# West Chester University

## Physics 100-07: Elements of Physical Science Spring 2020

**Course Overview**: We interact with the physical world all the time—when we walk, when we drive, as we work, even when we rest. Our body is itself a physical object that we use to go where we want and operate the machines and tools that we want. But what of things like cars, TVs, skateboards, and cell phones: do they operate and move according to the same set of "rules" which describe the motion of our bodies? What are those rules, anyway? And how could we use knowledge of such rules to make better predictions about what will happen when we interact with the physical world around us? We will attempt to answer these questions during the course of our studies in PHY 100.

In PHY 100, we will study the application of the science of physics to various aspects of our everyday lives. Our ultimate goal is to understand how scientific models of the physical world can enrich our understanding of everyday processes. We will begin by considering what a model of the physical world consists of, and learn the mathematical language by which we can ask questions of and receive quantitative answers from the natural world. From there, we will study the modern physical theories of motion and rotation which allow us to make sense of how and why things in the world around us move. Lastly, we will turn our attention to electricity and electrical circuits to get a feel for how the many electronic devices we use on a daily basis work. Throughout the course, we will develop and build analytical reasoning and problem solving skills which are widely applicable to our modern life.

**Course Credit:** This 3 credit course is an approved General Education Science Distributive Course.

**Course Requirements**: This course has no prerequisites. However, we will be doing some basic algebra at the high school math level; I will assume that you have done this sort of math before, though it may be a few years since you've seen it or used it. We will also be drawing and interpreting diagrams, which I will assume you have some experience doing (but may not have practiced in a while). A good deal of time in this class will be spent extending our existing body of knowledge to new situations in order to understand them; I will assume that you have experience doing this.

Meeting Times: Tuesdays and Thursdays from 9:30AM to 10:45 AM, in Merion Science Center room 112

#### **Required Course Materials:**

- Physics: A Conceptual World View, 7th Ed., by Kirkpatrick & Francis (Thompson, Text: Brookes/Cole, 2009 or 2010)
- A stand-alone calculator which is not part of an internet-accessible personal electronic device
- A paid account with Top Hat: the Interactive Teaching Platform (classroom response system)

#### Instructor Information:

Dr. Michelle A. Caler <u>office</u>: Merion Science Center room 135 <u>office hours</u>: Mondays, Wednesdays, and Fridays from 10:00AM to 11:00AM Tuesdays from 11:00AM to 1:00PM Thursdays from 2:00PM to 3:00PM **Office hours are available by appointment for students with an ongoing conflict with my scheduled hours**. <u>email</u>: mcaler@wcupa.edu office phone: 610-436-2320

webpage: This course has a D2L webpage. Homeworks, this syllabus, and all other related course materials will be posted to this webpage. Please let me know if you are unable to access it. Being able to access the D2L website will be critical to student success in this course. **Course Goals:** The ultimate goal of PHY 100 is for you to gain an appreciation for how ideas from the science of physics influence our everyday lives. One of the ways we will accomplish this goal is by building up an understanding of how and why various physical phenomena occur, emphasizing those processes which we encounter regularly. During the course of our studies, we will develop a qualitative understanding of our current physical model of the natural world; additionally, we will learn how to make quantitative predictions using the mathematical laws which form its foundation. In particular, we will examine modern physical theories of linear motion, rotational motion, momentum, energy, and electricity. While I hope that you will gain a good understanding of these topics and how they explain physical phenomena that we see every day, our larger goal in studying them is to illustrate how the methods and ideas of science inform our understanding of the natural world. More specific course goals for PHY 100 include:

- develop insight into how physical laws can explain various processes and phenomena which are observed on a daily basis;
- extend an existing body of knowledge to previously unencountered situations (i.e., simple experiments or simplified "real-life" scenarios) in order to predict a qualitative outcome
- develop the information organization skills needed to solve complex quantitative problems
- develop strategies which permit the solution of complex quantitative problems

Cooperative in-class activities such as "Voting Opportunities," practice problems, and "Prediction Opportunities", as well as assigned homework problems, will contribute to students' achievement of the above Course Goals. Course Goals will be assessed on exams.

As we work toward meeting our course goals, I will be emphasizing the ability to reason with and work with concepts and equations rather than strict fact memorization or complicated mathematics. (We will need to memorize some terms, though.) In doing so, we will learn analytical reasoning skills, how to make connections between concepts, and how to communicate our reasoning to others. We will also be making quantitative predictions about phenomena, which *does* require some basic mathematical ideas. These ideas include, but are not limited to, simple algebra, proportionality, scaling, and working with powers of 10. **DO NOT PANIC** if it's been awhile since you've seen these mathematical terms! We will develop them as we go through the course.

