

## PY 205 Syllabus – Spring 2016

### **Course description**

Physics for Engineers and Scientists I – PY 205 is the first course in a two-semester sequence of introductory calculus-based physics courses. The focus is on mechanics and thermodynamics.

### **Course objectives**

By the end of this course, you will

- have acquired an overview of the general principles of physics and how they apply to mechanics and physical interactions, and
- be able to solve elementary physics problems systematically, logically, and quantitatively through the use of techniques based on algebra, trigonometry, calculus, and graphical methods.

### **Student learning objectives**

The Learning Objectives for each exam will be posted on each section's web site prior to the first lecture of the sequence leading up to that exam and will serve as both a study outline and a summary of items to review. The Learning Objectives list the topics that a student must *know* and *apply* to demonstrate mastery of the material presented in this course.

### **Course prerequisites**

The prerequisite for PY 205 is MA 141 with a grade of C– or better. A high degree of fluency in algebra, geometry, trigonometry, and calculus (differential and integral) is essential. Students not meeting the prerequisite must either drop the course or present a written request for exemption signed by their advisor or the appropriate person in the Academic Affairs Office or Dean's Office of their College. Students who do not meet the prerequisite and do not obtain an approved exemption may be dropped from the roll.

### **Course co-requisites**

The co-requisite for PY 205 is PY 206, a one credit hour laboratory course. You must enroll in PY 206 to keep your enrollment status for PY 205, unless you have passed PY 206 in a previous semester.

### **Expectation of students**

- Read the textbook before come to class.
- Attend class and participate actively.
- Keep organized class notes.
- Complete homework assignments on time and take the opportunity to learn from those assignments.
- Continuously evaluate your own mastery of the material, and seek help immediately whenever necessary.
- Be courteous to the other students in the class, which means not playing on your laptop or electronic devices, not talking out of turn, arriving and leaving class on time.

### **Instructor Information**

Section: \_\_\_\_\_

Name: \_\_\_\_\_

Email: \_\_\_\_\_

Office: \_\_\_\_\_

Office Hours: \_\_\_\_\_

### Required materials: options and approximate costs

<b>WebAssign:</b> Course PY205 (Giancoli)	\$29.95
<b>Clicker</b> – Response Card NXT If you already own a TurningPoint Response Card from a previous class, you do not need to purchase a new one.	\$50.00 (new) \$34.00 (used)
<b>Textbook:</b> Giancoli, <i>Physics for Scientists and Engineers with Modern Physics</i> , Fourth Edition, Pearson/Prentice-Hall, © 2009 Option 1: Full volume in hardcover (covers PY205 & PY208) Option 2: Vol. 1 (covers PY205 only) These are NCSU Bookstore hardcover prices. More options: Fixed time electronic rental versions are also available through the Bookstore following links at <a href="http://shop.bookstore.ncsu.edu/">http://shop.bookstore.ncsu.edu/</a> . A variety of other options are available online through other vendors.	\$266 or \$175 (used) \$127 (used)
<b>Scientific/graphing calculator</b>	....

### Grade and course components

The final grade in the course will be determined on the following basis:

Lecture participation (attendance and quiz)	5%
Homework	8%
Reading Quizzes	2%
Problem Sessions	10%
Exam (3 @15% each)	45%
Final Exam	30%
Total	100%

Below is a breakdown of each course component with expectations and policies.

<b>Lecture</b>	<ul style="list-style-type: none"> <li>You are required to read the textbook sections prior to every class; it makes for efficient learning.</li> <li>Weekly reading quiz will be submitted via the WebAssign online system. As a general rule, assignments will be due 1 hour before the first class of the week.</li> <li>Attendance is required, and is worth a small percentage of your final grade. Many students do not realize how important it is to come to class, and giving credit for work in class is one way of emphasizing its importance.</li> <li>Clickers will be used to track attendance and promote active learning by providing instant feedback for both the instructor and students. Clickers might also be used to do in-class quizzes. If your clicker does not work or if you forget your clicker you will not receive attendance credit. (Note: if your clicker stops functioning, contact the bookstore for the warranty and replacement policy.)</li> <li>During the course of a semester, it's understandable that you might miss a few lectures. Attendance credit will be excused for days missed due to illness or for participation in university sponsored events (documentation required). Excuses for unanticipated absences must be reported to the instructor no more than one week after the return to class.</li> <li>Your participation grade will have 10% added on to your actual participation percentage, but your participation grade will be capped at 100%.</li> <li>If you miss class, it is your responsibility to find out what you missed.</li> </ul>
<b>Homework</b>	<ul style="list-style-type: none"> <li>A major part of what you are expected to learn will come as a result of doing homework. You need to fully <i>understand</i> how to solve the assigned homework problems to do well on the exams and to succeed in this course.</li> </ul>

