

Northern Virginia Community College
Alexandria Campus
PHY 202 General College Physics II

Instructor: Dr. David D. Blackwell
Lecture: Monday 6:00 p.m.-8:50 p.m.
Lab: Wednesday 6:00 p.m.-8:50 p.m.

Office hours MW 5:30-6:00 p.m.
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Textbook Physics: Principles With Applications, Giancoli, 6th or 7th edition, electronic copy is okay

Course Description: PHY 202 is the second semester of the Physics 201-202 series. This course covers basic electromagnetics, fundamental electric circuit analysis, basic optics, and introductory atomic structure. It is expected that you have taken PHY 201 or equivalent and thus are already familiar with Newtonian mechanics and conservation laws (momentum and energy), along with the necessary experience in solving vector problems. As in PHY 201, my emphasis is on developing problem solving methods; it is hoped that such skills will not only be valuable in this class but in academics in general.

Prerequisites: The physics 200 series requires a reasonable degree of competency in algebra and trigonometry. If these subject areas are difficult for you then this course will also be difficult. If you need a mathematics review, consider the drop in math lab in AA-229 which has review problems on computers as well as student tutors. If you have math deficiencies you will need to correct them within the first few weeks of the course.

Requirements: A scientific calculator is required for this course. It should have trigonometric and inverse trigonometric functions, power functions such as square roots and y^x , and scientific notation. It should also be easy enough to use so you don't have to waste time figuring out how to work something while doing a problem. Casio and Texas Instruments each make several models that cost less than \$20. Some laboratory experiments require safety goggles (chemical and impact resistant) which you will have to provide. All labs also require closed toed shoes (no sandals or flip flops). You are responsible for withdrawing yourself from the course. The last day to withdraw without academic penalty is Tuesday 11/3/15. The last day to drop with tuition refund or change to audit is Thursday 9/10/15. Those seeking accommodations based on disabilities should provide a Disability Data Sheet obtained through the Counselor for Special Needs, located in the Bisdorf Building, Room 148 (tel. 703-845-6301)

Exams: There are three exams covering the course material as outlined in the schedule. There is also a comprehensive final exam; the final exam counts as two regular exams. The total exam grade is the average of the final (weighted twice) and the two highest regular exams.

Makeup exams- If missing an exam/quiz is unavoidable, you are required to make arrangements with the instructor before the exam. Makeup exams are given in the testing center at an agreed upon time as soon as possible after the in class exam. You are only allowed one makeup exam throughout the semester.

Homework: Every CH covered requires answers to multiple choice questions and problems made available in the assignments section on the Blackboard. Once the due date for the assignment has passed, the assignment will no longer be available and cannot be taken. You are allowed to submit the assignment for grading twice, with the highest score kept. The answers are given after the due date for the assignment.

Academic Misconduct: Any proof of cheating on an exam will result in an F for that exam for the first instance, and an F in the course for second offense. It is not considered cheating to form study groups to work out homework problems.

Grading: Exams total: 60%; Online Assignments: 25%; Laboratory: 15%

Composite grade	Letter grade
90-100	A
80-89	B
70-79	C
60-69	D
<60	F

SCHEDULE

date	topics	study examples	assignment	due date
Mon, Jan 9	Charge and the Electric Field	16-1,16-2, 4,16-7,16-8,16-9,16-12,16-13	CH 16 online problems	Jan 25
Wed, Jan 11	lab 1 :electric field mapping			
Mon, Jan 16	non-instructional day			
Wed, Jan 18	Electric Field Problems & Electric Potential :			
Mon, Jan 23	Electric Potential and Capacitance	17-2,17-3,17-4,17-5,17-6,17-8,17-10,17-11,17-12	CH 17 online problems	Feb 1
Wed, Jan 25	lab 2 : RC Circuits			
Mon, Jan 30	Ohm's Law, Currents, Resistivity	18-1,18-3,18-5,18-6,18-7,18-8,18-9,18-10,18-11,18-13	CH 18 online problems	Feb 8
Wed, Feb 1	lab 3 : Ohms law			
Mon, Feb 6	DC circuits; Kirchoff's Laws	19-1,19-3,19-4,19-7,19-8,19-9,19-10,19-11,19-12	CH 19 online problems	Feb 14
Wed, Feb 8	Review			
Mon, Feb 13	Exam 1			
Wed, Feb 15	lab 5: Earth's Magnetic field (alternative)			
Mon, Feb 20	Magnetism I	20-1,20-2,20-4,20-9,20-10,20-12,20-13	CH 20 online problems	Feb 29

