General Physics Syllabus (Physics 213)

Meeting Time: 9:00-9:50 Lewis Hall Rm. 101
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Office Hours: Monday - 3:00-4:00 p.m., Tuesday 8:00-9:00 a.m., Thursday 3:00-4:00 p.m. in the Tutoring Center (Lewis Hall Rm. 104). If you need to meet with me at some time other than my normal tutoring hours, see me after class and schedule an appointment.

Course Objectives: The word **physics** is a Greek word that translates as "nature." In the study of physics, experimentation and the observation of physical phenomena are used to formulate concepts, theories and physical laws that describe the universe in which we reside. Around the 17th Century, it was discovered that the concepts that describe the nature of the universe are often connected through specific mathematical relationships. Thus, mathematics is an essential tool for the study of physics, because it enables us to predict and describe how a given physical situation will change and evolve.

In this class, we will begin by defining the core concepts (axioms) of physics and working to develop an understanding of the relationships among them. We will then build on these "axioms of physics" to develop new (often mathematical) concepts and ideas that will enable us to describe the physical world. There are two main goals for this class. The first is that you develop a deep understanding of these concepts and relationships. The second goal is that you develop the critical thinking and problem solving skills needed to apply your understanding to the solution of physical problems.

Class Text: The text for this course is Giancoli's Physics, 6th edition.

Supplies: In addition to the text, you will need a notebook (for taking lecture notes) and pen or pencil. I recommend a 3 ring binder with college ruled notebook paper, dividers, and a pocket folder for handouts. A ruled straight edge (with centimeter and millimeter divisions) will be useful. A basic scientific calculator also is required. Your calculator should have **NO Programming or Graphics functionality,** however it should have trigonometric and logarithmic functions.

Optional, but recommended, is a card file and a set of 3 x 5 index cards for flash cards to help you learn the definitions and core concepts of physics.

Common Courtesy Guidelines: It is expected that you will show up to class **on time.** It is very rude to interrupt the class by entering late. Also, be sure that all pagers, cell phones, and beeping watches are turned OFF before entering the class.

Attendance Policy: Attendance is not mandatory, however it is **strongly** encouraged. If you fail to attend a lecture, you are responsible for all the material covered in that lecture. If you miss a class when a test or quiz is given, you will receive zero credit for that test or quiz.

Academic Integrity: Cheating will not be tolerated. If anyone is caught cheating they will fail this course.

Handouts: This course is Blackboard enabled. Within 24 hours of class, I will place pdf files on blackboard for you to download, print, and bring to class. Some times I may just ask you to turn in that day's handouts for a quiz grade (i.e. you get 10 points or a 0).

Notes (from lectures and reading assignments): I cannot emphasize enough the importance of complete and well-organized notes. When you come to see me with questions about homework, I will first ask you to show me the relevant sections of your notes and have you explain them. It is **EXPECTED** that you will read the text and study your (text and lecture) notes before attempting the homework problems. Therefore, if you have questions about material in the text or in your notes, you should come see me (or one of the tutors) for help with that material before starting on the homework.

Reading Assignments: At the end of most lectures, you will be given a reading assignment for the next class. I expect you to read actively, taking notes covering the assigned sections (we will discuss how to read and make notes later).

Quizzes and Reading Assignments: There will be a number of unannounced, **comprehensive** pop quizzes given throughout the semester. These will be short, concept/definition oriented quizzes. Often I will ask class members to remind me what the definition of a particular term is. If I ask you to tell me what something means, and you don't remember, that will likely prompt a quiz for the entire class. As we conclude each chapter, I will place a worksheet on the web which has all the definitions you must know, concepts you must be able to explain, pictures you must be able to draw, etc… for the quizzes. Once you are given a worksheet, you will be expected to know that material for the rest of the semester.

Homework: You should begin working on the homework as soon as you can, because it will take some time to complete. There will be two different types of homework assignments, online and on paper. You will need to point your web browser to

http://phga.pearsoncmg.com/phga2/classes/mcpherson213/

in order to complete the online assignments. Note, that online assignments will only be available for a few days after they are assigned. To receive credit for an assignment it must be completed within the alloted time.

You may work in groups, or receive help from the tutors or other students. However, struggling with the problems and working them out on your own will help you learn the material. If you simply copy your friend's homework, you will deprive yourself of that learning experience. Your homework grade may increase, but most likely your test grades (note the plural) will decrease. Try to work as many of the problems as you can on your own before seeking help. As the great swordsman and philosopher Musashi observed, "He who sweats the most in training bleeds the least in battle." If you don't practice to develop the skill of working physics problems, you will pay for it when the test time arrives. Some people will learn more quickly (and others more slowly) than average, but as a general rule, most people in this class should plan on spending a **minimum** of 10-12 hours per week devoted to the study of physics. Yes, that is a significant investment of time. However, if that's what it takes for you to learn the material, your choices are to drop the class, do the work necessary to pass the class, or to fail the class.