**Course General Education Goals:** PHY 100 is an approved General Education Science Distributive Course. As such, it is designed to help students meet the following general education goals:

#### General Education Goal 1: Communicate Effectively

Students will work on effective communication by *Demonstrating comprehension of and ability to explain information and ideas accessed through reading.* I will assess our progress towards effectiveness towards this goal via observation of student discussions during class participation activities.

We will work on expressing oneself effectively in common college-level written forms. But I explicitly <u>do not</u> mean essays. We will be working developing our ability to combine quantitative arguments and writing into coherent narratives leading to a conclusion. This particular written form which we will call the "problem set" has a long and storied tradition. *Progress will be assessed via exams and assignments.* 

#### General Education Goal 2: Think Critically and Analytically

Students will work on *reaching sound conclusions based on a logical analysis of evidence*. In particular we will work on using the scientific method, a method for reaching sound conclusions by analyzing evidence. We will also work on our ability to use quantitative reasoning to reach conclusions using measured quantities as evidence. Progress towards this goal will be assessed via exams and homework.

#### General Education Goal 3: Employ quantitative concepts and mathematical methods

Students will work towards this general education goal by employing quantitative methods to examine a problem in the natural or physical world. That problem is the description and prediction of the motion of objects. We will employ quantitative methods, read as "doing math" to solve some problems arising from kinematics. Progress towards this objective will be monitored via homework and exams.

Students will also apply the basic methods and thought processes of the scientific method for natural/physical science as appropriate to the discipline of Physics. In particular, we will as a class analyze demonstrations. To do this we will utilize a wide range of tools including graphical analysis. Progress towards this objective will be monitored via exams, homework, and observation of in-class demonstrations.

**Grading:** Class participation: 15% Homework: 20% Exams: 45% Cumulative Final Exam: 20%

**Class Participation and Attendance**: We will be using the <u>Top Hat</u> classroom response system in class. Via this platform, you will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, or your personal computer. To ensure that you are able to submit responses throughout the entire class period, please make sure that your personal device is sufficiently charged before each class, and that Top Hat is the only app open on your smartphone or tablet. Top Hat requires a paid subscription; a full breakdown of all available subscription options can be found at <u>https://tophat.com/pricing/</u>; purchasing directions can be found at <u>https://success.tophat.com/s/article/Student-Purchasing-Top-Hat-Products2</u>. I am *requiring* that you buy a paid subscription to the Top Hat system. Please pay for and activate your account, which includes entering your first and last name into the Top Hat account area, by Thursday January 30<sup>th</sup> before the start of class. Starting on that date, I will be using Top Hat in class to assign class participation points. More information on Top Hat can be found in the <u>Top Hat Overview</u> within the Top Hat Success Center, which outlines how you will register for a Top Hat account and provides a brief overview to get you up and running on the system. Our course website on Top Hat can be found at <u>https://app.tophat.com/e/081992</u>, course join code 081992.

Class participation points will be earned by responding with your smartphone, tablet, or computer via the Top Hat application (or website, if using a personal computer) to questions that I ask during my PowerPoint presentations. These questions will consist of (but are not necessarily limited to) "Voting Opportunities," "Prediction Opportunities," Discussions, and numerical entry problems. I reserve the right to introduce ways in addition to these to earn class participation credit. All class participation questions will be worth one point; the exact number of class participation points each class is worth will vary from class to class. Please note that, at times, I will ask you to talk to a neighbor and respond again to a question using Top Hat; that re-asking of the question **will count** as a new class participation point, so if you do not respond to a re-asked question you will miss out on one class participation point for that class. Note carefully that you <u>DO NOT</u> have to answer response questions correctly in order to get credit for them: you just have to attempt them. It is in your best interest to do your best to get the correct answers, though, so don't just choose a response at random when questions come up. Give them your best go.

