Cedar Crest College
Physics 101
(4 credit hours)
Fall Semester, 2009

Instructor: Mr. William L. Landis
Miller Building Room 7
Phone x 3324

Class Periods: Oberkotter Lecture Room: Monday, Wednesday, Friday (11:00-11:50 a.m.)

Laboratory: Miller Building 21

Office Hours: Monday, Wednesday, Friday (9:00-10:30 a.m.)

Text Book: *College Physics,* -Giambattista, Richardson, Richardson; 3rd 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 of 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 that 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, tests, homework, laboratory grades, and a comprehensive final exam. The percentage each category contributes to the final grade will be apportioned as follows:

Tests:	40%
Lab:	30%
Homework:	10%
Quizzes:	5%
Final Exam:	15%

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 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.

In order to understand the concepts of physics, much emphasis will be placed on solving quantitative problems based on those concepts. Therefore, the problem assignments are an important part of the course and will be collected and graded. Because these assignments are for practice, they will not be scored for correctness, but rather by the quality of the strategy and presentation of the physics used to get an answer. I will be available for questions by e-mail or during office hours. Being able to do the assigned questions and problems will be crucial for being able to do well on the tests and final exam. Assignments must be submitted on or before the due date. There will be no exceptions. Solutions will be posted the day after the due date. There may be special assignments. These assignments will be assigned a due date and will be graded.

There will be a short quiz given promptly at the beginning of each lecture. The quiz will be based on the study section assigned for that date. Questions will be on power point slides. There will be no provision for those arriving late to make up the quiz or questions missed. The quiz will only take five minutes after which the lecture will begin.

The major tests will be on the assigned dates and will cover the material indicated. They will consist of a mix of conceptual questions and quantitative problems. Due to the limited amount of class time, part of the test may be given as "take home" at the discretion of the instructor. Only a valid excuse from the dean's office will allow a student to take the test at a different time than the date scheduled.

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 lab instructor will determine your lab grade. Lab reports will be graded but the instructor who will also assess a student's performance in performing the experiment. Pre-lab or post-lab quizzes are optional for the instructor.

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 that occurred too late to be the subject of test questions. Your obligations to this course include attendance at the final exam at the time and date set by the Registrar's Office. You should not make travel arrangements until the final exam is completed.

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. 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 the following laboratory class. It is strongly encouraged to do as much work in the lab as possible. **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.** Lab quizzes are at the discretion of the laboratory instructor.

ACADEMIC STANDARDS AND CLASSROOM PROTOCOL

I will follow the guidelines on *Community Standards for Academic Conduct, Classroom Protocol, and Honor Philosophy* 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 that 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 of 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.

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.