the WileyPlus website.

  You will use the registration code to enroll in our WileyPlus course site. Instructions for how to do this are available on D2L. Here is a direct link to our course WileyPlus site:

  link: www.wileyplus.com/class/555047 course id: 555047

  If you are unsure if you plan to remain in the course, you can create a free account with a 14 day grace period.

  The first assignment requiring WileyPlus is due on **Thursday, January 26**.

- "Clicker": Every student must have a Turning Technologies RF remote and valid Turning Account License. I recommend the most basic remote, Turning Technologies ResponseCard RF LCD, but other models are fine. The WCU campus store offers new clicker/license pairs; alternatively, if you already have a clicker you can purchase a license from the Turning Technologies website. I require that you use a remote – you may not use your phone or computer as a clicker.

  You will need to link your remote to your personal account on D2L. There is an instructional video on the course D2L site which describes how to accomplish this. You may also wish to consult the clicker information available at the WCU Digital Corner.

  We will begin using clickers in class on **Monday, January 30**.

- Calculator: For exams 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.

- Lab notebook: Available at the WCU campus store; however, it may be more affordable at BookFactory. The most basic lab notebook model is fine; here is a link:

  Large Economy Scientific Grid 96 Page Notebook

  You may use the same notebook in PHY 140.

Assessment

This course follows the official WCU scale for grades (see the WCU Undergraduate Catalog):

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	

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%	Reading quizzes
5%	In-class participation
10%	In-class quizzes (2 highest scores)
15%	Homework
30%	In-class exams (2 highest scores)
20%	Final exam

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

5% READING QUIZZES: Each lecture has an associated reading quiz on D2L which must be completed **prior to 8:00 am on the day of lecture**. The reading quizzes are typically multiple choice, and will contain 1-3 questions, each worth 1 point. Your total reading quiz grade is simply (points earned)/(points available)×100. You are allowed only one attempt for each question (they are usually easy).

5% IN-CLASS PARTICIPATION: Your participation grade is determined by your contribution to class discussions as well as your interaction through clicker questions. For the clicker questions, you will be graded on participation only, not on the accuracy of your answers.

10% IN-CLASS QUIZZES: There will be occasional in-class quizzes, with about 4 in total. Quizzes will be advertised in advance, and tentative dates for quizzes are listed on the course schedule. As the semester progresses, quizzes may become take-home exercises. **When calculating your course grade, I will drop your lowest 2 quiz grades.**

15% HOMEWORK: Homework assignments are accessed and submitted on WileyPlus. There will be two assignments per week, due **Sunday and Thursday evenings at 11:45 pm** – see the assignment schedule for details.

Each homework question on WileyPlus is worth 1 point, and your total homework grade for the course is simply: (points earned)/(points available)×100. You are allowed **five** attempts to solve each problem for full credit; after these attempts the problem will close and you will receive partial or no credit.

Solutions to all homework problems are available on WileyPlus immediately after the assignment is due.

30% IN-CLASS EXAMS: There will be 3 exams administered in class during the semester. Exams 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.

Both in-class and final exam scores may be scaled ("curved") to conform to a standard distribution of grades. Failure to take an exam results in a 0 score. **When calculating your course grade, I will drop your lowest exam score.** Thus, each of your most successful exams is worth 15% of your course grade.

20% FINAL EXAM: The comprehensive final exam is tentatively scheduled for the time listed on page 1. This date is also listed on the course schedule. The final exam is "closed book" in the same manner as the in-class exams. Failure to take the exam results in a 0 score.

I will use the D2L grade-book feature to post grades for participation, reading quizzes, in-class quizzes, and exams. I will not post homework grades on D2L as these are available on WileyPlus. I also will not post laboratory grades as these are determined by your laboratory instructor.

Policy on late or missed work

In general, deadlines are strict and late work will not be accepted. This is a fast-paced course with frequent quizzes and exams and many low-risk assignments. It is best to keep pace with the class, even if that means an occasional dropped assignment. In particular:

- There is no way to make up for missed class participation.
- I will not give individual extensions on reading quizzes.
- I will not give quizzes or exams at alternate times. Note that when calculating course grades I drop the lowest two quiz scores as well as the lowest exam score.
- I **can** provide individual extensions on homework assignments, though I do not recommend it. You must request an extension at least 24 hours before the deadline so that we have time to discuss, and so that I have time to change your deadline on WileyPlus.

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 necessary, the Office of the Assistant Dean of Students can act as a liaison and provide confidential verification of the emergency.

Attendance policy

Attendance in class is required. Attendance is measured through the classroom response system ("clickers"). You may have three absences without penalty; after that, for each class you miss you will lose 1% from your course grade, up to a maximum of 10%.

There can be technical glitches with the clickers. I will periodically post your attendance record on D2L. Please let me know of any errors.