	<ul style="list-style-type: none"> <li>Individual homework will be submitted via the WebAssign online system. As a general rule, assignments will be due on Mondays and Thursdays at midnight, though the due dates may be adjusted on occasion. Homework will be due during the last week of classes.</li> <li>You are normally allowed three free submissions per question part, excepting multiple choice questions with fewer than three choices. Additional submissions will incur a 25% penalty per submission. (Example 4 submissions – 25%, 5 submissions – 50%) It is therefore important that you work each problem carefully on paper before submitting your answers. This practice is vital to learning the material and will also help you when reviewing the assignments before a test.</li> <li>You can request an automatic extension any time up to 2 days after the assignment is due. Each extension (up to 2 per assignment) will grant you 24 hours to work the unanswered problems at a 25% penalty of all unearned points. Extensions will be granted on homework deadlines with excused absences.</li> <li>There are websites where you can view (or perhaps purchase) solutions to homework problems. I cannot stop you from cheating, but I strongly recommend you don't. <i>Consider your goals...are you trying to just get the homework done or do you actually want to learn something?</i> I guarantee that the more you use solutions written by someone else, the less likely you will be able to produce your own solutions on quizzes and exams.</li> </ul>
<b>Problem Sessions</b>	<ul style="list-style-type: none"> <li>The problem session score accounts for 10% of your final score. This will be divided equally between your attendance and graded group problems.</li> <li>The problem session score is based on group work. It's designed to provide you with a collaborative learning environment so you can help and learn from each other. To ensure the integrity of group work and fairness to each group member, full attendance is required.</li> <li>If you attend at least 90% of the problem sessions for this semester, your score will be 100% for the attendance portion of the problem sessions part of the course. The score will decrease linearly for every problem session missed. There are no makeup problem sessions. Problem sessions can only be excused by documented medical emergencies or documented NCSU sponsored events.</li> <li>Your problem session instructor will provide specific guidelines.</li> <li>Contact the problem session coordinator, Dr. Colleen Countryman, <a href="mailto:colleen_countryman@ncsu.edu">colleen_countryman@ncsu.edu</a>, for any problems with the problem sessions.</li> </ul>
<b>Exams</b>	<ul style="list-style-type: none"> <li>Three 90 minute exams will be given on Tuesday nights. See the schedule for dates.</li> <li>Each exam will consist of a mix of multiple-choice questions and show-your-work problems.</li> <li>Equation sheets, learning objectives, and a few tests from previous semesters will be provided well before the exam.</li> <li>Required material for each exam are: <ul style="list-style-type: none"> <li>--a calculator: no cell phones, laptops, and tablets</li> <li>--NCSU Photo ID</li> <li>--A number 2 Pencil</li> </ul> </li> <li>There are no scheduled makeup tests. Students with excused absences, in accordance with the NCSU attendance policy, will be given options to correct the missed grade at the discretion of the instructor. <a href="http://policies.ncsu.edu/regulation/reg-02-20-03">http://policies.ncsu.edu/regulation/reg-02-20-03</a></li> </ul>
<b>Final Exam</b>	<p>The final exam is comprehensive, and will cover everything in the course. The final exam is important, because it offers an opportunity to show what you have learned in the course, and is thus worth 30% of your course grade.</p>

## Numerical ranges for final grades

Grade	Percent	Grade	Percent	Grade	Percent	Grade	Percent
A+	97–100	B+	87–89.9	C+	77–79.9	D+	67–69.9
A	93–96.9	B	83–86.9	C	73–76.9	D	63–66.9
A–	90–92.9	B–	80–82.9	C–	70–72.9	D–	60–62.9
						F	<60

Exam and course grades are determined on an absolute basis rather than “grading on a curve.” Why should one assume that x% of students will be failing? If everyone were to learn the material extremely well, everyone should get an A. How well your neighbor is doing should not affect your grade. *Help your peers and learn from each other.*

There is NO extra credit at the end of the term. It is far easier to fix problems early in the semester than after the tests have been taken.

