PHYS 204 General Physics II **Spring 2008** (effective 1/15/2008)

Instructor:	Hugh Gallagher
Office:	Physical Science Building 130
Phone, Email:	436-3177, gallagha@oneonta.edu
Office Hours:	M 2:00-3:00 PM, Th 10:00-11:00 AM; W 5:30-7:30 PM; or by appointment
Web Page:	http://employees.oneonta.edu/gallagha/

Class Time and Location:	M, W, F 11:00 to 11:50 AM in HECO 132
Lab Time:	Section 01, T 10:00 AM to 12:50 PM
	Section 02, T 2:00 PM to 4:50 PM
Lab Location:	Physical Science Building 105 (or 109 as announced in class)
Final Exam:	Monday, May 12, 2007, 2:00 to 4:50 PM

Required Text: **Principles of Physics, A Calculus-Based Text, 4th edition**

By Raymond A. Serway and John W. Jewett, Jr.

I recognize that textbooks are expensive. They are also one of the most important tools for maximizing your educational investment. The above text is available in the bookstore will be used for both PHYS 203 and 204.

Science Discovery Center: http://www.oneonta.edu/organizations/sdc/

The Science Discovery Center of Oneonta is located in the basement of the Physical Science Building on the SUNY Oneonta Campus. This highly regarded interactive science *museum* provides you a unique opportunity to observe, feel and experience many of the principles and concepts that we will be discussing in this course. While we may occasionally use this facility for demonstrations and assignments, I highly recommend that you also visit the Science Discovery Center on your own time. FOR THE AMBITIOUS STUDENT, THERE ARE SIGNIFICANT VOLUNTEER OPPORTUNITIES AS A GUIDE AND DEVELOPER FOR THE SDC (ASK HUGH GALLAGHER FOR DETAILS).

PR^{2}EPS Tutoring Center: http://www.oneonta.edu/academics/pr2eps

As part of a large National Science Foundation (NSF) recruitment and retention grant obtained by faculty from the Chemistry and Biochemistry, Physics and Astronomy, and Science Secondary Education, we have created a walk-in tutoring center. The center will be staffed by faculty and upper level majors from the above department who will be available to help you enhance your work in your chemistry and physics classes. Visit early and often to work with

experts and peers on general questions and difficult concepts. Or, start working in the library and visit us when you run into difficulty. **The center will be open in the Physical Science Building Room 122 on Tuesday and Wednesday evenings from 5:30 to 8:30 PM.**

Course Description:

Continuation of PHYS 203, covering electricity and magnetism, DC and AC circuits, wave motion, and geometric and physical optics (as time allows). Includes laboratory.

Prerequisite: PHYS 203, Math 174 completed or concurrent.

What I Desire of You:

I enjoy teaching General Physics because of the content and the students. In past student evaluations, many students indicated that the material in course is quite challenging and they worked much harder in this course than in other courses. The principles you will learn and skills that you will develop in this course will help you become better scientists, educators and problem solvers. Despite the need to fulfill a requirement, I have found that most students are motivated by a sincere desire to understand and apply physical principles. This is why I enjoy working with you.

This course can be difficult and I will not hide my desire that you work hard on the material. It is reasonable for me to expect you to spend up to 8 hours per week outside of class on the material. As most of you are scientists (science teachers and health professionals are scientists), I would like you to:

- Be motivated by a desire to understand nature
- Be diligent and creative in reading the material, asking questions, answering questions, working and reworking problems, evaluating answers and tracking mistakes leading to answers that do not seem reasonable
- Be conscientious, meticulous and creative in your lab work
- Ask frequent questions directly or indirectly related to the material
- Consider how the concepts we discuss are at work in your fields of study
- Evaluate your own progress and see me quickly about difficulties you are having with the material
- Pace your work so that you are not trying to digest difficult material too quickly (cramming generally doesn't work in preparation for physics exams)
- Realize that all of us struggle with physics. Do not be afraid to make mistakes, they are a valuable part of the learning process

If you have clearly tried and are struggling, I will to the best of my ability and availability try to help.

