Cedar Crest College
PHYSICS 101
(4 credit hours)
Fall Semester, 2008

Instructor Dr. Anthony Verbalis
Miller Building 7
Phone: x3324

Class Periods Miller Building 33: Monday, Wednesday and Friday; 11:00-11:50 AM

Laboratory Miller Building 21

Office Hours Monday 1:00 - 3:00 PM
Friday 10:00 AM – 11:00, or by appointment at other times.

Textbook College Physics---Giambattista, Richardson, Richardson; 2nd edition
Physics 101 Laboratory Manual---A. Verbalis

Welcome to Physics 101. The subject matter in this course is known as classical mechanics. This will help us to describe and understand the laws that govern the motion of objects. Motion (or its absence) is a very important aspect of the world that we can see, and also of the submicroscopic world that we cannot see. By extending the principles discovered on a macroscopic level, classical mechanics provides a starting point for the basic understanding of microscopic natural phenomena.

Historically, classical mechanics is where physics began, and its originator, Sir Isaac Newton, is sometimes called the first physicist. Today, there is a more general theory of mechanics called relativity, which was formulated by Albert Einstein. It is important to note that this development does not invalidate the theory of classical mechanics unless speeds approach the speed of light. Relativity does not contradict the results of classical mechanics in the realm of more ordinary speeds.

In the 20th century, study of microscopic phenomena has produced a more general theory called quantum mechanics. It too reduces to the simpler Newtonian mechanics for objects larger than molecules, but is absolutely required to account for behavior on the atomic scale. Today, classical mechanics is but one of many branches of physics. Whatever branch, physics remains true to its origin in trying to understand the workings of the material world (matter and energy), at its most basic levels.

While there is of course more to life than just the material world, it would be foolish to ignore it. Physics is one very important type of inquiry into the nature of the world in which we find ourselves, and often serves as a model for other sciences. In addition, it is the basis for a wide variety of careers in our technological society. I hope to convey to you that classical physics is a remarkable intellectual achievement, and that it is both useful and enjoyable to have a clearer understanding the laws governing the behavior of matter and energy.

COURSE OBJECTIVES

As a result of the study necessary to complete this course, students should gain an increased conceptual understanding of the laws which govern motion, with an attendant decrease in common misconceptions. They will increase their ability to apply these laws in their quantitative forms to obtain insight and solutions to problems involving matter and energy. These problems will often be of practical interest, with relevance to other sciences. In other cases, they may be relevant to the theoretical understanding of basic physical concepts. In the laboratory, it is intended to increase the student's skill and confidence in performing careful measurements, and interpreting the meaning of results obtained.

OUTCOMES AND ASSESSMENT

The successful achievement of the objectives stated above is intended to result in the outcomes of greater critical thinking ability, quantitative reasoning skills, and scientific literacy. The means for assessing success at achieving these outcomes will be testing, involving verbal explanations of concepts, and quantitative problem solutions involving these concepts. The laboratory experience will be assessed by evaluating a series of written reports on various laboratory topics.

GRADING POLICIES

Grading will be based on quizzes, homework, laboratory grades, and a comprehensive final exam. The number of points that could be earned in each category will be apportioned as follows:

Quizzes (10 highest)- - - - - - - - - - - 250 points
Laboratory - - - - - - - - - - - - - - - - - -150 "
Laboratory Quizzes - - - - - - - - - - - - 30
Final exam - - - - - - - - - - - - - - - - - -140 "

Total - - - - - - - - - - - - - - - 570 points

The final grade will be determined by the percentage of total points actually earned by the student of the total possible points that could have been earned (usually 570). There will not be any opportunities for earning extra credit.

In assigning letter grades to the final percentages, the percentages for the boundaries between higher and lower letter grade categories will be at most:
A-B, 90 %. B-C, 81%. C-D, 72%. D-F, 65%.

In the event that inclement weather causes the College to be closed when the final exam is scheduled, the final exam will not be rescheduled. In that event, the final percentages will be determined from the quizzes, laboratories, and lab quizzes, which total 430 possible points.

However, in the normal course of events, everyone is required to take the final exam. Your obligations for this course include attendance at the final exam, on the day and time

scheduled by the Registrar's Office. You should not make travel arrangements until the final exam is published; if your make plans early, you should schedule your travel after the last final exam day.

In order to understand the concepts of physics, much emphasis will be placed on solving quantitative problems based on those concepts. Therefore, the written assignments are an important part of the course. They however will not be collected and graded. Solution sheets will be provided to each student after the due date of the assignment, and I will be available for a questions at various times throughout the week. Being able to do the assigned questions and problems will be crucial for being able to do well on the quizzes and final exam. Assignments will generally be due on Wednesday.

The written quizzes will be about 20 minutes long and worth 25 points apiece. They will be given approximately on a weekly basis, and generally during the Monday class period. If more than ten quizzes are given, the ten highest grades will be used when computing the final quiz grade. If a quiz is missed, it will be considered the quiz grade that is dropped in order to arrive at the ten highest grades. No makeup quizzes will be offered once the quiz is graded and returned (usually the class period following the quiz). If a quiz is missed and the student can provide a valid excuse, the final quiz grade percentage for that student may need to be based on fewer than ten quizzes.