In order to earn class participation points, *YOU* must present in class submitting responses via the Top Hat system using *YOUR* personal device. If I catch *ANYONE* answering questions via Top Hat while not actually present in the classroom, this will be construed as cheating, and **AT THE MINIMUM** you will lose **ALL** class participation points for the entire semester. To enforce this policy, I will be using the "Attendance" feature in Top Hat to verify in-class presence. I reserve the right to introduce additional ways to verify in-class presence as circumstances warrant. Further, I have a zero-tolerance policy for ANYONE who authorizes a classmate to use their Top Hat account for them in class. If I catch *ANYONE* using multiple Top Hat accounts during a class, this will also be construed as cheating, and *ALL* involved parties will lose ALL class participation points for the semester.

You **MUST** be present in class responding via the Top Hat system in order to receive class participation credit. Thus, I am expecting you to attend all scheduled classes for the entire scheduled time. I do understand that on occasion something unforeseen will pop up and prevent you from attending class; therefore, at the end of the term I will drop three (3) days of class participation points. Any additional unexcused absences will result in ZERO class participation points for those dates. If you miss class due to an excused absence, it is <u>IT IS YOUR RESPONSIBILITY</u> to contact me by email to arrange a way to make up the class participation points that you missed. My excused absences policy follows the <u>Excused Absence Policy</u> as described in the <u>West Chester University Undergraduate Catalog</u>. If you are absent, whether excused or unexcused, <u>IT IS YOUR RESPONSIBILITY</u> to get the notes you missed from a classmate—**including** notes on any quantitative problems worked in class—and to learn of any important announcements that were made.

As with any technology, problems with the Top Hat classroom response system can pop up unexpectedly. Thus, in the event that unforeseen circumstances arise, I reserve the right to change details about how class participation credit is awarded on a particular day as circumstances warrant it. You will be notified of any such changes both in class and on D2L. I also reserve the right to increase the number of dropped days of class participation due to unforeseen circumstances.

**Homework:** All homework will be posted and submitted online through the "Homework" portion of the "Assessments" section of this course's D2L webpage. There will be TEN (10) homeworks assigned over the course of this semester. <u>YOU ARE RESPONSIBLE FOR CHECKING D2L AND KEEPING UP WITH HOMEWORKS</u>: this means checking to see that an assignment has been posted, knowing when it is due, and ensuring that it is completed before the deadline. To help you with this, I have included a column in the class schedule at the end of this syllabus that tells you **WEEK BY WEEK** what homeworks will be posted, when they will be posted (date/time), and when they will be due (date/time). If the course schedule is adjusted from what appears at the end of this document, it will be posted to D2L and there will be an announcement made in class. An announcement will also be placed on D2L indicating that the course schedule has been updated. Life can get very busy during a semester, so it can be hard to remember to log in to do homeworks even when you know the dates that they are being posted and will be available. Thus, you may wish to set up pre-timed reminders to check in on our course's D2L site. <u>I will not always remind you in class about homeworks</u>! It is **YOUR RESPONSIBILITY** to remember to do them.

You may re-do a homework as often as you like before it is due; I will keep only your highest score for my gradebook. But regardless of how many times you attempt one, **homeworks are due on the due date and time indicated on the class schedule and D2L**. No late homeworks will be accepted, <u>no exceptions</u>. This is because homework solutions will be posted shortly after the homework's due time. At the end of the semester, *I will drop your lowest homework grade*. This way, it's not a big deal if you miss one assignment. But if not doing homework becomes a habit, your grade will suffer come the end of the semester.

If you have a question or a computer problem, you must notify me at least 48 hours before the homework due date. Plan on your internet access and/or computer failing at the *worst possible time*, so <u>have a go at the homework at</u> <u>some point before the day it is due</u>. Report any problems with D2L ASAP by calling 1-866-832-1851 or visiting the D2L help desk in the Anderson Hall, Room 120 (610-436-3350, option 1).

I encourage you to discuss the homework problems with each other, but *the work you do on homeworks must be your own.* (See the Academic Integrity statement on page 6 of this syllabus.) I also encourage you to discuss and review course material with your classmates. But do be sure to study and think about the material on your own, because your classmates cannot help you on exams.

As with any technology, problems with online D2L assessments can pop up unexpectedly, and for this reason I reserve the right to change details about how they are conducted. I also reserve the right to modify homework frequency, the number of homeworks assigned, homework assign-dates, and homework due-dates to reflect unforeseen circumstances. You will be notified of any such changes both in class and on D2L.

