Syllabus: PHY132 Spring 2018

PHY132 is the second of a two semester survey of classical physics and covers electromagnetism. The topics are covered "Giancoli" (see below) Chapters 21 to 35. This course is calculus based and the co-requisite is MAT 132.

The pace of the course is extremely rapid; a great deal of material will be covered. Careful reading of the text is mandatory. Dropping the course, or changes of section within size limits can be done through the electronic registrar system.

There will be assigned homework problems, quizzes in the recitation, two mid-term exams and a final exam.

Finally, this is a large, fast paced, and difficult course. That has the unfortunate consequence that, to make the class fair for all students, the policies are not very flexible.

Contact Information

Instructor: Prof. Clark McGrew
Office: D-134
Phone: 631-632-8299
EMail: clark.mcgrew@stonybrook.edu

Web Page Addresses


Check out this page from time to time for course announcements, grades etc. The material will also be linked from blackboard.

Textbooks

The text is Physics for Scientists and Engineers by Giancoli (Pearson Prentice Hall, 2008). It is available through the bookstore at the publishers list price. You must have access to the www.masteringphysics.com web site which will be used for all homework assignments.

Lecture

Lectures are at 8am, MWF. Attendance is strongly suggested. Concepts and problems treated in lecture will dominate the examinations. You are strongly encouraged to have read the lecture topics in the book before coming to lecture. During lecture, I will concentrate on the important aspects of each topic and cover any points that might not have been apparent in the reading. You are responsible for any material and announcements made during lecture, so make sure you speak to a classmate after any lecture that you miss.

Homework

You are strongly urged to read the book sections listed in the course calendar before coming to the lecture; the lecture will be much more meaningful if you do this. You should expect to spend several hours reading the material and practicing problem solving each week. In addition, the assigned homework problems are expected to take about two
hours to complete. Each week's homework problems are due at the beginning of the following week. Late homework is penalized, so complete the homework before the due date.

**Recitation**

There will be a one-hour recitation section during most weeks. Attendance is mandatory, and students not attending the entire recitation will be penalized. The purpose of these sessions is to provide a small-class atmosphere where assigned problems and physics concepts can be discussed and where your particular questions can be answered. The assigned problems and reading due the prior week will be used as the basis for discussion and quizzes in recitation the following week. Your level of preparation and knowledge concerning the assigned problems will be tested during the recitation period. There will be a quiz drawn from the previous weeks homework given during most recitations that will be graded on a scale of 0 to 15. You will receive a minimum score of 5 points for taking the quiz, plus 5 or 6 points for demonstrating that you understand the question, 7 or 8 points for making a plausible attempt at a solution, and 9 or 10 points for a substantially correct answer. In general, make-ups for missed quizzes will not be offered. Students requiring accommodation for testing should work with DSS, your recitation instructor and Prof. McGrew to determine an appropriate solution.

**Help**

You may contact your recitation instructor or any other recitation instructor during office hours. The teaching assistants in the physics help room (A-131) will also be available to help you.

**Computer Access**

You will need computer access. The University has several SINC sites, where a large number of computers are located. Depending on the local policies of the SINC site you are using, you may need an account to log in to the campus network. Be aware of the fact that some of the sites are busier than others. Contact the personnel at a SINC site close to you and ask about the details.

**Examinations**

The exams will cover the book sections indicated in the course schedule, plus any additional material discussed in lecture. Each exam will be cumulative in the sense that you will be responsible for information covered in previous exams. However, the second midterm will focus primarily on information covered after the first midterm, and the final exam will have some emphasis on material covered after the second midterm, although the whole course will be covered.

The exams will emphasis basic principles over memorization, but will be closed book. You may bring one 8.5 inch by 11 inch sheet of notes with writing on both sides.

You should bring a pen/pencil and a hand-held calculator capable of doing simple arithmetic and trigonometric functions to the exam. Replacement calculators will not be provided, and you may not share a calculator during an exam. If your calculator does not work or you forgot to bring one you will have to complete the exam without using a calculator. Your identification may be checked during each exam. You must bring a photo id to the exams. Examples of acceptable identification include: Stony Brook student identification, a driver's license, a green card/passport, etc.

Notebooks computers, smart phones, tablets or other hand-held devices with significant memory, and devices with communication options (including beepers, buzzers, phones, tablets, tin cans with string attached, etc.) are not allowed. Simply put, calculators are allowed, and other devices are not allowed. If you have a question about a particular calculator, ask. Typically, any calculator allowed on the SAT will be allowed.

