West Chester University

Physics 100-04: Elements of Physical Science
Spring 2015

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 modern 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 and interactions. 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 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 electric 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 course in the WCU General Education program.

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, in addition to extending an existing body of knowledge to new situations in order to understand them. I will assume that you have some experience doing these things, but haven't practiced with them in a while.

Meeting Times: Monday, Wednesday, Friday from 1:00 PM to 1:50 PM
Merion Science Center, room 109

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 Turning Technologies ResponseCard RF LCD clicker

Instructor Information:

Dr. Michelle A. Caler
office: Merion Science Center room 135
office hours: Mondays, Wednesdays, Thursdays, and Fridays from 2:00PM—3:00PM
Tuesdays from 2:00PM—4:00PM
… and by appointment
email: 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 that you will gain a basic understanding of the methods of science and 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 and interactions 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 the 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 basic 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 "YouPredict Opportunities" (as detailed on page 5 of this syllabus), as well as assigned homework problems, will contribute to students' achievement of the above Course Goals.

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

Goal #2: Employ quantitative concepts and mathematical methods

This goal will be accomplished through in-class "Voting Opportunity" activities (as detailed on page 5 of this syllabus), example and practice problems discussed in lecture, and assigned homework problems.

Goal #3 Think critically and analytically

This goal will be accomplished through in-class activities such as "Voting Opportunities" and "YouPredict Opportunities" (as detailed on page 5 of this syllabus), as well as assigned homework problems.

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

Class Participation and Attendance: Class participation will be recorded using the Turning Technologies ResponseCard RF LCD clicker system. I am ***requiring*** that you buy a ResponseCard RF LCD and register it. Please purchase and register your ResponseCard by **Friday January 30th at noon**. Make sure that you bring it to every class, and that you occasionally check its battery life. I will have **ONE** spare ResponseCard that you can borrow in case you forget yours: first come, first served. You get **two** borrows per semester, and you must return my ResponseCard when class is over. If my spare ResponseCard walks away, there will be **NO** emergency borrowing opportunities for *anyone* for the rest of the semester.

Each day of class (test days not included) will be worth 3 points of class participation credit. Class participation points will be earned by responding with your ResponseCard to questions that I ask during my

PowerPoint presentations. These questions will consist of (but are not necessarily limited to) "Voting Opportunities" and "YouPredict Opportunities." I reserve the right to introduce ways in addition to these to earn class participation credit. To earn full class participation credit for a class period, you need to respond using your ResponseCard to ***ALL*** response questions asked in class, even times when I ask you to respond again after talking to a neighbour. Partial class participation credit will be awarded only under special circumstances, and at my discretion. You ***DO NOT*** have to answer response questions *correctly* in order to get full credit: you just have to attempt them. It is in your best interest to do your best to get the correct answer, though, so don't just randomly hit buttons when the questions come up. Give them your best go.

You ***MUST*** be present in class responding with your ResponseCard 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 5 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 ***IT IS YOUR RESPONSIBILITY*** to contact me by email to arrange a way to make up missed class participation points. Excused absences are limited to University-Sanctioned Events (which follow the Excused Absence Policy for University-Sanctioned Events as described in the West Chester University Undergraduate Catalog), and absences due to serious illness or injury, or the death of family members (each of which is to be verified in writing by a practicing, non-related physician). In cases of extreme illness or emergency that will require prolonged absence, *you are responsible* for contacting Dean Bricketto (Student Affairs). His office will contact your professors and make appropriate recommendations. If you are absent, whether excused or unexcused, ***IT IS YOUR RESPONSIBILITY*** 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.

In order to earn class participation points with your ResponseCard, ***YOU*** must be the one entering responses with it. I have a zero tolerance policy for ANYONE who hands their ResponseCard to a classmate and tells that classmate to use it in class for them. If I catch ***ANYONE*** using multiple ResponseCards in a class, this will be construed as cheating, and ***ALL*** involved parties will lose ***ALL*** class participation points for the semester. I reserve the right to introduce alternate forms of attendance taking to enforce this policy.

As with any technology, problems with the ResponseCard 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" section of this course's D2L webpage. There will be 10 homeworks—one for each chapter covered—assigned over the course of this semester. ***YOU ARE RESPONSIBLE FOR CHECKING D2L AND KEEPING UP WITH HOMEWORKS***; 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. 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 when they are being posted. Thus, you may wish to set up pre-timed reminders to check in on our course's D2L site. **I will not always remind you in class about homeworks**! 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, ***no exceptions***. 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 quite a bit 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 ***have a go at the homework at some point before the day it is due***. Report any problems with D2L ASAP by calling 1-877-325-7778 or visiting the ACC help desk in Anderson 20 (610-436-3350).