**Exams**: There will be four in-class exams given over the course of the semester. The dates of these exams are:



The range of chapters each exam covers is given in the class schedule, which can be found at the end of this syllabus. If the class schedule is adjusted from what appears at the end of this document, it will be posted to D2L and there will be an announcement made in class. An announcement will also be placed on D2L indicating that the course schedule has been updated. Make sure to check D2L regularly to ensure that you have an up-to-date class schedule. *You* will be responsible for knowing what chapters will be covered on an exam, and when that exam is. If you have a letter of accommodation from the OSSD, it is *your responsibility* to contact me with the letter prior to any exams where it will be used. You are also responsible for arranging accommodation at least a week prior to any exam date.

YOUR LOWEST EXAM GRADE WILL BE DROPPED. Thus only your three highest test grades will be counted. <u>THERE</u> <u>WILL BE NO MAKE-UP EXAMS GIVEN</u>. You CANNOT take an exam early or late. If you miss an exam, you will receive a zero for it, and it will be used as your dropped exam. Exceptions will be made ONLY for absences due to the <u>Excused</u> <u>Absences Policy</u> as described in the <u>West Chester University Undergraduate Catalog</u>. In the event that you are unable to make an exam due to some Excused Absence, you must contact me **BEFORE** the exam, you must provide some form of written documentation, and we will arrange for you to take the exam in a manner consistent with its integrity. If you have ANY questions or concerns about this particular point, please come talk to me and get clarification BEFORE it is too late! Tests will consist of approximately 10–25 multiple-choice questions. Some tests **MAY** contain one open-ended problem; any open-ended problem appearing on an exam will be designed to be similar to example and practice problems done in class. A constant curve will be applied to an exam if the class average drops below 75% to increase it to this value. The scope of each test (with the exception of the final) is limited to the chapters listed in the class schedule at the end of this syllabus; however, even though earlier material is not explicitly tested it may still appear on an exam. **YOU HAVE BEEN WARNED**!

Tests will be <u>closed book</u> and <u>closed notebook</u>. However, I will give you one sheet of equations to use during the exam. This equations sheet will be **the only aid** allowed to you during exams, with the exception of a stand-alone calculator (as described below). All other written and electronic aids are <u>strictly forbidden</u>. I will post on D2L the equations sheet that I will give you for an exam at least 24 hours prior to the exam time, so that you can see what will be on the sheet. You are permitted to use 1 stand-alone calculator (i.e., a calculator that is *not* part of an iPod/iPad, cell phone, smartphone, tablet PC, Kindle, etc.) during exams. If I catch you using an internet-accessible personal electronic device as a calculator during an exam, I will take your exam and you will get a zero on it. No exceptions. If you will be using a graphing calculator, I must personally see you clear its memory before you receive your exam (i.e., remove any files which may be stored on the device). I will NOT bring extra calculator for exams. After each exam, I will return to you the answer sheet which contains your responses to the multiple-choice questions. If the exam asked an open-ended question, your response to that question will also be returned. I will write your overall exam grade at the top of the multiple-choice answer sheet. I will hold the copies of the multiple-

choice exam questions in my office; you can make an appointment any time you like to come look at the multiplechoice exam questions. **Final Exam:** The final exam for this course will be given on Tuesday, May 5<sup>th</sup> from 8:00 AM–10:00 AM. This is the time school and by the University registrar for our final exam. The final will be sumulative, and it is mandatory. It will

time scheduled by the University registrar for our final exam. The final *will be cumulative*, and *it is mandatory*. It will consist of approximately 35–45 multiple choice questions and 1 open-ended question. Missing the final exam will result in a zero for the exam unless EXTREME circumstances apply. Your final exam grade *cannot* be counted as your dropped exam score. There is no final exam "exemption."

**Extra Credit:** I am offering *one* extra credit opportunity this semester. It is entirely optional; you are not required to do it. It will involve making observations of physical theories at work in your daily life over the course of the semester. Details of the project will be provided during the first class period. If you want to do the extra credit project, you MUST tell me so **by email** by **Friday January 31st at 5PM**, and include a sample observation in that email. No extra credit sign-ups will be accepted after this date. Projects will be due on April 30th at the start of class. Successful completion of an extra credit project will boost your overall course grade by two percentage points.