I expect no communication between students on the exams. Any evidence of cheating will be reported to the academic hearing officer. Cheating will result in a stiff grade penalty. Leaving the exam room is by permission only.
The text of the exam may not leave the room before the exam is over. (After the exam is over you are encouraged to take the text home and review it.)

Absences, make-ups, and accommodations

If you have a medical condition that influences your ability to take the exams at the regular time, contact the staff in the Disabled Student Services office (DSS) in Room 133, Humanities, 632-6748, at the beginning of the Semester.

If you know in advance that you cannot take a midterm (scheduled medical procedure, etc.), let me know at least three weeks before the exam. A make-up exam will be arranged for you approximately one week before the regular exam time, covering the same material as the regular exam. No make-up exams will be offered for unexpected absences.

In an emergency, an exam absences will be excused. The necessity of an absence must be documented: The advising office can help you with the appropriate documentation. (Please do not provide medical details or other confidential information!) If you have a question about the appropriate documentation, please ask.

If you had an excused absence on one of the midterms and you did not miss any other exam, a properly calculated average of your other grades will replace your midterm grade. An unexcused absence will be assigned a score of zero.

An unexcused absence from the final leads to an automatic F grade. An excused absence from the final exam (assuming you have satisfied all other course requirements) will qualify you for an incomplete grade in the course. A makeup final should be taken early in next semester.

Exam grading policy

Both multiple choice and "physics essay" exam questions will be used throughout the semester. The multiple choice exams will be personalized to each student, so during an exam you must make sure that you are sitting at the exam with your name printed on it. For a "physics essay" exam, mostly given during recitation, it is not sufficient to solve simply solve the algebraic equations needed to reach the answer. You must explain your answer. For typical questions, the following rough guidelines apply (assuming a 10 point grading scale):

- Emphasis is placed on correct reasoning. For full credit, the correct numeric answer and units are not sufficient. An explanation of the solution, with the basic equations and important partial results should be presented. Many questions will require the answer in symbolic form.
- A unit is missing from any value (but your work is otherwise correct): minus 1 point per missing unit.
- Far too many (or too few) significant digits: minus 1 point
- Correct reasoning, correct algebra, but a minor error (but still a reasonable value): full credit minus 1 point
- Correct reasoning, generally correct algebra, but a significant error (outside the correct range of magnitude): full credit minus 2 or 3 points
- Correct reasoning, significant mistake in algebra or inability to solve equations: half credit plus possible extra points.
- Correct equations, nothing more: 1 point credit, possibly less.
- Correct equations, and a bunch of other formulae with no relevance to the problem: no credit.
- Graphs or arguments indicating that you understand the concept, but no solution: up to half credit depending on the quality of the explanation.
It should be emphasized that these are rough guidelines. The specific grading criteria for each problem on an exam will depend on its difficulty.

**The course grade**

Your final letter grade for the course is calculated from the weighted sum of your performance, as follows:

- First Midterm - 20%
- Second Midterm - 20%
- Final Exam - 40%
- Recitation - 20%
- Homework - 5% (extra credit)
- Lecture Clicker Quizzes - 5% (extra credit)

Your recitation grade will be assigned by your recitation instructor within course-wide guidelines. The recitation grades will be based on attendance and quizzes given during each session. The different letter grade assignments will be based on absolute standards (>90% A, >85% A-, >80% B+, >75% B, >70% B-, >65% C+, >60% C, >50% C-, >40% D).

**Academic Honesty**

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary.

An environment of honesty and integrity is important for both the conduct of science and for a constructive learning environment. I expect your honesty in all academic transactions. Students are encouraged to discuss homework problems and issues in the course with each other and with the staff. Indeed, you will find that you learn a great deal from each other. Keep in mind, however, that:

- Cheating on the exams will be reported to the academic judiciary and I will argue for a stiff penalty.
- Homework is intended as a tool to help you think about the material, and to practice solving problems, however, homework submitted for grading must be your own work.
- You are encouraged to discuss the homework with other students and even "solve" the problems together in study groups, but most numeric homework problems are randomized help prevent "accidental" copying.
- In the final analysis, cheating may get you a better grade, but if you fail to learn the material in an introductory course it will harm your future learning experiences.

