

# PHYSICS 220 COURSE SYLLABUS: Fall 2010

**Instructor: Branton J. Campbell**

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**Website: <http://www.physics.byu.edu/faculty/campbell/physics220>**

**Lectures: MWF 9:00-10:00AM in 445 MARB**

**Office Hours: MWF 10-11 AM and TTh 4-5 PM**

## COURSE OBJECTIVES

Physics 220 is designed to introduce you to the core concepts of electricity and magnetism and to help you develop sufficient physical intuition and quantitative experience to apply these concepts to simple problems relevant to modern science and technology. You are expected to finish the course better informed about the inner workings of the world around you and better able to make decisions that depend on that information. Coupled with faith and motivation, a familiarity with the foundations of electricity and magnetism will help to prepare you for a successful career and meaningful service.

## TEXTS, TOOLS, and RESOURCES

1. **Course Packet:** includes walk-in lab descriptions, *What does it mean to Integrate?* by Ross Spencer, Study Guide, *Formulas and Chapter Summaries* by Ross Spencer, sample exams, homework problem descriptions.
2. **Text:** Physics for Science and Engineers, by Raymond Serway (7<sup>th</sup>, 6<sup>th</sup> or 5<sup>th</sup> editions). This text may be purchased as one large book (which is used for Physics 121, 123 and 220) or a thinner custom paperback version covering only Physics 220. An online version of the textbook is also available from the publisher.
3. **Course website:** This site contains links to course and grade administration features, updated class schedules, and announcements that supercede any printed information in the course packet or in-class handouts. Please check it often.
4. The **Tutorial lab** is located in N361 ESC. Teaching Assistants will be available there at posted hours Monday through Saturday. Check to see who the 220-specific TAs are and check the schedule to see when they work. This is a great place to study, receive individual help, work on homework assignments, meet other students, and work as a group.
5. **Peers.** You are encouraged to study in groups. If you feel that you are not able to participate in or lead discussion, you may need a new study group.
6. **Calculator:** You will need a calculator for exams and homework problems. Any scientific calculator will do. Because calculators and computers are tools of the trade in any scientific or technological field, you should learn how to use the most sophisticated equipment available to you. But don't waste money on equipment that you won't use. Note that PDAs and laptops may not be used on exams.
7. **CIDs:** All quiz, homework, lab, and exam grades are recorded according to a class identification (CID) number. Your number has been chosen for you and mailed to your Route Y address. Memorize your CID and record it on all submitted work where you would normally put your name. Work submitted without CID numbers will not be graded.
8. **Electronic Quiz Transmitters:** Purchase an iclicker at the bookstore in order to take our in-class quizzes.
9. **Exam solutions** will be distributed in class after each exam. If you have questions about these solutions, you may visit the instructor during office hours.
10. **Mechanical Universe** videos. These media resources contain illustrations and demonstrations that will appeal to visual learners, as well as a wealth of historical and anecdotal information. You can view them online at your convenience at <http://www.learner.org/resources/series42.html>.

## PREREQUISITES

1. Math 112 is absolutely required. Math 113 is recommended. If you feel that you need to review Calculus, check out Quick Calculus (Kleppner, QA303 .K665 1985) at the reserve desk.
2. Physics 121 or CE 103 completed and CE 204 concurrent.

3. Basic math skills are reviewed in Appendix B of your text. Vectors were covered in Physics 121, and will be briefly reviewed in class. Aspects of Math 214 and 343 are used, though these classes are not required.

### **EXPECTATIONS**

1. Plan on 10-12 hours each week. You may require more time if your physical intuition is not well developed. A good indicator may be how well you do on 'story problems', as they are the bulk of your homework and tests. A few students will require less time. If you do not feel that you have enough time to dedicate to this class right now, consider taking it another semester.
2. Keep up. Reading, study guide, and homework assignments come due each class period. The concepts in Physics 220 are cumulative, even more so than in other science classes. If you do fall behind, then talk with the instructor immediately to get help.

