

General Physics II

PHYS 202 – Spring 2012

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Course website: <http://www.asg.sc.edu/phys202/home.html>
Blackboard: blackboard.sc.edu

Course Description

General Physics is a three-credit course that focuses on the core concepts, definitions, terms, equations, and relationships of an introductory college level Physics course. It is primarily intended for first year students. The course prerequisites are Algebra and Trigonometry. Calculus is very useful, but not required.

Learning Outcomes

This course is a demanding and hopefully enriching major university course developing a broad base of technical knowledge and insights, coupled with new methods of thinking.

Students will be able to:

- Demonstrate knowledge and an understanding of the foundational laws of nature and science that underlie Physics, and by virtue of being foundational, are also foundational to Chemistry, Biology, Geology, Engineering, Biology, Medicine, Health Science, and other scientific fields.
- Master the fundamental concepts, their definitions, their experimental and theoretical relationships among one another (equations), domain of applicability, associated constants and units.
- Demonstrate an understanding of estimation, numerical uncertainty, order of magnitude estimation, and problem solving.
- Explain how 'science' operates: the interplay of theory and experiment and the linking of a model, with confirmation of existing data and prediction of new data.
- Apply mathematics as a tool of theoretical modeling, prediction, measurement and thus to see mathematics as a formal language. To understand what it means to attack a problem in successive degrees of approximation.
- Formulate thoughts analytically and synthetically: what to question and how and how to identify what should be generally accepted and thus questioned less often. To build an ability and an associated confidence in reasoning in new domains.
- Recognize a sense of history, and the role of science and technology in the historical evolution of man and civilization.

- Recognize how the human view of nature comprises a limited domain: mass, length, time, velocity, acceleration, frequency, size/scale, information, measurement, and disorder. Especially how our senses translate stimulus and register its logarithm as the human sensation.
- Evaluate this underlying theoretical structure along with its successes and current limitations in a holistic manner.

Required Readings

- Course Notes (posted on the website as a supplement to a textbook)

Associated Textbooks (you need to have one recent good text for reference – any edition)

- David Halliday, Robert Resnick, Jearl Walker: *Fundamentals of Physics*, John Wiley & Sons, Inc.
- Raymond A. Serway: *Physics for Scientists and Engineers*, Sanders College Publishing
- Edwin Jones and Richard Childers: *Contemporary College Physics*, McGraw-Hill
- Nicholas J. Giordano: *College Physics: Reasoning and Relationships*, Brookes/Cole Cengage Learning Center

Other Materials

Video Lectures on website: <http://www.asg.sc.edu/phys202/lecturevideos.html>

UNITS software: <https://www.asg.sc.edu:8443/units>

QRECT software: <http://www.asg.sc.edu/projects/qrect.html>

Wikipedia and Web materials

Recommendations on How to Learn the Most with the Least Effort

1. Preview material prior to each class: We will follow the text and the syllabus and specifically the typed lecture notes available on the Web – Print this and bring it to class each time. Prior to each class, preview the material for the next class even if just for 10 minutes. That way, you know what is in the text, my typed notes, videos, and what things are important about those concepts. One will get an overview of the material to be covered and this makes it far easier to rapidly assimilate the lecture and to take notes that complement (and do not reproduce) the other material.

2. Attend all classes for the entire period: I am not impressed with the taking of voluminous notes, but rather the student who listens, absorbs, and assimilates the lecture. Your notes should indicate where the concentration areas, important concepts, things to be ignored, and what will be on the tests. Really listen with full attention.

3. After class but that same day, create a nice set of notes: With your class notes in front of you, your text open to the class material, with your memory of your pre-class reading of the text, the class notes on the web site, and the knowledge learned in class, then make a set of clear neat

notes that condenses the class lecture, videos, and the text. Use the class web site to keep up to date and print out older pertinent exams etc.