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 due dates and times due to unforeseen circumstances. You will be notified of any such changes both in class and on D2L.

Exams: There will be 4 in-class exams given over the course of the semester. The dates of these exams are:

February 16
March 20
April 10
May 1

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. 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 it is.

YOUR LOWEST EXAM GRADE WILL BE DROPPED. Thus only your 3 highest test grades will be counted. *THERE WILL BE NO MAKE-UP EXAMS GIVEN*. 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 University-Sanctioned Events as described in the West Chester University Undergraduate Catalog. 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—20 multiple choice questions and 1 open-ended problem, which I will design 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; however, even though earlier material is not explicitly tested it may still appear on an exam. You have been warned!

Tests will be *closed book* and *closed notebook*. 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 **strictly forbidden**. I will post on D2L the equations sheet that I will give you for an exam at least 24 hours before the exam time, so that you can see what will be on the sheet. You are permitted to use a stand-alone calculator (i.e., one that is ***not*** part of an iPod/iPad, cell phone, 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 will NOT bring extra calculators for you to use during exams. It is *YOUR RESPONSIBILITY* to make sure you have a working stand-alone calculator for exams.

After each exam, I will return to you the answer sheet which contains your solution to the open-ended question and your responses to the multiple choice questions. I will write your exam grade on the top of this sheet. I will hold the copies of the multiple choice exam questions in my office after you have seen them; you can make an appointment any time you like to come look at the multiple choice exam questions.

Final Exam: The final exam for this course will be given on Wednesday, May 6th from 1:00 PM—3:00 PM. This is the 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.

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 day-to-day 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 30th at 5PM**. I will NOT accept extra credit projects which were not announced to me by email by January 30th. Projects will be due on May 4th at the start of class. Successful completion of an extra credit project will boost your overall course grade by one percentage point.

Teaching Style: I will be using MS PowerPoint slides a great deal when going over course material in class; when example problems come up, I will use the chalk 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 on D2L **modified copies** of the MS PowerPoint slides I will use in class, in the so-called "structured note-taking" style. 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 slides 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 thinking about them. I will also leave plenty of room for you to write down key equations, words, and other ideas so that you'll remember them later. Please note carefully that these modified slides 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 limited to, tutorial activities, "Voting Opportunities," "YouPredict Opportunities," "Rank my *x*" questions, practice problems, and interactive lecture 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. Also, these cooperative in-class activities, 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.

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 Power Point 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.

Ye Olde Technology Policy: Please turn off all cell phones, iPods/iPads/iPhones, tablet PCs, Kindles, laptops, etc. before class. If you are expecting an emergency call, change your phone to vibrate mode and answer the call outside of our classroom. You are ***not allowed*** to use cell phones for texting or gaming during class. Doing so is distracting to your classmates and instructor. 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**. If you feel the temptation will be too great, be on the safe side and leave your device stored in your bag.

I do not allow the use of laptops or tablet PCs in my class. However, I am willing to make an exception for those who bought an e-copy of the textbook, provided that I see proof of the e-copy on your computer or tablet. I do understand that use of a laptop, or other personal electronic devices, may be required to accommodate certain disabilities. Terms of use in both of these cases can be discussed with me on an individual basis.

Email 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.

Academic 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 Undergraduate Course Catalogue, the Rams Eye View, or the University Web Site. Please understand that improper conduct in any of these areas will not be tolerated and may result in immediate ejection from the class.

Disability and Special Needs: If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University's Services for Students with Disabilities(OSSD), please 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, their fax number is 610-436-2600, their email address is ossd@wcupa.edu, and their website is at www.wcupa.edu/ussss/ossd.

Tutoring: Tutoring for PHY 100 is offered by the Learning Assistance Resource Center (LARC), 224 Lawrence Center, x2535. For more information, see http://www.wcupa.edu/ussss/larc/. LARC tutoring is free of charge, but you must sign up at the beginning of the semester. Physics majors MAY offer additional tutoring in PHY 100 during the semester. An announcement will be made in class if this is the case.