Wed, Feb 22	lab 6: Lorentz force			
Mon, Feb 27	Magnetism II	21-1,21-4,21-5,21-7,21-10,21-11,21-14,21-15	CH 21 online problems	Mar 14
Wed, Mar 1	lab 7: AC circuits			
Mon, Mar 6	non-instructional day			
Wed, Mar 8	non-instructional day			
Mon, Mar 13	Electromagnetic Waves	22-1,22-2,22-3,22-4	CH 22 online problems	Mar 21
Wed, Mar 15	Review			
Mon, Mar 20	Exam 2			
Wed, Mar 22	Lab 8: Optics 1			
Mon, Mar 27	Mirrors, Refraction & Lenses	23-1,23-2,23-4,23-6,23-7,23-8,23-9,23-12,23-13,23-14	CH 23 online problems	Apr 4
Wed, Mar 29	Lab 9: Optics II			
Mon, Apr 3	Refraction, Diffraction & Interference	24-1,24-3,24-5,24-7,24-8,24-10,24-10,24-11,24-12	CH 24 online problems	Apr 11
Wed, Apr 5	lab 10: Interference			
Mon, Apr 10	Review			
Wed, Apr 12	Exam 3			
Mon, Apr 17	Quantum Physics	27-2,27-3,27-4,27-5,27-6,27-7,27-10,27-11,27-12,27-13,27-14,27-15,27-16	CH 27 online problems	Apr 25
Wed, Apr 19	lab 11: analysis of light			
Mon, Apr 24	Quantum/Atomic Physics; Radioactivity	28-1,28-2,28-3,28-5,28-6,30-4,30-5,30-6,30-8,30-9,30-11,30-13	CH 28 & 30 online problems	May 6
Wed, Apr 26	Review			
Mon, May 1	Final Exam			

Tips for doing well in this class

- Be active and learn by doing rather than reading. Work through the derivations of formulas, write out and work through textbook examples including algebraic steps. If all you can do is read then read out loud, repeatedly if you have to. Put what you just read into your own words. Anything that is important enough to remember should be written down; not highlighted, written down. Making your own outline on the CH is better still.
- Ask questions when you don't understand, or didn't hear, anything said during class. If you get stuck on a homework assignment, ask a classmate, or better yet, the professor. If you are struggling with some part of the material, tell the professor. Stay after class and ask about it.
- Work out tough problems. Look for a couple of problems in the book CH that look intimidating or complicated and try to do them. If you get a tough problem that you can't do, try a simpler version of the problem first, then work your way towards the more difficult one by adding components (this also works at the professional level in science). When you are finished, or get stuck, ask the professor for help. You improve skills not just through repetition, but by increasing the difficulty level of the tasks.

Steps for solving physics problems

1. Read the problem carefully and identify what is given and what is being asked for.
2. Draw a picture if you need help picturing what's going on, or, describe in your own words (meaning write down) what is going on.
3. Formulate a plan. What physical laws apply here? Usually Newton's Laws and Conservation of Energy apply to most problems. What other conservation laws apply? What formulas need to be used to carry out the plan?
4. Write out algebraic expressions for the solution or solutions. Start simple and increase in complexity as needed.
5. Check the units of your expressions. If the units are right, you're probably doing the problem right, but if the units are wrong, you're definitely doing the problem wrong. In the latter case you need to go back and look for a mistake.
6. Plug in numbers to the expressions and calculate the answer.
7. Does the answer pass the "common sense test"? Super luminal speeds, ridiculously large or small masses, temperatures below absolute zero, are all examples of red flags that should tell you something is wrong.