4. Review these condensed notes prior to each exam: Use the condensed notes to review for the exam along with the text. Practice taking the older tests where pertinent. It is always best to study with other students and share information and to explain concepts to others. It is a fact that if you explain something and teach someone else, you will learn more in the process than they do, so never hesitate to help others. In the process of teaching, you will formulate the concepts and relationships more clearly.

5. After each of the four tests, classify your errors into types such as (a) arithmetic or algebraic mistake in calculation, (b) forgot formula, (c) could not convert the word explanation or setting into a mathematical setting, (d) carelessness (e.g. marking the wrong question or alternative).

6. Never miss class if possible – attendance is required. Never cut a test if possible all tests are required.

Course Communications

Discussion Board forums will be created for each chapter. If you have questions or comments about information covered in a chapter, please enter your question within the forum for that particular chapter. Anyone can respond to questions/comments posed by others.

If you have questions pertaining to this course, first post your questions on the Frequently Asked Questions (FAQ) Discussion Board forum in Blackboard. Anyone may answer your questions.

If you have personal questions pertaining to this course, please email Dr. Johnson at jjohnson@sc.edu

All communication on the Discussion Boards and via emails should be professional. Concise and relevant subject lines should be used and spelling/grammar should be carefully checked. Write in a professional tone. Text message language is not accepted.

When sending an email, please include a detailed subject line. Additionally, make sure you reference the course – PHYS 202 - in the message and sign the email with your name.

Disability Services

Students with disabilities are encouraged to contact the Office of Student Disability Services. The contact information is below:

1523 Greene Street
LeConte Room 112A
Columbia, SC 29208
Phone: 803-777-6142
Fax: 803-777-6741

Email: sasds@mailbox.sc.edu
Web: <http://www.sa.sc.edu/sds/>

Additionally, students with disabilities should discuss accommodations with Dr. Johnson before or during the first week of class.

Late Work/Make-Up Policy

Late work will not be accepted after the due date. Exceptions will only be made in extenuating circumstances and at the discretion of the instructor.

The examinations must be taken as scheduled on this syllabus. Exceptions will only be made in extenuating circumstances and at the discretion of the instructor.

Overall Structure of the Course

The course is designed to provide students with a variety of contexts for understanding and evaluating research methods and processes. Students will be expected to apply all terms and concepts presented in the course to research problems and studies. The typical class structure will consist of weekly modules, which include:

- Course Notes
- Video Lectures
- Homework on QRECT

Course Requirements

Students are required to watch all video lectures, read all course notes, and complete homework on time.

Assignments

Homework will be assigned for each chapter. The homework for each chapter must be completed before the test.

Examinations

Perform on 4 exams of one hour plus a cumulative 2 hour final exam. Attendance is required and class participation via the QRECT classroom software system is mandatory. The final exam counts as two exams and can be used in place of one of the other exams.

Submitting Homework

- Homework problems and exams will be submitted through the QRECT software.
- Homework is due by the time of the test for those chapters.

Plagiarism

Plagiarism is any form is unacceptable. Plagiarism is defined as the use of another person's words or ideas without giving proper credit.

Plagiarism includes copying and pasting information from the Internet. All written assignments may be checked with a plagiarism software tool that accesses the entire Internet and a database of students' papers. Furthermore, the instructor carefully reads each assignment and can recognize work that is not of that student.

Plagiarism will result in a failing grade for the course and may result in disciplinary action from the university. Students who are suspected of plagiarism will be turned in to the Academic Integrity Office for discipline. Students are responsible for understanding the university policy on plagiarism and regulations provided by the Academic Integrity Office.

University Policies on Academic Responsibility and Guidelines

Students in this course should be familiar with the university policies on Academic Responsibility and guidelines. Below are some websites for you to visit to learn more about the University policies.