Withdrawal Notice: A syllabus constitutes a contract between student and instructor. Your continued enrollment after the **January 27th 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, or if you are unable to *reliably* access the internet to log on to D2L, 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 27th 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. You can contact me anytime to get an estimate of your grade as it stands at the moment.

Public Safety: 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 and to sign up, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.

Study tips:

- **Look at the learning objectives to see what I expect you to know and know how to do by the end of each unit and each chapter**. All in-class exams will be based on the chapter learning objectives; the final exam will be based on the unit learning objectives. Learning objectives for all units and chapters will be posted to the "course materials" section of D2L.
- Keep up with the readings and do them before class! Physics makes more sense if the exposure you get to an idea in class is your second time seeing it.
- Don't blow off the homework! It's a good way to accumulate points, and good practice for exams. Look in on D2L periodically to make sure you've made an attempt on an assigned homework!
- Check on D2L to see if I've posted any practice problems before tests or to go with the readings. They will be **ENTIRELY VOLUNTARY**, so you won't be graded on them or have your grade depend on doing them; however, they *can* help you gauge how well you understand the material. I will ***try*** to post practice problems to go with every reading, but I can't promise that I will always be able to do this.
- Play games with physics! More specifically, try playing "what-if" games with the concepts presented in class: If a flower pot bounced off one guy's head, but fell and shattered off another's, who feels the bigger force? What if a bug splats on a car window: does the bug or the car feel the bigger force? If you've played a little bit with concepts ahead of time, you're less likely to freeze up and panic if you see them on a test.
- Play "what-if" games with equations, too: What if I gave you two quantities and asked for a third? What's your plan for that? How about if one of two quantities in an equation gets bigger—what happens to the other one? If you have an action plan for these things in your head, you're less likely to freeze up and panic if I ask you to do them on a test.
- Please make use of my office hours, and don't hesitate to email me questions about the homework or to schedule a time to meet outside of office hours.

CLASS SCHEDULE

This is the tentative schedule; I will try to follow it as closely as possible. 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	Class Meeting	Topic	Readings Due
1	Practice HW posted ON D2L at 8AM on January 21	January 21	Welcome, Course Intro	--
		January 23	Building a World View / What is Physics	Ch. 1: "First Grade," "On Building a World View," AND Ch. 11: "Building Models"
2	Practice HW DUE on January 27 at 10PM	January 26	What "Counts" as Physics / Measurement	Ch. 1: "Bode's Law," "Measurements;" and "Sizes: Large and Small"
	HW#1 posted ON D2L at 8AM on January 28	January 28	Measurement / Scales / Speed	Ch. 1: "Sizes: Large and Small;" Ch. 2: "Average Speed," and "Images of Speed"
		January 30	Speed / Velocity	Ch. 2: "Images of Speed," "Instantaneous Speed," and "Speed with Direction"
3	HW#1 DUE on February 3 at 10PM	February 2	Acceleration / the Kinematic Equations of Motion	Ch. 2: "Acceleration" and "A First Look at Falling Objects"
	HW#2 posted ON D2L at 8AM on February 4	February 4	the Kinematic Equations of Motion / Free-fall	Ch. 2: "Free Fall: Making a Rule of Nature," "Starting with an Initial Velocity," and "A Subtle Point"
		February 6	Adding Vectors / Force / Tour de Force	Ch. 3: "Adding Vectors," "An Early Explanation," "The Beginnings of Our Modern Explanation," "Weight," and "Friction"
4	HW#2 DUE on February 10 at 10PM	February 9	Newton's Laws / Mass vs. Weight	Ch. 3: "Newton's First Law," "Newton's Second Law," and "Mass and Weight"
	HW#3 posted ON D2L at 8AM on February 10	February 11	Newton's Laws / Free-Body Diagrams	Ch. 3: "Mass and Weight," "Newton's Third Law," and "Free-Body Diagrams"
		February 13	Review for Exam I	Readings from Jan. 23 thru Feb. 11
5	HW#3 DUE on February 15 at 10PM	***February 16***	***EXAM I***	***CHAPTERS 1—3***
		February 18	Uniform Circular Motion	Ch. 4: "Circular Motion," "Acceleration Revisited," and "Acceleration in Circular Motion"

