

## **PHYSICS 221 -Spring 2007**

### **PHYSICS WITH CALCULUS Section 1**

**PHYSICS 221** is the first semester of the Calculus based introductory physics sequence for students majoring in engineering and the sciences. Kinematics, dynamics, fluid statics and dynamics, and thermodynamics with no assumption of prior knowledge of physics are covered. Students normally should take PHYSICS 271, the accompanying laboratory course, the same semester. {PHYSICS 231 is a supplemental one credit course offered during the Spring semester that is designed to address the needs of students majoring in sciences and prepare them for upper-division physics courses in mechanics and thermodynamics}. Prerequisite: MATH 131, MATH 107, or HONR 107 (May be taken concurrently with MATH 131 with the permission of the Head of the Department of Physics).

**Instructor:** Col. Saul J. Adelman

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**Office Hours:** nominally 8:30-5:30 when not in class

**Text:** Physics for Scientists and Engineers with Modern Physics by Raymond A. Serway and John W. Jewett, Jr. (Chapters 2-15 and 19-20 except for those sections covered by PHYSICS 231). We will cover the material in the text's order except for inverting Chs. 2 & 3. You should consider purchasing The Student's Study Guide and try the web site for the text. Chapter 1 is considered useful background reading. Also look at the covers and the appendices.

**Class Hours:** Section 1: MWF 9

Grimsley Hall 112

**Tests:** Four or five tests, each covers two or three chapters. The lowest test grade will be dropped if there are five tests. The final exam serves as a test for the remaining chapter(s) and as a comprehensive review. The tests will be held as soon after the relevant problem sets are covered as possible. These problems almost always will involve algebra rather than calculus. Only if you have an excused absence for two missed exams will you be allowed to make up the second exam. **There will be no make-up tests for students who miss just one test.**

**Problem Sets:** Each chapter has its own problem set. Due dates will be announced. Please write the solutions in an orderly fashion preferably in order of assignment. Please box or

underline your solutions. There are many other problems in the text that are not required to be turned in. Some of these or modifications thereof as well as text examples may appear on your tests. We cover material from up to 17 chapters and have 42 class periods. With allowance for tests, a problem set will be due almost every other class period. **At least 75% of the work you turn should be your own thinking.** Thus you can receive some help and should get it when necessary. **WARNING: A GROSS VIOLATION OF THIS LIMIT FOR CADETS IS A VIOLATION OF THE HONOR CODE.**

The professors of the Physics Department strongly believe that you need to work problem sets. Please realize that the grading of problem sets is a time consuming task. Solutions will normally be provided the class period after they are due. In some cases they will be provided the date they are due. Due to the number of students, problems turned in late are unlikely to receive any credit except for excused absences.

**Your professor wants to see all key steps in solving each problem. Solutions with just the answers will be given minimal partial credit.**

**Help:** Your instructor will be happy to provide some help. There is also a physics tutor and there are many cadets who have successful past this course.

**Grades:** Grades will be given according to the standard Citadel system. Approximate guidelines are as follows:

Problem Sets:	20%
Tests:	50%
Final Examination:	30%

**Calculators:** You are expected to own an operating electronic calculator with trigonometric functions. But during exams you may not exchange calculators with your fellow students. You need to show the primary steps of your work even if you have a calculator that permits you to skip major steps.

**Odds and Ends:** Be sure to show all work on exams and homework problems. Please start all problems by writing down what is known and making a cartoon if appropriate. Then perform an analytical solution before calculating numerical values. If you start problems in the logical middle of the solution even if the final solution is correct, you will not receive full credit.

**Cell phones are not permitted in any examination and must be off in class. During lecture the reading of materials other than those for the physics course or its laboratory can result in their disposal by the professor.**

I am open to constructive suggestions on how to improve this course. We will use primarily S.I. units. I demand a lot of work, but if you are to succeed in mastering this subject you need to work hard.

**Problems:**

<i>Chapter 3: 3, 24, 44, 51, 58 and Chapter 7: 9 and Chapter 11: 6</i>	(7)
Chapter 2: 22, 29, 36, 45, 51, 63	(6)
<i>Chapter 4: 7, 18, 32, 37, 46, 65</i>	(6)
Chapter 5: 11, 21, 30, 42, 49, 64	(6)
<i>Chapter 6: 9, 14, 20, 55, 65, 68</i>	(6)
Chapter 7: 20, 28, 32, 42, 52, 57	(6)
<i>Chapter 8: 9, 24, 29, 37, 48, 68</i>	(6)
Chapter 9: 5, 15, 27, 30, 38, 60	(6)
<i>Chapter 10: 2, 11, 29, 34, 60, 66</i>	(6)
Chapter 11: 19, 20, 26, 30, 31, 32	(6)
<i>Chapter 12: 8, 15, 23, 34, 46, 54</i>	(6)
Chapter 13: 3, 16, 28, 40, 44, 62	(6)
<i>Chapter 14: 12, 25, 30, 44, 52, 53</i>	(6)
Chapter 15: 1, 18, 39, 54, 61, 72	(6)
<i>Chapter 19: 16, 21, 33, 38, 45, 53</i>	(6)
Chapter 20: 9, 15, 32, 39, 41, 47	(6)