### Tutorial center

Physics Tutorial Center: Information on hours of operation and the location of the Physics Department’s free, walk-in tutorial center can be found at the Physics Tutorial Services web site:  
<http://www.physics.ncsu.edu/classes/tutor.php>.

University Tutorial Center: NCSU also offers free tutoring and supplemental instruction at the University Tutorial Center. See <http://tutorial.ncsu.edu/>.

### Statement on academic integrity

I am committed to upholding the University policy on academic integrity, as described in the Code of Student Conduct – POL 11.35.01. This Code can be found at <http://policies.ncsu.edu/policy/pol-11-35-01>. I expect students enrolled in this course also to abide by University policy concerning academic integrity. In placing your name on any paper (homework, test, final exam) to be graded, you affirm that you have neither given nor received unauthorized aid on the work submitted. Should this not be the case, the work will not be accepted and a grade of zero will be recorded. If you are caught cheating on a test or exam, the minimum penalty will be a grade of F on the exam and the maximum will be a grade of F in the course and other actions taken by student conduct.

### Statement for students with disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 919-515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (REG02.20.01) <http://policies.ncsu.edu/regulation/reg-02-20-01>.

### Statement on electronic course components

Students may be required to disclose personally identifiable information to other students in the course, via electronic tools like email or web-postings, where relevant to the course. Examples include online discussions of class topics and posting of student coursework. All students are expected to respect the privacy of each other by not sharing or using such information outside the course.

### Statement on extra expenses

Beyond the purchase of the textbook, WebAssign access, response card, and a suitable calculator, there are no significant extra expenses.

### **Statement on transportation**

Not applicable

### **Class evaluations**

Class evaluations will be available for students to complete online. An Email reminder will be sent by NCSU as the time approaches. All evaluations are confidential: instructors will not know how any one student responded to any given question, and students will not be able to access the ratings for any instructor. More information can be found at <http://oirp.ncsu.edu/eval/clev/students-info>.

### **General Education Program**

PY 205, when taken with PY 206, counts towards completion of the Natural Sciences category of the GEP Requirements. As can be seen from the Learning Objectives, this course will thoroughly help students to: 1) use the methods and processes of science in testing hypotheses, solving problems and making decisions; and 2) make inferences from and articulate, scientific concepts, principles, laws, and theories, and apply this knowledge to problem solving.

### **Policies, Regulations, and Rules**

Students are responsible for reviewing the NC State University PRR's, located at <http://oucc.ncsu.edu/course-rights-and-responsibilities> which pertains to their course rights and responsibilities.

### **Non-Discrimination Policy**

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at <http://policies.ncsu.edu/policy/pol-04-25-05> or <http://oied.ncsu.edu/oied/>. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Institutional Equity & Diversity at 919-515-3148.

### **Supporting Fellow Students in Distress**

As members of the NC State Wolfpack community, we each share a personal responsibility to express concern for one another and to ensure that this classroom and the campus as a whole remains a safe environment for learning. Occasionally, you may come across a fellow classmate whose personal behavior concerns or worries you. When this is the case, I would encourage you to report this behavior to the NC State Students of Concern website: <http://studentsofconcern.ncsu.edu/>. Although you can report anonymously, it is preferred that you share your contact information so they can follow-up with you personally.

### **Other information relevant to the course**

Your instructor may post contact information, lecture notes, FAQs, or other study aids on the Section web site as the course progresses. You will be notified of these either in the lectures or by email.