**Teaching Style:** I will be using Microsoft PowerPoint slides a great deal when going over course material in class; when example problems come up, I will use the white board to work through them. I will try to write big enough so that everyone can see, but if you do have trouble seeing what I write please move to the front of the room. Before the class period on which we will begin covering a chapter, I will post to D2L modified copies of the PowerPoint slides I will use in class, in the so-called "structured note-taking" style. There WILL be blank areas in the modified lecture slides where material is intentionally omitted. The slides I put up on D2L are **NOT** meant to take the place of your own personal note-taking. YOU will be responsible for that. I provide these modified slide copies to give you the text for in-class activities that we will do, so that you do not need to worry about copying them down and can instead concentrate on the activities themselves. I will also leave plenty of room on the modified slides for you to write down key equations, words, and other ideas so that you'll remember them later. Please note carefully that the modified slides I post will NOT contain solutions to example problems done in class, nor will they contain each and every word seen on the in-class slides. If you want notes on these things, you'll need to take them for yourself as we go through the material in class. I will do my best to engage you interactively with the material during class time. Activities may include, but are not necessarily limited to, conceptual questions to be discussed with a neighbour, practice problems, "Voting "Prediction Opportunities," interactive problem-solving sessions, and interactive lecture Opportunities."

demonstrations. As mentioned above, your responses to some of these items will count as class participation credit. I hope that these activities both enhance your learning and help make class a little more exciting for you. The cooperative in-class activities listed above, in addition to assigned homeworks and exams, are designed to contribute to your achievement of the general education goals and course goals that this class has been designed to meet.

**Excused Absences Policy:** Students are advised to carefully read and comply with the <u>excused absences</u> <u>policy</u>, including absences for university-sanctioned events, contained in the <u>WCU Undergraduate Catalog</u>. 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.

**Intellectual Property Statement:** The instructor for this course utilizes copyrighted materials under the "Freedom and Innovation Revitalizing 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 copyright protected by the instructor, including, but not limited to, lectures, course discussions, course notes and supplementary materials posted or provided to students authored by the instructor, assessment instruments such as quizzes and exams, and PowerPoint presentations. No recording, copying, storage in a retrieval system, or dissemination in any form, whether electronic or other format, by any means of the intellectual property of the instructor, either in whole or in part, is permitted without the 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 in the semester in which this course is held.

Links and references to on-line resources provided by the instructor may lead to other sites. The instructor does not sponsor, endorse or otherwise approve of any information appearing in those sites, nor is responsible for the availability of, or the content located on or through, external sites. Apart from materials used in accordance with the Fair Use Act, the instructor takes no responsibility for material that is otherwise offered at web sites and makes no warranty that such material does not infringe any third party rights. However, should any of this type of material be present and this fact is brought to the attention of the instructor, they will remove references to it from course materials.

**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.

Ye Olde Technology Policy: You are permitted to use laptops, cell phones, smart phones, iPhones, iPads, and tablet PCs in class in order to make use of the Top Hat classroom response system. However, you are NOT ALLOWED to use cell phones for social networking or gaming during class. If I catch you using a personal electronic device inappropriately during class, *I will take 5 points off of the nearest exam grade*! NO EXCEPTIONS. Try to make it a rule that, when you are in class, the Top Hat application is the only application open on your personal device. I do not permit audio and/or video recording of my classes. However, I do understand that recordings of class and/or use of certain personal electronic devices may be required to accommodate certain disabilities. Terms of use in these cases can be discussed with me on an individual basis. See the topic "Students with Disabilities" below.

**Tutoring**: Tutoring for PHY 100 is offered by the <u>Learning Assistance Resource Center</u> (LARC), 224 Lawrence Center, phone number 610-436-2535. LARC tutoring is free of charge, but you must sign up at the beginning of the semester. See the following website for more information: <u>https://www.wcupa.edu/universityCollege/larc/</u>. A list of physics majors offering tutoring will also be made available on the physics department website.

**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 <u>Office of Services for Students with Disabilities</u> (OSSD), please contact the OSSD which is located at 223 Lawrence Center. The OSSD hours of Operation are Monday – Friday 8:30 a.m. – 4:00 p.m. Their phone number is 610-436-2564, their fax number is 610-436-2600, and their email address is <u>ossd@wcupa.edu</u>. See the following website for more information: <u>https://www.wcupa.edu/universityCollege/ossd/default.aspx</u>.

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 automatic failure and removal from this course.

For questions regarding Academic Dishonesty, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to their major department's handbook, the <u>West Chester University</u> <u>Undergraduate Catalog</u>, <u>the Rams Eye View</u>, or the <u>University Web Site</u>. Please understand that improper conduct in any of these areas will not be tolerated and may result in immediate ejection from the class.

**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 <u>Office for Diversity</u>. <u>Equity, and Inclusion at https://www.wcupa.edu/\_admin/diversityEquityInclusion/</u>.