Your attendance is excused for a documented University-Sanctioned Event or personal emergency. Illness, traffic, etc., may prevent you from coming to class, but these are not excused absences.

Electronic device policy

The only personal electronic devices that may be used in class are tablet-style computers which have a stylus. Other electronic devices such as mobile phones, ipods, and laptop computers are not conducive to the kind of note-taking necessary for this course. It's fine if you have these devices with you, but they must remain out of sight. If I see these devices then I will ask you to leave the class, and I will subtract from your participation grade.

Additional course policies

- D2L: All course documents are maintained on the course D2L site. I use the D2L announcement tool to make class-wide announcements.
- Lecture notes: Lecture notes are posted on D2L in advance of class. You may wish to print these notes and bring them with you to class.
- Email: Except in the event of a technical failure or an emergency, I will only correspond electronically via university email (mine and yours).
- Missed classes: If you miss a class it is your responsibility to make up the missed learning opportunity by reviewing the lecture notes. You are welcome to seek assistance in office hours, but I cannot reproduce an entire lecture outside of class.
- University-Sanctioned Events: If you will not be able 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**.
- 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.

  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). If you suffer an acute 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. Letters of accommodation from these offices must be **submitted via D2L**.
- Carrying forward a previous laboratory grade: If you have previously taken PHY 130 and failed the course, but passed the laboratory portion, then you may apply your previous lab grade this semester. To do this you must (i) have your previous lab instructor send me an email stating your final lab grade, and (ii) notify your current lab instructor that you are withdrawing from their lab section. Both your previous and current lab instructors must approve of the action. This is not a back-up option; you must arrange this at the start of the term.
- Inappropriate behavior: Rarely, we have to deal with students who misbehave in class or send inappropriate emails. After the first instance I will issue a warning. After the second instance the student will lose their full participation grade (5% of the course grade). If there is a third instance the student will be removed from the course.

Expectations

You are responsible for your learning (and your grade!) in this course, not me. Here is what I expect from you:

- Course platforms: Regularly check the course platforms on D2L and WileyPlus. I may not announce in class changes to course content on these platforms. As with all technology, these platforms can have glitches and unscheduled service outages. For this reason, check these platforms frequently and do not leave homework assignments to the last minute.
- Email: Regularly access, read, and respond to course communications sent to your university email account.
- Textbook reading: I expect you to complete the assigned textbook reading listed on the course schedule **prior** to class.
- Assignments: I expect you to complete every assignment. In previous courses I have taught at WCU the vast majority students (over 90%) have completed every assignment.
- In class: Attend class on time prepared to be an active learner. Bring your functioning clicker. Interact, ask questions, take notes.
- When confused: Every student struggles at some point in this course. When you become stuck I expect you to initiate the process of getting unstuck. Ask questions in class, attend office hours, correspond with me via email, ask your lab instructor, confer with your peers, obtain a tutor.
- Lab: Perform all tasks expected of you by your laboratory instructor. Lab does not meet during weeks without a scheduled lab; **however**, this schedule is subject to change, and is particularly sensitive to snow days. You should plan to be available **every week** during your lab section time.
- Final Exam Period: 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 9-12, 2017).

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 WileyPlus 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.

- Clickers: Do not misrepresent your identity by using another student's clicker.
- 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 on page 9. 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) 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.

Additional resources

- Physics tutoring: Physics tutoring is available through the Learning Assistance & Resource Center. In the past, peer tutoring has also been available from SPS (the Society of Physics Students). If SPS tutoring becomes available this semester I will make an announcement.
- Alternate texts: For many reasons, I do not like our official course textbook. The texts below are superior, and I recommend you give them a look.
  - *College Physics*, by Etkina et. al. This modern, algebra-based physics textbook is full of problem-solving strategies and approaches for conceptual understanding. I believe this is the best text for the typical WCU student and I highly recommend it.
  - *Fundamentals of Physics*, by Halliday and Resnick. This book is used for the PHY 170–180 courses. As far as presentation of the physics, this is my favorite textbook. The book occasionally uses calculus, but can still be understood without it.
  - *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.
  - *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 WileyPlus, you may also wish to consider researching course material on:

- Wikipedia
- HyperPhysics
- 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.

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 finals of the semester in which this course is held.

Course schedule

Attached to this syllabus is a tentative schedule of course activities. The precise course trajectory may be altered to better meet our needs as well as to accommodate unforeseen circumstances. I will maintain an up-to-date course schedule on D2L.

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.

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 visit them at 223 Lawrence Center. The OSSD hours of Operation are Monday – Friday, 8:30 a.m. – 4:30 p.m. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is ossd@wcupa.edu, and their website is at www.wcupa.edu/ussss/ossd.

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/.

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 Schedule

Updated: January 19, 2017

This schedule is a living document; the most recent version is available on the course D2L site.