**PY 205 Schedule – Spring 2016, MWF**

<b>Wk</b>	<b>Date</b>	<b>Topics</b>	<b>Readings<sup>1</sup></b>	<b>Homework<sup>2</sup></b>
1	Jan 6 (W)	Class Overview/Syllabus Nature of Science, Measurement, Uncertainty, Significant Figures, Units, Order of Magnitude, Dimensions and Dimensional Analysis	Ch1: 1-7	<u>HW#0</u> • Intro to WebAssign • Math Review • Syllabus
	Jan 8 (F)	Displacement, Velocity	Ch2: 1-3	
2	Jan 11 (M)	Acceleration, 1-D Kinematics	Ch2: 4-6	<u>HW#1</u> <b>Ch1:</b> 3, 5, 8, 21, 57
	Jan 13 (W)	Free Fall, Vectors	Ch2: 7 Ch3: 1-5	
	Jan 15 (F)	2-D Kinematics, Relative Motion	Ch3: 7-9	
3	Jan 18 (M)	Martin Luther King, Jr. Day – No Class		<u>HW#2</u> <b>Ch2:</b> 2, 7, 16, 21, 40, 51, 58, 67,70
	Jan 20 (W)	Force, Newton's 1 <sup>st</sup> and 2 <sup>nd</sup> Laws	Ch4: 1-4	
	Jan 22 (F)	Newton's 3 <sup>rd</sup> laws	Ch4: 5-8	
4	Jan 25 (M)	Using Newton's laws	Ch5: 1	<u>HW#3</u> <b>Ch3:</b> 2, 7, 8, 29, 32, 46, 81, 67, 75 <u>HW#4</u> <b>Ch4:</b> 2, 6, 10, 12, 24, 33, 35, 46, 48
	Jan 27 (W)	Uniform Circular Motion	Ch5: 2-4	
	Jan 29 (F)	Nonuniform Circular Motion	Ch5: 5	
5	Feb 1 (M)	Review Ch. 1-5		<u>HW#5</u> <b>Ch5:</b> 2, 11, 17, 18, 34, 35, 40, 62
	<b>Feb 2 (T)</b>	<b>Exam 1, 7:10-8:40 pm, Ch. 1-5, Location TBD</b>		
	Feb 3 (W)	Newton's Law of Universal Gravitation	Ch6: 1-2	
	Feb 5 (F)	Gravity near the Earth's surface, Gravitational Field	Ch6: 3-6	
6	Feb 8 (M)	Work, Scalar Product	Ch7: 1-3	<u>HW#6</u> <b>Ch6:</b> 1, 2, 7, 9, 29, 31, 52 <u>HW#7</u> <b>Ch7:</b> 2, 3, 11, 15, 23, 55, 63, 73
	Feb 10 (W)	Work-Energy Principle	Ch7: 4	
	Feb 12 (F)	Potential Energy, Conservation of Mechanical Energy	Ch8: 1-5	
7	Feb 15 (M)	Dissipative Forces, Power	Ch8: 6-8	<u>HW#8</u> <b>Ch8:</b> 1, 8, 11, 16, 18, 20 <u>HW#9</u> <b>Ch8:</b> 46, 56, 64, 69
	Feb 17 (W)	Momentum and Impulse	Ch9: 1-3	
	Feb 19 (F)	Elastic and Inelastic Collisions	Ch9: 4-6	
8	Feb 22 (M)	Center of Mass, Angular Quantities	Ch9: 8-9 Ch 10: 1-3	<u>HW#10</u> <b>Ch9:</b> 4, 5, 10, 12, 13,

<sup>1</sup> Readings are to be done before coming to class.

<sup>2</sup> Homework is due at times noted on WebAssign assignments. Numbers listed are textbook end-of-chapter problems. Additional questions might be assigned on WebAssign in addition to the end-of-chapter problems.