- Carolina Creed: <http://www.sa.sc.edu/creed>
- Academic Responsibility: <http://www.sc.edu/policies/staf625.pdf>
- Honor Code Violations: <http://www.housing.sc.edu/academicintegrity/violations.html>
- Guidelines for Responsible Computing: <http://www.uts.sc.edu/network/guidelines.shtml>

Assessments and Grading

Students will be evaluated on homework assignments, four examinations, and a final. The assignments will be graded on a scale from 0 to 100, reflecting percent of possible points earned.

Grades will be assigned as follows:

>59.5 = D; >69.5 = C; >79.5 = B; >89.5 = A with optional C+ at >76.5 and B+ at > 86.5

Four Exams of 100 pts each plus a Final Exam of 200 pts for a total score to be divided by 600.

Consideration is given for involvement on the discussion board, class response, and homework.

Course Outline

Dates	Topic(s)	Chapter(s)	Activities/Assignments
Week 1: January 9 th – January 15 th	<ul style="list-style-type: none">• Electric Forces• Electric Field	20 21	<ul style="list-style-type: none">• Watch Introductory Videos• Complete Introductory Discussion Board Post

			<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Homework Problems
Week 2: January 16 th – January 22 nd	<ul style="list-style-type: none"> • Gauss' Law • Electric Potential & Potential Energy 	22 23	<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Practice Problems
Week 3: January 23 rd – January 29 th	<ul style="list-style-type: none"> • Capacitance • Electric Current & Resistance 	24 25	<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Practice Problems
Week 4: January 30 th – February 5 th	<ul style="list-style-type: none"> • Direct Electrical Currents 	Review Exam 1 26	<ul style="list-style-type: none"> • Review • Exam 1 (Thursday, February 2nd) • Read Course Notes • Watch Lecture Videos • Work Practice Problems
Week 5: February 6 th – February 12 th	<ul style="list-style-type: none"> • Magnetic Fields • Magnetic Field Sources 	27 28	<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Practice Problems
Week 6: February 13 th – February 19 th	<ul style="list-style-type: none"> • Faraday's Law • Induction 	29 30	<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Practice Problems
Week 7: February 20 th – February 26 th	<ul style="list-style-type: none"> • Alternating Electric Currents • Maxwell's Equations 	31 32 Review Exam 2	<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Practice Problems • Review • Exam 2 (Thursday, February 23rd)
Week 8: February 27 th – March 4 th	<ul style="list-style-type: none"> • Solution in a Vacuum – EM Waves 	33 34	<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Practice Problems

	<ul style="list-style-type: none"> • Reflection of Light & Mirrors 		
Week 9: March 5th – March 11th - Spring Break: No Classes			
Week 10: March 12 th – March 18 th	<ul style="list-style-type: none"> • Refraction of Light & Lenses • Interference & Wave Nature of Light 	35 36	<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Practice Problems
Week 11: March 19 th – March 25 th	<ul style="list-style-type: none"> • Special Relativity 1905 • General Relativity & Astrophysics 1916 	37 38	<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Practice Problems
Week 12: March 26 th – April 1 st		Review Exam 3	<ul style="list-style-type: none"> • Review • Exam 3 (Thursday, March 29th)
Week 13: April 2 nd – April 8 th	<ul style="list-style-type: none"> • Foundations of Quantum Mechanics – Particles & Waves • Atomic Theory 	39 40	<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Practice Problems
Week 14: April 9 th – April 16 th	<ul style="list-style-type: none"> • Nuclear Theory & Radioactivity • Elementary Particle Theory 	41 42	<ul style="list-style-type: none"> • Read Course Notes • Watch Lecture Videos • Work Practice Problems
Week 15: April 17 th – April 23 rd	<ul style="list-style-type: none"> • Cosmology 	Review Exam 4 43	<ul style="list-style-type: none"> • Review • Exam 4 (Thursday, April 19th) • Read Course Notes • Watch Lecture Videos • Work Homework Problems
Tuesday, May 1, 2012 – 2:00PM - Final Exam			