### **REQUIRED READING, STUDY GUIDE, and IN-CLASS QUIZZES**

1. In-class quizzes will be submitted using an iclicker, which you can purchase from the bookstore. Quizzes cannot be made up. But your lowest four quiz scores will be automatically dropped.
2. Because quiz questions are presented spontaneously, there is no way to know how many quiz questions the instructor might ask during a given class period. Your responses to most quiz questions will earn one participation point, regardless of your answer. Occasionally, the instructor may choose to award one extra point for the correct response. If you don't submit a response, you don't earn any points.
3. Reading assignments include sections from your text (Serway, *Physics for Scientists and Engineers*) and from your course packet as indicated in the class schedule.
4. Study Guide (SG) units walk you step by step through representative homework and exam problems on topics covered in the most recent lecture. Work through the study guides frame by frame. Cover up the solutions as you work the problems, and correct yourself as you go. Your SG work does not have to be neat -- rough notes are acceptable as your time is valuable. But you should save and organize your work for use in preparing for exams.
5. At the beginning of each class period, the 1st quiz question will always be, "Did you complete at least 50% of the required reading and at least 50% of the study guide assignment?" This question will be graded (2 pts for "yes", 1 point for "no"), and you are on your honor to be honest.

### **WALK-IN LABS**

1. In the course packet you will find walk-in lab sheets for twelve short laboratory experiments. The labs are very important and include concepts that will be tested on. Do not miss doing them! Each lab will be available in Room S415 of the ESC for a 1 (or occasionally 2) week period, beginning on Saturday morning and ending on Friday night.
2. The lab reports are due in the 220 homework/lab submission bins located across from N375 ESC by 9:00 pm on Friday night on the date indicated in the class schedule. Lab reports are to be submitted in the bin corresponding to the first digit of your CID. Work without a CID will not be graded. After grading, your lab reports will be returned to the adjacent distribution bins according to the first two digits of your CID.

### **HOMEWORK**

1. Homework assignments will be submitted online via links on the course website, which requires your CID and the last four digits of your BYU ID for access. The homework problems are found in your course packet, and require input data that is unique to your CID (also accessed via the course website).
2. Each part of a multi-part problem is worth 2 points and is scored independently. You only get one attempt at a multiple-choice problem; if you leave it blank on the first attempt, it will be marked wrong.
3. Numeric problems are worth 2 points each. Each part of a multi-part problem is worth 2 points and is scored independently. After an initially incorrect response, a numeric problem can still be resubmitted two more times without penalty, for a maximum of three tries. When you submit an incorrect answer, the online homework system will give you the correct answer along with new input data to be used in your next attempt. Thus the correct answer will be different for each attempt. If you have only answered some of the

parts correctly, only the incorrect responses need to be resubmitted. Once you get a part correct, the system will protect you from yourself by ignoring any subsequent changes that you make to that part.

4. Numeric response ranges: Each numeric problem description includes (1) upper and lower bounds for the response, the numeric precision required, and the physical units expected. If your answer falls outside the range indicated, you have likely made a mistake. Because computerized grading systems can be very exacting, we have provided this information to you to make your online homework experience more pleasant. Carefully read the *Online Homework Submission Tips* guide available on the course website for more information about the online grading system. Check twice -- press enter once. Please don't appeal for points lost due to miscalculations, round-off errors, typos, etc.
5. Hand-written homework problems: Some homework assignments will require written work that must be submitted to the Physics 220 homework/lab submission bins located across from N375 ESC. Place your work in the bin corresponding to the first digit of your CID. Work missing a CID will not be graded. After grading, your written work will be returned to you in the adjacent distribution bins according to the first two digits of your CID. These problems will be accepted late for half credit.
6. Homework due dates: Both online and written homework submissions are due 15 minutes before class starts on the dates indicated in the class schedule, at which time solutions will be posted in the display cases across from N361 ESC for one week. You may submit homework problems at any time during the semester up until midnight on the last day of class. However, any points earned after the corresponding due dates are considered late and only receive half credit.
7. Forgiveness: Up to four late homework assignments are forgiven automatically. They are selected automatically by the grading system in such a way as to maximize your cumulative homework total.
8. Notes. You are **STRONGLY** encouraged to keep neatly written copies of all your homework problems. If you don't, it will be very difficult for you to figure out what mistakes you have made, or to study your homework in preparation for exams.
9. Do not share homework responses with other students before the solutions are posted unless you worked together to obtain those responses. Group study is encouraged. Helping others to learn material that you have mastered is encouraged. Giving out answers, on the other hand, is not acceptable.