	Feb 24 (W)	Torques, Rotational Dynamics, Moments of Inertia	Ch 10: 4-7	22, 23 HW#11
	Feb 26 (F)	Rotational KE	Ch 10: 8-9	Ch9: 35, 36, 46, 98, 62, 72, 75, 77
9	Feb 29 (M)	Review Ch. 1-10		HW#12 Ch10: 1, 5, 8, 23, 25, 26, 28, 40, 48, 63
	Mar 1 (T)	<b>Exam 2, 7:10-8:40 pm, Ch. 1-10</b>		
	Mar 2 (W)	Angular Momentum, Vector Product	Ch11: 1-3	HW#13 Ch11: 2, 4, 10, 11, 24, 29
	Mar 4 (F)	Conservation of Angular Momentum	Ch11: 4-6	
10	Mar 7-11	Spring Break – No Class		
11	Mar 14 (M)	Static Equilibrium	Ch12: 1-3	HW#14
	Mar 16 (W)	Fluid, Pressure, Pascal's Principle	Ch13: 1-6	Ch11: 34, 36, 37, 39, 48, 50, 65, 73
	Mar 18 (F)	Archimedes' Principle	Ch13: 7	
12	Mar 21 (M)	Equation of Continuity, Bernoulli's Equation	Ch13: 8-10	HW#15 Ch12: 8, 9, 11, 12, 18 21, 22
	Mar 23 (W)	Simple Harmonic Motion	Ch14: 1-4	HW#16 Ch13: 9, 11, 16, 18, 20
	Mar 25 (F)	Spring Holiday – No Class		
13	Mar 28 (M)	Pendulum	Ch14: 5, 6	HW#17 Ch13: 29, 42, 43, 44, 52, 54, 88
	Mar 30 (W)	Wave Properties	Ch15: 1-4	HW#18
	Apr 1 (F)	Superposition, Interference	Ch15: 6-8	Ch14: 6, 12, 16, 17, 27, 36, 42, 73
14	Apr 4 (M)	Standing Wave	Ch15: 9	HW#19
	Apr 6 (W)	Sound Wave	Ch16: 1, 3, 4, 6	Ch15: 1, 4, 9, 24, 30, 37, 48, 49, 50, 54
	Apr 8 (F)	Doppler Effect	Ch16: 7	
15	Apr 11 (M)	Review Ch. 1-16		HW#20 Ch16: 1, 15, 21, 25, 61, 62, 70, 95
	Apr 12 (T)	<b>Exam 3, 7:10-8:40 pm, Ch. 1-16</b>		
	Apr 13 (W)	Temperature, Ideal Gas Law	Ch17: 1-3, 6-9	HW#21 Ch17: 28, 31, 37, 43, 50, 51
	Apr 15 (F)	Kinetic Theory of Gases	Ch18: 1	Ch18: 1
16	Apr 18 (M)	Heat, First Law of Thermo	Ch19: 1-9	HW#22 Ch19: 1, 7, 8, 31, 33, 34, 38, 51, 53
	Apr 20 (W)	2 <sup>nd</sup> Law of Thermo, Heat Engines	Ch20: 1-2	HW#23
	Apr 22 (F)	Reversible and Irreversible Processes, Refrigerators	Ch20: 3-4	Ch20: 1, 4, 8, 19

17	Apr 25 (M)	Final Exam Review
	<b>Apr 27 (W)</b>	<b>Final Exam, 6:00-9:00 pm, Ch. 1-20</b>

**Important dates:**

*January 12, Tuesday—Last day to add a course*

*January 20, Wednesday—Last day to withdraw a course without a W grade*

*March 2, Wednesday—Last day to drop a course*





**PY 205 Schedule – Fall 2016, TH**

<b>Wk</b>	<b>Date</b>	<b>Topics</b>	<b>Readings<sup>3</sup></b>	<b>Homework<sup>4</sup></b>
1	Jan 7 (H)	Class Overview/Syllabus Nature of Science, Measurement, Uncertainty, Significant Figures, Units, Order of Magnitude, Dimensions and Dimensional Analysis	Ch1: 1-7	<u>HW# 0</u> • Intro to WebAssign • Math Review • Syllabus
2	Jan 12 (T)	Displacement, Velocity, Acceleration	Ch2: 1-4	<u>HW#1</u> <b>Ch1:</b> 3, 5, 8, 21, 57
	Jan 14 (H)	1-D Kinematics, Free Fall	Ch2: 5-7	
3	Jan 19 (T)	Vectors, 2-D Kinematics, Relative Motion	Ch3: 1-9	<u>HW#2</u> <b>Ch2:</b> 2, 7, 16, 21, 40, 51, 58, 67,70 <u>HW#3</u> <b>Ch3:</b> 2, 7, 8, 29, 32, 46, 81, 67, 75
	Jan 21 (H)	Force, Newton's 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> laws	Ch4: 1-8	
4	Jan 26 (T)	Using Newton's laws	Ch5: 1	<u>HW#4</u> <b>Ch4:</b> 2, 6, 10, 12, 24, 33, 35, 46, 48
	Jan 28 (H)	Uniform and Nonuniform Circular Motion	Ch5: 2-5	
5	Feb 2 (T)	Review Ch. 1-5		<u>HW#5</u> <b>Ch5:</b> 2, 11, 17, 18, 34, 35, 40, 62
	<b>Feb 2 (T)</b>	<b>Exam 1, 7:10-8:40 pm, Ch. 1-5</b>		
	Feb 4 (H)	Newton's Law of Universal Gravitation	Ch6: 1-6	
6	Feb 9 (T)	Work, Scalar Product, Work-Energy Principle	Ch7: 1-4	<u>HW#6</u> <b>Ch6:</b> 1, 2, 7, 9, 29, 31, 52 <u>HW#7</u> <b>Ch7:</b> 2, 3, 11, 15, 23, 55, 63, 73
	Feb 11 (H)	Potential Energy, Conservation of Mechanical Energy	Ch8: 1-5	
7	Feb 16 (T)	Dissipative Forces, Power, Momentum and Impulse	Ch8: 6-8 Ch9: 1-3	<u>HW#8</u> <b>Ch8:</b> 1, 8,11,16,18,20 <u>HW#9</u> <b>Ch8:</b> 1, 4, 8, 18, 20, 49, 96, 36, 69
	Feb 18 (H)	Elastic and Inelastic Collisions	Ch9: 4-6	
8	Feb 23 (T)	Center of Mass, Angular Quantities	Ch9: 8-9 Ch 10: 1-3	<u>HW#10</u> <b>Ch9:</b> 4, 5, 10, 12, 13, 22, 23 <u>HW#11</u> <b>Ch9:</b> 35, 36, 46, 98, 62, 72, 75, 77
	Feb 25 (H)	Torques, Rotational Dynamics, Moments of Inertia, Rotational KE	Ch10: 4-9	