**Critical Incident Management**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

**Complaints**
I recognize that I make mistakes, and give you an opportunity to help me to correct them. If you feel comfortable bringing an issue to my attention, that is probably the best way to find a good solution. If speaking directly to me makes you uncomfortable, please contact the physics office, or your academic counselor. They will make sure the issue is brought to my attention.

**Fixing Grading Problems**

The graded exams will be returned to you in a recitation session as soon possible after the exam is given, typically one to two weeks. The solutions to the exam problems will be discussed on the same session. You may want to make notes on your exam during the discussion, however, you should use a writing instrument that is *markedly* different from the pen/pencil used during the exam. It must be emphasized, **any marks made on the exam after it has been returned must be made in a clearly different pen/pencil that was used to take the exam.** If an exam is returned for regrading with modifications that are not clearly indicated it will be counted as cheating and dealt with appropriately.

In general, a single problem on an exam will be graded by a single person, and every effort is made to keep the grading uniform. That means that unless there is a grading error, I will not usually change the assignment of partial credit.

- If you believe that the grading of your exam needs reconsideration, talk to your recitation instructor first. Your recitation instructor will correct minor errors like the incorrect addition of scores by the grader, or take the exam for regrading, with a note explaining the problem.

- If partial credit is contested, the whole exam may be re-graded. Your grade may go up, remain unchanged, or possibly even go down. The reason for this is that if one grading mistake was made, it is very likely that the grader was tired and other mistakes were also made.

- Exams will be accepted for regrading only on the same day that you received the graded exam in recitation. You should ask for the re-grading at the end of the recitation session. If you leave the recitation with you exam, the grade is final.

**Medical**

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact Disability Support Services at (631) 632-6748 or [http://studentaffairs.stonybrook.edu/dss/index.shtml](http://studentaffairs.stonybrook.edu/dss/index.shtml). They will determine with you any accommodations that are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following website: [http://www.sunysb.edu/ehs/fire/disabilities.shtml](http://www.sunysb.edu/ehs/fire/disabilities.shtml)

*Maintained by Clark McGrew. Last updated $Date: 2018/01/19 14:33:07$*
# PHY 132 Course Schedule: Spring 2018

Homework assignments are posted on [www.masteringphysics.com](http://www.masteringphysics.com), be sure to check there for homework due dates. The prelecture homework is usually due at midnight on Monday. The chapter homework is generally due at midnight on the following Sunday. The lecture schedule may be updated slightly as the classroom discussion progresses.