Written Homework must be turned in on time!!! Homework will not be accepted late (and 5 minutes past the hour is late). If you do not have the homework completed on time, you will not receive credit for it. (However you may have a friend turn it in for you if you must miss class.)

Noté bien: To receive credit on homework it must be neat and legible. I will instruct the grader to give a zero to any problem that is not immediately legible. Write neatly. A proper homework problem should:

a) State the problem
b) Draw a clear diagram (make it large enough to be clear) of the situation with all parts labeled (we will discuss how to make proper diagrams in class)
c) Indicate the nature of each quantity (for example, vectors or scalars)
d) Include proper units in every step and convert all quantities to units that are common.
e) State any assumptions that you are making, such as, "Here, the force due to air resistance has been ignored."
f) Show the equations defining the relationships between what is known and what is unknown (i.e. the solution to the problem), and work through to the solution of the problem.
g) Clearly indicate (drawing a box around it would be helpful) your solution to the problem.
h) Solutions should have the correct number of significant figures.

Tests: There will be 3 tests given over the semester. Like the quizzes, each test will be comprehensive. The tests will be problem oriented. In general, the problems will come from the material covered in the lecture notes, reading assignments, and homework assignments. However, they will be designed to test your understanding of the material, not your ability to memorize a bunch of problems by rote. The tests will be closed note/closed book. You should bring yourself, a pencil (or pen) and a calculator. Paper will be provided.

Final Course Grade:
The 3 Tests will count for 100 points each, as will the average of all your quiz grades
The Homework will count for 200 points and the final will count for 200 points (i.e., there will be 800 total possible points)

The grading scale is based on the following percentages:

90 – 100	A
80 – 89.99	B
70 – 79.99	C
60 – 69.99	D
Below 60	F

Grading Philosophy: I will do my best to **assign the grade you earn**. There will be **NO CURVE OR DROP GRADES**.

Periodically throughout the semester, there will be opportunities for extra credit work. Extra Credit is optional, but it can be useful. A potential total of 40 extra credit points (1/2 a letter grade) will be made available through a variety of extra assignments.

Aug 23	Introduction, Syllabus, Course Outline and Requirements, Lab Procedures, Mathematics Diagnostic Test, and Introductory Physics Presentation
Aug 25	1-4 Measurements and Uncertainties: Significant figures 1-5 Units, Standards and the SI System 1-6 Conversion of Units Handout: Course Supplement: How to Study Physics Handout: How to Read your Physics Text with Understanding
Aug27	2-1 Reference Frames and Displacement 2-2 Average Velocity 2-3 Instantaneous Velocity (with concepts from calculus!) 2-4 Acceleration **Notes From History: Galileo**
Aug 30	2-5 Motion at a constant acceleration 2-6 Solving Kinematics Problems 2-7 Falling Objects 2-8 Graphical Analysis of Linear Motion
Sept 1	3-1 Vectors and Scalars (note, I will be covering vectors a little differently from your text) Definition of Scalar and vector quantities (3 requirements for a vector) Graphical Representation of vectors Multiplication of vectors by a scalar The "Zero" Vector Graphical Addition of n vectors (Triangle Method)
Sept 3	Algebraic Representation of vectors (Cartesian and Plane-Polar) The Cartesian unit vectors Algebraic addition and subtraction of vectors Resolution of a vector into Cartesian components
Sept 6	Labor Day Holiday – School is Out ☺
Sept 8	3-6 Projectile Motion 3-7 Projectile Motion is Parabolic
Sept 10	3-8 Relative Motion Extra Topic: The Galilean Transformation 4-1 Force Extra Topic: The Four fundamental Forces of Nature
Sept 13	**Notes from History : Sir Isaac Newton:** 4-2 Newton's first Law 4-3 Mass 4-4 Newton's Second Law of Motion 4-5 Newon's Third Law of Motion 4-6 Weight and the Normal Force
Sept 15	4-7 Solving Problems with Newton's Laws – Free-body Diagrams
Sept 17	4-8 applications involving friction and inclined planes 4-9 A general Approach to Physics Problem Solving
Sept 20	5-1 Kinematics of uniform circular motion 5-2 Dynamics of uniform circular motion 5-3 Highway Curves
Sept 22	***TEST #1***
Sept 24	5-4 Nonuniform Circular Motion Extra Topic Force and Motion revisited, the inertial frame Appendix C: Rotating Frames of Reference, Inertial Forces; Coriolis Effect
Sept 27	Last Day for Course Withdrawl! Applications for December Diplomas Due.