<sup>3</sup> Readings are to be done before coming to class.

<sup>4</sup> Homework is due at times noted on WebAssign assignments. Numbers listed are textbook end-of-chapter problems. Additional questions might be assigned on WebAssign in addition to the end-of-chapter problems.

9	Mar 1 (T)	Review Ch. 1-10		<u>HW#12</u> <b>Ch10:</b> 1, 5, 8, 23, 25, 26, 28, 40, 48, 63
	<b>Mar 1 (T)</b>	<b>Exam 2, 7:10-8:40 pm, Ch. 1-10</b>		
	Mar 3 (H)	Angular Momentum, Cross Product, Conservation of Angular Momentum	Ch11: 1-6	<u>HW#13</u> <b>Ch11:</b> 2, 4, 10, 11, 24, 29
10	Mar 7 – 11	Spring Break – No class		
11	Mar 15 (T)	Static Equilibrium	Ch12: 1-3	<u>HW#14</u> <b>Ch11:</b> 34, 36, 37, 39, 48, 50, 65, 73
	Mar 17 (H)	Fluid, Pressure, Pascal's Principle, Archimedes' Principle	Ch13: 1-7	
12	Mar 22 (T)	Equation of Continuity, Bernoulli's Equation	Ch13: 8-10	<u>HW#16</u> <b>Ch14:</b> 6, 12, 16, 17, 27, 36, 42, 73
	Mar 24 (H)	Simple Harmonic Motion	Ch14: 1-4	
13	Mar 29 (T)	Pendulum	Ch14: 5-6	<u>HW#17</u> <b>Ch15:</b> 1, 4, 9, 24, 30, 37, 48, 49, 50, 54
	Mar 31 (H)	Wave Properties	Ch15: 1-4	
14	Apr 5 (T)	Superposition, Interference, Standing Wave	Ch15: 6-9	<u>HW#18</u> <b>Ch13:</b> 9, 11, 16, 18, 20 <u>HW#19</u> <b>Ch13:</b> 29, 42, 43, 44, 52, 54, 88
	Apr 7 (H)	Sound Wave, Doppler Effect	Ch16: 1, 3, 4, 6, 7	
15	Apr 12 (T)	Review Ch. 1 – 16		<u>HW#20</u> <b>Ch16:</b> 1, 15, 21, 25, 61, 62, 70, 95
	<b>Apr 12 (T)</b>	<b>Exam 3, 7:10-8:40 pm, Ch. 1-16</b>		
	Apr 14 (H)	Temperature, Ideal Gas Law, Kinetic Theory of Gases	Ch17: 1-3, 6-9 Ch18: 1	<u>HW#21</u> <b>Ch17:</b> 28, 31, 37, 43, 50, 51 <b>Ch18:</b> 1
16	Apr 19 (T)	Heat, 1 <sup>st</sup> Law of Thermodynamics	Ch19: 1-9	<u>HW#22</u> <b>Ch19:</b> 1, 7, 8, 31, 33, 34, 38, 51, 53 <u>HW#23</u> <b>Ch20:</b> 1, 4, 8, 19
	Apr 21 (H)	2 <sup>nd</sup> Law of Thermodynamics, Heat Engines, Reversible and Irreversible Processes, Refrigerators	Ch 20: 1-4	
17	<b>Apr 27 (W)</b>	<b>Final Exam, 6:00 – 9:00 pm, Ch. 1-20</b>		

**Important Dates:**

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