5		February 20	Uniform Circular Motion / Projectile Motion	Ch. 4: “Acceleration in Circular Motion” and “Projectile Motion”
6	HW#4 posted ON D2L at 8AM on February 25	February 23	Projectile Motion	Ch. 4: “Projectile Motion” and “Launching an Apple into Orbit”
		February 25	Projectile Motion / Newton’s Gravity	Ch. 4: “Launching an Apple into Orbit” and Ch. 5: “The Concept of Gravity”
		February 27	Newton’s Gravity	Ch. 5: “The Concept of Gravity,” “Newton’s Gravity,” and “The Law of Universal Gravitation”
7	HW#4 DUE on March 3 at 10PM	March 2	Newton’s Gravity / Gravitational Fields	Ch. 5: “The Law of Universal Gravitation,” “The Value of G,” and “The Field Concept”
	HW#5 posted ON D2L at 8AM on March 2	March 4	Tides / Momentum / Impulse	Ch. 5: “Tides;” Ch. 6: “Linear Momentum” and “Changing an Object’s Momentum”
	HW#6 posted ON D2L at 8AM on March 6	March 6	Momentum / Impulse	Ch. 6: “Changing an Object’s Momentum” and “Conservation of Linear Momentum”
		March 9	Spring Break! ☺	None! Have some fun!
		March 11	Spring Break! ☺	None! Have some fun!
		March 13	Spring Break! ☺	None! Have some fun!
8	HW#5 DUE on March 16 at 10PM	March 16	Systems / the Law of Conservation of Linear Momentum / Collisions	Ch. 6: “Conservation of Linear Momentum” and “Collisions”
	HW#6 DUE on March 19 at 10PM	March 18	Review for Exam II	Readings from Feb. 18 thru Mar. 16
		March 20	***EXAM II***	***CHAPTERS 4—6***
9		March 23	What is Energy / Kinetic Energy	Ch. 7: “What is Energy?” and “Energy of Motion”
		March 25	Work / Gravitational Potential Energy	Ch. 7: “Changing Kinetic Energy,” “Forces That Do No Work” and “Gravitational Potential Energy”
		March 27	Gravitational Potential Energy / The Law of Conservation of Mechanical Energy	Ch. 7: “Gravitational Potential Energy” and “Conservation of Mechanical Energy”

10	HW#7 posted ON D2L at 8AM on April 1	March 30	The Law of Conservation of Mechanical Energy / Power	Ch. 7: “Conservation of Mechanical Energy” and “Power”
	HW#8 posted ON D2L at 8AM on April 3	April 1	Power / Rotational Motion	Ch. 7: “Power” AND Ch. 8: “Rotational Motion”
		April 3	Torque / Extended Free-Body Diagrams	Ch. 8: “Torque,” “Center of Mass,” and “Extended Free-Body Diagrams”
11	HW#7 DUE on April 7 at 10PM	April 6	Extended Free-Body Diagrams / Static Equilibrium	Ch. 8: “Extended Free-Body Diagrams”
	HW#8 DUE on April 9 at 10PM	April 8	Review for Exam	Readings from Mar. 23 thru Apr. 6
		April 10	***EXAM III***	***CHAPTERS 7 & 8***
12		April 13	Electrical Properties / Electric Charge	Ch. 20: “Electrical Properties,” “Two Kinds of Charge,” and “Conservation of Charge”
		April 15	Electric Charge / the Electric Force	Ch. 20: “Induced Attractions,” “The Electroscope,” and “The Electric Force”
		April 17	Electricity and Gravity / The Electric Field	Ch. 20: “Electricity and Gravity,” “The Electric Field” and “Electric Field Lines”
13	HW#9 posted ON D2L at 8AM on April 20	April 20	The Electric Field / Electric Potential	Ch. 20: “Electric Field Lines” and “Electric Potential”
	HW#10 posted ON D2L at 8AM on April 24	April 22	Electric Current / Batteries	Ch. 21: “Batteries,” “A Water Model,” and “Pathways”
		April 24	Complete Circuits / Electric Resistance	Ch. 21: “Pathways” and “Resistance”
14	HW#9 DUE on April 26 at 10PM	April 27	Electric Circuits	Ch. 21: “A Model for Electric Current” and “A Model for Voltage”
	HW#10 DUE on April 30 at 10PM	April 29	Electric Circuits / Electric Power	Ch. 21: “A Model for Electric Current,” “A Model for Voltage,” and “Electric Power”
		May 1	***EXAM IV***	***CHAPTERS 20—21***
		May 4	Review for Final Exam	Readings from Jan. 23 through Apr. 29
		May 6	***FINAL EXAM***	***1:00AM—3:00 PM***