**Withdrawal Notice**: A syllabus constitutes a contract between student and instructor. Your continued enrollment after the January 28<sup>th</sup> drop deadline indicates that you accept all instructional practices, requirements, and policies. If you find the standards to which you will be held accountable too rigorous, if you are unable to *reliably* access the internet to log on to D2L and/or Modified Mastering Physics, or if an ongoing scheduling conflict prevents you from attending class regularly and punctually, you must officially withdraw (grade "W") through the Registrar's Office by the March 24<sup>th</sup> course withdrawal deadline. You are responsible for checking your grades before this withdrawal deadline so you aren't surprised by your standing as the end of the course approaches. If you would like, you can come to my office hours to get a rough estimate of your grade as it stands at the moment.

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

### CLASS SCHEDULE

This is the tentative schedule; I will try to follow it as closely as possible. Please note that we may at times get ahead of or behind this schedule. I will post any changes to this schedule to D2L, and announce in class that an updated schedule has been posted.

IT IS YOUR RESPONSIBILITY to make sure that you have an up-to-date class schedule. It is also your responsibility to read the assigned selections from the text before you arrive in class. I will not always cover in class everything that is contained in the readings.

Week	Homework	<b>Class Meeting</b>	Торіс	Readings Due
1	HW #1 posted on D2L at 8AM on January 21	January 21	Welcome, Course Intro Building a World View / What is Physics	_
		January 23	What is Physics / What "Counts" as Physics / Measurement	Ch. 1: "First Grade," "On Building a World View," "Bode's Law," "Measurements," AND Ch. 11: "Building Models"
2	HW#1 DUE on January 29 at 10PM	January 28	Scales / Speed / Displacement	Ch. 1: "Sizes: Large and Small;" Ch. 2: "Average Speed," "Images of Speed," and "Speed with Direction"
	HW #2 posted on D2L at 8AM on January 30	January 30	Velocity / Acceleration the Kinematic Equations of Motion	Ch. 2: "Speed with Direction" and "Acceleration"
3	HW#2 DUE on February 7 at 10PM	February 4	Free-fall / Adding Vectors	Ch. 2: "Starting with an Initial Velocity" and "A Subtle Point;" Ch. 3: "Adding Vectors"
		February 6	Force / Tour de Force Newton's Laws	Ch. 3: "An Early Explanation," "The Beginnings of Our Modern Explanation," "Weight," "Friction," "Newton's First Law," and "Newton's Second Law"
4	HW #3 posted on D2L at 8AM on February 10	February 11	Newton's Laws / Mass vs. Weight	Ch. 3: "Newton's First Law," "Newton's Second Law," and "Mass and Weight"
		February 13	Newton's Laws / Free-Body Diagrams	Ch. 3: "Newton's Third Law" and "Free-Body Diagrams"
5	HW#3 DUE on February 17 at 10PM	February 18	EXAM I	CHAPTERS 1—3
	HW #4 posted on D2L at 8AM on February 20	February 20	Uniform Circular Motion	Ch. 4: "Circular Motion," "Acceleration Revisited," and "Acceleration in Circular Motion"