#	Date	Day	Topic	Reading
1	01/23	M	Course intro; dimensions & units	1.1-1.3
2	01/25	W	Position, velocity	Syllabus, 2.1, 2.2
3	01/27	F	Acceleration; problem-solving	2.3
4	01/30	M	Graphical integration; 1d kinematics	2.7
5	02/01	W	1d kinematics recipe; free fall	2.4-2.6
–	02/03	F	**QUIZ**	–
6	02/06	M	Triangles, vectors	1.4-1.8
7	02/08	W	2d kinematics	3.1
8	02/10	F	Projectiles; projectile recipe	3.2, 3.3
9	02/13	M	Uniform circular motion	5.1, 5.2
10	02/15	W	Relative velocity & equilibrium	3.4
11	02/17	F	Newton's 1st & 2nd; force recipe	4.1-4.4
–	02/20	M	**EXAM 1: Ch. 1,2, 3.1-3.3, 5.1, 5.2**	–
12	02/22	W	Gravity	4.6, 4.7
13	02/24	F	Normal force; Newton's 3rd	4.5, 4.8
14	03/27	M	Friction	4.9
15	03/01	W	Tension	4.10-4.12
16	03/03	F	Centripetal forces; **QUIZ**	5.3-5.7
17	03/06	M	Work & kinetic energy	6.1, 6.2
18	03/08	W	Gravitational PE; conservation	6.3-6.6
19	03/10	F	Variable forces; springs	6.9, 10.1, 10.3
–	03/13	M	SPRING BREAK	
–	03/15	W	SPRING BREAK	
–	03/17	F	SPRING BREAK	
20	03/20	M	Systems; the cm frame	7.5
21	03/22	W	Linear momentum, impulse, conservation	7.1-7.2
22	03/24	F	Rockets, collisions	7.3-7.4
–	02/27	M	**EXAM 2: Ch. 4-6, 10.1, 10.3**	–
23	03/29	W	Rotational kinematics	8.1-8.3
24	03/31	F	Rotation and translation; rolling	8.4-8.6
25	04/03	M	KE of rotation; torque	9.1-9.5
26	04/05	W	More torque; work in rotation	9.1-9.5
27	04/07	F	Angular momentum; **QUIZ**	9.6

#	Date	Day	Topic	Reading
28	04/10	M	Static fluids	11.1-11.6
29	04/12	W	Dynamic fluids	11.7-11.10
30	04/14	F	Simple harmonic motion	10.1, 10.3
31	04/17	M	Applications of SHM	10.2, 10.4
32	04/19	W	Mathematical description of waves	16.1, 16.2, 16.4
33	04/21	F	Wave speed; sound; Doppler effect	16.3, 16.5-16.6, 16.9
–	04/24	M	**EXAM 3: Ch. 7-9,11**	–
34	04/26	W	Superposition & interference	17.1-17.3
35	04/28	F	Standing waves	17.5-17.6
36	05/01	M	Temperature & heat	12.1-12.2, 12.4-12.7
37	05/03	W	Thermodynamics I	TBA
38	05/05	F	Thermodynamics II; **QUIZ**	TBA
–	05/08	M	**FINAL EXAM – Section 02**	–
–	05/10	W	**FINAL EXAM – Section 01**	–

Laboratory Schedule

Lab does not meet during weeks without a scheduled lab; **however**, this schedule is subject to change, and is particularly sensitive to snow days. You should plan to be available **every week** during your lab section time.

Week	Topic
01/23	Measurements
01/30	Basic motion
02/06	–
02/13	Free fall
02/20	Projectiles
02/27	–
03/06	Forces
03/13	SPRING BREAK
03/20	Energy
03/27	Momentum
04/03	Angular dynamics
04/10	–
04/17	Springs
04/24	Fluids
05/01	Standing waves

Assignment Schedule

All textbook problems are submitted via WileyPlus.

#	Due date	Day	Details
0	01/26	R	**Complete on D2L**
1	01/26	R	L1: Ch. 1: 2, 6, 10, 11
2	01/29	S	L2: Ch. 2: 1, 4, 5, 8, 12
3	02/02	R	L3: Ch. 2: 14, 17, 19, 20 L4: Ch. 2: 65, 67, X07, X15
4	02/05	S	L5: Ch. 2: 26, 27, 28, 32, 36
5	02/09	R	L5: Ch. 2: 44, 48, 55, 57, 58 L6: Ch. 1: 19, 23, 34, 39, 46
6	02/12	S	L7: Ch. 1: 28, 66, Ch. 3: 3, 9, 10
7	02/16	R	L8: Ch. 3: 12, 13, 15, 37, 41 L9: Ch. 5: 1, 2, 11
–	02/19	S	**Extra:** Ch. 3: 18, 20, 21, 22, 46
8	02/23	R	L10: Ch. 3: 52, 53, 56, 62