The subject matter of the quizzes can be in the form of quantitative problems, questions requiring verbal explanation, and multiple choice questions. The material will be drawn explicitly from the topics covered in class or lab the week before the quiz, and implicitly from material previous to that. The quiz will contain quantitative problems and conceptual questions. The problems will frequently be based on the problems assigned for homework, but not identical with them. In addition, the problems and questions can be based on examples worked out in lecture, and also based on the laboratory exercises.

For the quizzes and final exam, an equation list will be supplied. Physics is not about memorization. What is important are concepts, and how they are applied and interrelate.

The laboratory experiences are intended to reinforce the concepts discussed in class. They are also intended to demonstrate the essential connection between theoretical prediction and empirical verification, which is of crucial importance in all of the sciences. The grade for each lab exercise (15 points maximum) will be based on the written report, and can also depend on the instructor's assessment of a student's performance in the laboratory. Any absence must be excused, and in that case, the number of possible points that a student can earn (570 points) will be reduced by 15 points. An unexcused absence forfeits the 15 points with no change in the maximum total of 600 points. There will be no makeup laboratories.

The final examination will be cumulative, and based on lectures and laboratories. There will be additional emphasis on concepts discussed near the end of the semester, especially those topics which were introduced after the last short quiz.

LABORATORY WORK

The laboratory is an important and integral part of the course. It is the place where we come into direct contact with physical reality. It is central to the philosophy of physics in that laboratory experiments are the final judge of what will be accepted as physical law. And for students, laboratory work can be greatly useful in understanding accepted physical theories and their implications.

Discussion between students during an experiment in the laboratory is encouraged, but during the preparation of the lab report, each student must express her own ideas based on her own understanding. Most lab reports can be completed during the laboratory period, However, if additional time is needed to complete the analysis and questions, lab reports can be turned in as late as Monday of the following week. It is strongly encouraged to do as much work in the lab as possible. I take a dim view of answering questions concerning the lab if I judge that the student did not make maximum use of the time scheduled for laboratory. The grading of each report will depend on the instructor's evaluation of the student's performance in the lab as well as what appears in the report.

ACADEMIC STANDARDS AND CLASSROOM PROTOCOL

I will follow the guidelines on Community Standards for Academic Conduct, Classroom Protocol, and Honor Philosophy as set forth on the last page of this syllabus, and will expect compliance by all students.

In addition, I would like to emphasize certain aspects of policy in regards to classroom protocol. I place great weight on behavior which enhances, and does not detract from, the learning environment in the classroom. Once class starts, I expect a minimum of distraction from conversation, coming to class late, habitual leaving and re-entering the classroom for no compelling reason, or leaving the classroom before the class has ended. If you know that you will need to leave before the end of the class period, the proper procedure is to notify me of this before the class starts, and when the time comes to leave, raise your hand so that I may excuse you.

If I experience problems in this regard, I reserve the right to make deductions from the student’s point total, depending on the severity and persistence of the problem.

However, any the above should not be construed as reasons to be inhibited from asking questions during class about the subject matter. I welcome such questions. It is inevitable that your understanding at times will not keep pace with the rate at which I proceed, despite my intention to the contrary. At those times, it makes good sense for you to ask questions to be able to understand the concepts. In that way, you will be prepared to understand additional material based on those concepts and keep confusion to a minimum. Also, if at any point in class you think that I am making a mistake in a calculation, please inform me so.

Finally, I am committed to helping you to learn physics. It will require hard work, but please be aware that nothing would please me more than the success of every single student in this class.

SCHEDULE AND READING ASSIGNMENTS

Week of:	Reading Assignment		New Topics
Aug 25	1.1-1.9		Units, Mathematics and Graphs
Sept 1	2.1-2.4	HW #1	Forces, Vectors, Law of Inertia
Sept 8	3.1-3.2, 2.5-2.9 Quiz 1 (Monday)	HW#2	Velocity, Acceleration, Force Diagrams
Sept 15	3.3-3.5 Quiz 2 (Monday)	HW#3	Newton's 2nd Law, Mass, Relative Velocity
Sept 22	4.1-4.6 Quiz 3 (Monday)	HW#4	Accelerated Motion, Air Resistance
Sept 29	5.1-5.5 Quiz 4 (Monday)	HW#5	Circular Motion
Oct 6	6.1-6.4 Quiz 5 (Monday)	HW#6	Work, Conservation of Mechanical Energy
Oct 13	6.6-6.8	HW#7	Springs: Forces and Potential Energy, Power
Oct 20	7.1-7.8 Quiz 6 (Monday)	HW#8	Conservation of Momentum, Collisions
Oct 27	8.1-8.5, 8.7 Quiz 7 (Monday)	HW#9	Rotational Inertia, Torque, Rigid Equilibrium
Nov 3	9.1-9.6 Quiz 8 (Monday)	HW#10	Fluid Pressure, Archimedes Principle
Nov 10	9.7-9.10, 10.1-10.4 Quiz 9 (Monday)	HW#11	Fluid Flow and Viscosity, Solid Deformation
Nov 17	10.5-10.10 Quiz 10 (Monday)	HW#12	Oscillations
Nov 24	11.1-11.4 Quiz 11 (Monday)	HW#13	Wave Motion
Dec 1	11.6-11.10, 12.1	HW#14	Standing Waves, Sound Waves, Doppler Effect
Dec 8	12.7-12.8		

Laboratories will not meet on the weeks of Oct 13, and Nov 24.