6	HW#4 DUE on February 28 at 10PM	February 25	Projectile Motion	Ch. 4: "Projectile Motion"
	HW #5 posted on D2L at 8AM on February 28	February 27	Projectile Motion / the Road to Gravity	Ch 4: "Launching an Apple into Orbit;" Ch. 5: "The Concept of Gravity," "Newton's Gravity," and "The Law of Universal Gravitation"
7	HW #6 posted on D2L at 8AM on March 3	March 3	Newton's Gravity / Gravitational Fields Tides / Momentum	Ch. 5: "The Law of Universal Gravitation," "The Value of G," and "The Field Concept;" Ch. 6: "Linear Momentum"
	HW#5 DUE on March 6 at 10PM	March 5	Momentum / Impulse	Ch. 6: "Linear Momentum" and "Changing an Object's Momentum"
		March 10	Spring Proply (	Nonal Hava sama funl
		March 12	Spring break!	None! Have some fun!
8	HW#6 DUE on March 18 at 10PM	March 17	Systems / the Law of Conservation of Linear Momentum / Collisions	Ch. 6: "Changing an Object's Momentum," "Conservation of Linear Momentum," and "Collisions"
		March 19	EXAM II	CHAPTERS 4—6
9	HW #7 posted on D2L at 8AM on March 24	March 19 March 24	<b>EXAM II</b> What is Energy / Kinetic Energy / Work	CHAPTERS 4–6 Ch. 7: "What is Energy?" "Energy of Motion," and "Changing Kinetic Energy,"
9	HW #7 posted on D2L at 8AM on March 24	March 19 March 24 March 26	<b>EXAM II</b> What is Energy / Kinetic Energy / Work Gravitational Potential Energy The Law of Conservation of Mechanical Energy	CHAPTERS 4–6 Ch. 7: "What is Energy?" "Energy of Motion," and "Changing Kinetic Energy," Ch. 7: "Forces That Do No Work," "Gravitational Potential Energy," and "Conservation of Mechanical Energy"
9	HW #7 posted on D2L at 8AM on March 24 HW#7 DUE on April 1 at 10PM	March 19 March 24 March 26 March 31	EXAM II         What is Energy / Kinetic Energy / Work         Gravitational Potential Energy         The Law of Conservation of Mechanical Energy         The Law of Conservation of Mechanical Energy         Power	CHAPTERS 4–6 Ch. 7: "What is Energy?" "Energy of Motion," and "Changing Kinetic Energy," Ch. 7: "Forces That Do No Work," "Gravitational Potential Energy," and "Conservation of Mechanical Energy" Ch. 7: "Conservation of Mechanical Energy" and "Power"
9	HW #7 posted on D2L at 8AM on March 24 HW#7 DUE on April 1 at 10PM HW #8 posted on D2L at 8AM on April 1	March 19 March 24 March 26 March 31 April 2	EXAM IIWhat is Energy / Kinetic Energy / WorkGravitational Potential EnergyThe Law of Conservation of Mechanical EnergyThe Law of Conservation of Mechanical EnergyPowerRotational Motion / Torque	CHAPTERS 4–6Ch. 7: "What is Energy?" "Energy of Motion," and "Changing Kinetic Energy,"Ch. 7: "Forces That Do No Work," "Gravitational Potential Energy," and "Conservation of Mechanical Energy"Ch. 7: "Conservation of Mechanical Energy" and "Power"Ch. 7: "Conservation of Mechanical Energy" and "Power"Ch. 8: "Rotational Motion," and "Torque"
9 10 11	HW #7 posted on D2L at 8AM on March 24 HW#7 DUE on April 1 at 10PM HW #8 posted on D2L at 8AM on April 1 HW#8 DUE on April 8 at 10PM	March 19 March 24 March 26 March 31 April 2 April 7	EXAM IIWhat is Energy / Kinetic Energy / WorkGravitational Potential EnergyThe Law of Conservation of Mechanical EnergyThe Law of Conservation of Mechanical EnergyPowerRotational Motion / TorqueExtended Free-Body DiagramsStatic Equilibrium	CHAPTERS 4–6Ch. 7: "What is Energy?" "Energy of Motion," and "Changing Kinetic Energy,"Ch. 7: "Forces That Do No Work," "Gravitational Potential Energy," and "Conservation of Mechanical Energy"Ch. 7: "Conservation of Mechanical Energy" and "Power"Ch. 7: "Conservation of Mechanical Energy" and "Power"Ch. 8: "Rotational Motion," and "Torque"Ch. 8: "Center of Mass" and "Extended Free-Body Diagrams"

12	HW #9 posted on D2L at 8AM on April 14	April 14	Electrical Properties / Electric Charge	Ch. 20: "Electrical Properties," "Two Kinds of Charge," and "Conservation of Charge"
		April 16	Electric Charge / the Electric Force Electricity and Gravity	Ch. 20: "Induced Attractions," "The Electric Force," and "Electricity and Gravity,"
13	HW #10 posted on D2L at 8AM on April 23	April 21	The Electric Field / Electric Potential	Ch. 20: "Electric Field Lines" and "Electric Potential"
	HW#9 DUE on April 23 at 10PM	April 23	Electric Current / Batteries Complete Circuits / Electric Resistance	Ch. 21: "Batteries," "A Water Model," "Pathways," and "Resistance"
14	HW#10 DUE on April 29 at 10PM	April 28	Electric Circuits / Electric Power	Ch. 21: "A Model for Electric Current," A Model for Voltage," and "Electric Power"
		April 30	EXAM IV	CHAPTERS 15 & 16
15		May 5	FINAL EXAM	8:00 AM—10:00 AM