<table>
<thead>
<tr>
<th>Monday</th>
<th>Wednesday</th>
<th>Friday</th>
<th>Notes</th>
<th>Reading for the Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Jan 22 (8:00am) -- Electric Charge, Conductors and Insulators</td>
<td>2: Jan 24 (8:00am) -- Coulomb’s Law, Electric Field, Field Lines</td>
<td>3: Jan 26 (8:00am) -- Motion in a Field, Field in a Conductor, Electric Dipoles</td>
<td>No recitations</td>
<td>21-1, 21-2, 21-3, 21-4, 21-5, 21-6, 21-7, 21-8, 21-9, 21-10, 21-11</td>
</tr>
<tr>
<td>4: Jan 29 (8:00am) -- Electric Flux</td>
<td>5: Jan 31 (8:00am) -- Gauss’s Law</td>
<td>6: Feb 02 (8:00am) -- Application of Gauss’s Law</td>
<td>Quiz on Ch 22</td>
<td>22-1, 22-2, 22-3, 22-4</td>
</tr>
<tr>
<td>7: Feb 05 (8:00am) -- Electric Potential, Relation between Field and Potential</td>
<td>8: Feb 07 (8:00am) -- Potential from the Charge Distribution, Equipotential Surfaces, Dipole Potential</td>
<td>9: Feb 09 (8:00am) -- Determining Field from the Potential, Electrostatic Potential</td>
<td>Quiz on Ch 22</td>
<td>23-1, 23-2, 23-3, 23-4, 23-5, 23-6, 23-7, 23-8</td>
</tr>
<tr>
<td>10: Feb 12 (8:00am) -- Capacitors, Capacitance</td>
<td>11: Feb 14 (8:00am) -- Capacitors in Series and Parallel</td>
<td>12: Feb 16 (8:00am) -- Energy in a Capacitor, Dielectrics</td>
<td>Quiz on Ch 23</td>
<td>24-1, 24-2, 24-3, 24-4, 24-5</td>
</tr>
<tr>
<td>16: Feb 26 (8:00am) -- EMF and Terminal Voltage, Resistors in Series and Parallel</td>
<td>17: Feb 28 (8:00am) -- Kirchhoff’s Rules, Series and Parallel EMFs</td>
<td>18: Mar 02 (8:00am) -- RC Circuits, Electric Hazards, Meters</td>
<td>Quiz on Ch 25</td>
<td>26-1, 26-2, 26-3, 26-4, 26-5, 26-6, 26-7</td>
</tr>
<tr>
<td>19: Mar 05 (8:00am) -- Magnets, Magnetic Fields, Induced Fields, Force on a Current</td>
<td>20: Mar 07 (8:00am) -- Force on a Moving Charge, Torque on a Current Loop</td>
<td>21: Mar 09 (8:00am) -- Motors (etc), The Electron, Mass Spectrometer</td>
<td>Quiz on Ch 26</td>
<td>27-1, 27-2, 27-3, 27-4, 27-5, 27-6, 27-7, 27-9</td>
</tr>
<tr>
<td>Mar 12 -- Spring Break</td>
<td>Mar 14 -- Spring Break</td>
<td>Mar 16 -- Spring Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22: Mar 19 (8:00am) -- B-Field for a Straight Wire, Force Between Parallel Wires, Definition of an Ampere and Coulomb</td>
<td>23: Mar 21 (8:00am) -- Ampere’s Law, B-Field in a Solenoid</td>
<td>24: Mar 23 (8:00am) -- Biot-Savart’s Law, Ferromagnetism, Electromagnets</td>
<td>Quiz on Ch 27</td>
<td>28-1, 28-2, 28-3, 28-4, 28-5, 28-6, 28-7, 28-8</td>
</tr>
<tr>
<td>25: Mar 26 (8:00am) -- Induced EMF Faraday’s Law and Lenz’s Laws</td>
<td>26: Mar 28 (8:00am) -- EMF in a Moving Conductor, Electric Generators, Back EMF, Eddy Currents</td>
<td>27: Mar 30 (8:00am) -- Transformers, Power Transmission, Changing Magnetic Flux, Applications</td>
<td>Quiz on Ch 28</td>
<td>29-1, 29-2, 29-3, 29-4, 29-5, 29-6, 29-7, 29-8</td>
</tr>
<tr>
<td>28: Apr 02 (8:00am) -- Mutual Inductance, Self-Inductance</td>
<td>29: Apr 04 (8:00am) -- Energy in a B-Field, LR Circuits</td>
<td>30: Apr 06 (8:00am) -- LC Circuits, LRC Circuits</td>
<td>Quiz on Ch 29</td>
<td>30-1, 30-2, 30-3, 30-4, 30-5, 30-6</td>
</tr>
<tr>
<td>31: Apr 09 (8:00am) -- AC Circuits with an AC</td>
<td>32: Apr 11 (8:00am) -- Resonance in AC</td>
<td>33: Apr 13 (8:00am) -- Impedance Matching, 3</td>
<td>Quiz on Ch 30.1</td>
<td>30-7, 30-8, 30-9, 30-10, 30-11</td>
</tr>
<tr>
<td>Source, AC source LRC Series</td>
<td>Phase AC</td>
<td>to 30.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34: Apr 16 (8:00am) -- Maxwell's Equations</td>
<td>35: Apr 18 (8:00am) -- EM Waves: Production and Properties</td>
<td>36: Apr 20 (8:00am) -- Energy in EM Waves, Poynting Vector, Radiation Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Light as an EM Wave</td>
<td>Quiz on Ch 30.7 to 30.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37: Apr 23 (8:00am) -- Ray Model of Light, Reflection, Image Formation</td>
<td>38: Apr 25 (8:00am) -- Refraction, Snell's Law, Total Internal Reflection</td>
<td>39: Apr 27 (8:00am) -- EM Wave vs EM Particles, Huygens' Principle</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quiz on Ch 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40: Apr 30 (8:00am) -- Interference, The Double Slit Experiment</td>
<td>41: May 02 (8:00am) -- Thin Film Interference, Michelson Interferometer</td>
<td>42: May 04 (8:00am) -- Diffraction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quiz on Ch 32</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This page is maintained by Clark McGrew. Last updated Jan 17, 2018