What I Hope You Receive From This Course:

I strongly believe that your experience in this course will help you become better scientists, educators and problems solvers. Through successful completion of this course you should

- Obtain a fundamental understanding of the principles governing the behavior of nature on macroscopic (and in some cases microscopic) scales. Often these principles are the basis of phenomena studied in other disciplines. They are the underpinnings of the universe.
- Enhance your skill in applying geometry, algebra and calculus to model physical phenomena.
- Develop skills and confidence in quantitative analysis that may be applied to all areas of science.
- Become more versatile in secondary education. This may be very important to schools that are struggling to find teachers in Physics, Mathematics, Chemistry and Earth Science.
- Enhance your ability to communicate difficult concepts verbally and in writing
- Gain confidence in your ability to understand and apply difficult material.

Evaluation:

Homework	15 %
Lab Participation	10 %
Lab Exam	10 %
Exams (3)	45 %
Final Exam	20 %

Your course average will be approximately related to your final grade in the following manner: 100 >A> 93 >A-> 90 >B+> 87 >B> 83 >B-> 80 >C+> 77 >C> 73 >C-> 70 >D+> 67 >D> 63 >D-> 60 >E

Participation: During this course, students should expect to spend up to 8 hours per week outside of class on the material. Your work outside of class will be evident in your homework assignments, laboratories and exams. While work outside of class is extremely important, diligent work in class will help you master the material more efficiently and enhances your work outside of class. Consequently, students are expected to be in attendance, on time and attentive. Students are also expected to participate in class by **asking** and answering questions and providing their own insights related to physical principles and applications that are being discussed. Quantitatively, the participation will directly impact your homework, exam and lab grades.

Homework: Homework, consisting of about 5-8 problems and questions, will be assigned approximately weekly as announced in class. This homework will be collected and checked. Some homework problems (randomly selected) will be evaluated in detail. The homework grade will be based on performance on these problems and the overall completeness of the work.

While students are encouraged to discuss homework, be careful not to become too reliant on seeing someone else's solutions. If you discuss a problem with another student, it is a good idea to write up the solution independently and to try to solve similar problems on your own so that

you are sure that you understand the material. In the case of solutions that are copied exactly from another student, all parties will receive a score of 0 for that problem.

Homework assignments should be written up in the order that they are assigned. If you omit a problem, number it and leave a blank in the appropriate space. *Write on only one side of the page. Assignments torn from a spiral bound notebook may not be accepted.* Be sure to include your name, homework number, homework assignment and due date at the top of each page. For substantial partial credit, be sure that solutions are neat, clear and well organized. **Write the homework problems as if you are explaining the solution to a peer without the use of words.** For each problem:

1. Provide a physical description of what is occurring (including a diagram).
2. State explicitly what is given in the problem and what is to be determined (include a free-body diagram where appropriate).
3. Brainstorm in words, symbols or diagrams about the physical relationships between the various quantities in the problem.
4. Provide a detailed step-by-step solution to the problem (including comments is helpful for exam preparation).
5. Clearly indicate your final answer (including appropriate units). Comment on whether or not your answer is reasonable.

Exams: Three major exams and one cumulative final exam will be given. Exams will be based on lectures, reading assignments, homework assignments and labs. A sheet of pertinent formulas will be provided for use during the exam. You will be given an opportunity to review this sheet ahead of time and suggest that additional information be included. These exams make up 65 % of your grade and thus are the **dominant** factor in determining your grade. It can be argued that the greatest impact diligent work on homework and labs can have on your grade is through the enhancement of your performance on exams.

Labs: We will do approximately 10 experimental activities. Physics Labs are generally designed to demonstrate physical concepts and phenomena. Additionally you should gain some skill in acquiring and analyzing data to confirm or refute a given hypothesis. I will try to provide lab write ups ahead of time via my web page. Since some late changes may be made to the lab, the most recent lab hand-outs will be distributed prior to lab. At the beginning of each lab you will fill out an attendance sheet. There will be a brief lecture and then you will do the lab and complete any of the tasks and questions in the hand-out. Before you leave the lab have your lab instructor check your work. Your lab participation grade will be based on this work and your attendance. There will be a one hour lab exam at the end of the semester that will be based on the material and techniques covered in the lab.

Making Up Missed Work: MISSED OR LATE WORK IS A BURDEN TO THE INSTRUCTOR AND THUS DETRACTS FROM THE ATTENTION GIVEN TO THE REST OF THE CLASS. Late homework and lab reports may receive up to 50% of the total score. After 1 week late, a score of zero will be recorded (unless in the case of documented and authorized absence). If you are struggling with a homework assignment, a *little* extra time may be given provided you notify the instructor. Makeup of an exam or lab experiment will be permitted only for a documented, authorized absence or with the permission of the instructor.