## **MIDTERM EXAMS**

1. Midterm exams will become available in the testing center on the dates associated with the exam reviews conducted in class (see the class schedule), and remain available until closing time on the following class day. While exact starting and ending times will be available via RouteY, you might want to become familiar with the testing center schedule. Mid-term exams are not time limited. The average time spent is usually approximately two hours. Do not accidentally miss an exam -- there will be **no late exams** given except in verifiable emergencies.
2. Midterm exams will usually contain about twenty machine-graded multiple-choice questions and five written-response (similar to homework) and/or essay questions which will be hand-graded. You may use your copy of *Formulas and Chapter Summaries*, a scientific calculator (no PDA), and scratch paper. Students whose native language is not English may use a foreign language dictionary. It is common for several of the exam problems to come right out of the sample exams in the packet. Each exam will include problems requiring calculus.
3. Exam 1 is a math review test and carries only half the weight that the other midterms carry.
4. Midterm exams will be returned to you in the distribution boxes to the right of the 220 homework submission bins. You must put your CID on all exams or lose points.
5. Do not discuss the problems or answers to a current exam with other students until after the exam solutions have been distributed in class.

## FINAL EXAM

1. The final consists of roughly 40 multiple-choice questions similar to those on the midterms.
2. The final exam is comprehensive, though the new material following Exam 5 will be emphasized (25%).
3. The final exam will be available in the Testing Center during the normal final exam period. There is no time limit, except closing time. The final exam is confidential and will not be returned to you, though you may review your exam with the instructor in person.
4. As with the midterms, prepare by working through the sample exam problems in the course packet.

## GRADES and GRADING

1. Many students want to see how they are doing and more importantly to know that we have recorded their scores properly. Scores can be accessed confidentially on the course website using your CID and the last four digits of your BYUID. They will be updated every evening after the first two weeks of school.
2. If you feel that your work was unfairly or incorrectly graded, or if you notice other problems with your grades, you should either submit a written appeal in the 220 APPEALS box (near the homework submission boxes) or visit your instructor during their office hours. Any appeal should be started within one week after you receive the graded work or after a prior appeal is returned.
3. Final grades are determined according to the following breakdown:

Quizzes (42 quizzes)	5%									
Walk-in labs (12 experiments)	5%									
Homework (35 assignments)	30%									
Midterm exams (5 exams)	40%									
Final exam	20%									
<b>TOTAL POSSIBLE:</b>	<b>100%</b>									
Score 90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%
Grade A	A-	B+	B	B-	C+	C	C-	D+	D	D-

## OTHER NOTES OF INTEREST

**Honor Code Standards:** In keeping with the principles of the BYU Honor Code, students are expected to be honest in all of their academic work. Academic honesty means, most fundamentally, that any work you present as your own must in fact be your own work and not that of another. Violations of this principle may result in a failing grade in the course and additional disciplinary action by the university. Students are also expected to adhere to the Dress and Grooming Standards. Adherence demonstrates respect for yourself and others and ensures an effective learning and working environment. It is the university's expectation, and my own expectation in class, that each student will abide by all Honor Code standards. Please call the Honor Code Office at 422-2847 if you have questions about those standards.

**Harassment:** Harassment of any kind is inappropriate at BYU. Specifically, BYU's policy against sexual harassment extends not only to employees of the university but to students as well. If you encounter sexual harassment, gender-based discrimination, or other inappropriate behavior, please talk to your professor, contact the Equal Employment Office at 422-5895 or 367-5689, or contact the Honor Code Office at 422-2847.

**Disabilities:** BYU is committed to providing reasonable accommodation to qualified persons with disabilities. If you have any disability that may adversely affect your success in this course, please contact the University Accessibility Center at 422-2767. Services deemed appropriate will be coordinated with the student and instructor by that office.

**Children in the Classroom:** The serious study of the physical and mathematical sciences requires uninterrupted concentration and focus in the classroom. Having small children in class is often a distraction that degrades the educational experience for the entire class. Please make other arrangements for child care rather than bringing children to class with you. If there are extenuating circumstances, please talk with your instructor in advance.