

Northern Virginia Community College  
Alexandria Campus  
PHY 201 General College Physics I

**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.  
dblackwell@nvcc.edu  
<http://www.nvcc.edu/home/dblackwell/>

**Textbook Physics: Principles With Applications, Giancoli, 6th or 7th edition, electronic copy is okay**

**Course Description:** Physics 201 is the first semester of the Physics 201-202 series. The course is a non-calculus treatment of physics and it is intended for students in some of the two-year technical programs offered at NVCC and also for pre-med, pre-vet, pre-dental, Liberal Arts and pre-teaching non-science majors, thus satisfying the requirement for a laboratory science at many four-year institutions. Covered are principles of mechanics such as kinematics, forces, conservation of energy, momentum, collisions, oscillatory and rotational motion, and fluids. As time allows we will also cover temperature and the universal gas law, heat transfer with phase transitions, and introductory thermodynamics.

**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 11/1/16. The last day to drop with tuition refund or change to audit is Thursday 9/8/16. 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 and Quizzes:** 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. There are also nine quizzes which are normally given every Monday at the beginning of class as the schedule allows.

**Makeup exams-** If missing an exam 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 during the semester. Makeup quizzes will be made available online and are more difficult than the in-class quiz.

**Homework:** All circled problems in the syllabus are to be handed in at the end of class on the due date, placed in my mailbox in room AA 352, or scanned and emailed to me. Homework assignments are due on the due date listed; if you didn't have time to work out all the problems, hand in the ones you could do and at least get partial credit. Late homeworks are not accepted after the homework answers have been posted. In addition to being 10% of the final grade, all quiz problems are taken from these sets of problems, including non-circled problems, so it pays to do as many as you can.

**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%; Quizzes: 20%; Homework: 10% Laboratory: 10%

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

## Schedule

date	material covered	assignment	assignment due date
Mon, Aug 22	1.5-1.6: Units and Measurement; 2.1-2.7: Motion in one dimension; Quiz: Unit Conversion	Ch 1: 12, (17), (18), (20), 24, 32 ch 2: 3, 8, 13, (16), 19, 26, 29, (31), (46), (52)	08/31/16
Wed, Aug 24	Lab: velocity and acceleration		
Mon, Aug 29	3.1-3.4: Vectors; 3.5-3.6 Motion in two dimensions; Quiz: Motion in one dimension	ch 3: 6, (8), 12, 15, (20), 24, (27), 31, 34, (37)	09/07/16
Wed, Aug 31	Lab: Addition of forces		
Mon, Sep 5	<b>no class</b>		
Wed, Sep 7	Lab: Newton's 2nd Law		
Mon, Sep 12	4.1-4.6 Newton's Laws; 4.7-4.8 Force problems; Quiz: Motion in 2-D	ch 4: 11, (13), 23, 28, 26, (32), 40, (59), (66), (67)	09/21/16
Wed, Sep 14	review/recitation		
Mon, Sep 19	<b>Exam 1</b>		
Wed, Sep 21	Lab: Circular Motion		
Mon, Sep 26	5.1-5.2 Centripetal Force; 5.3, 5.6-5.8: Circular Motion and Gravitation	ch 5: 10, 15, (22), 31, 33, (52), 54, 62, (68), (71)	09/28/16
Wed, Sep 28	Lab: Conservation of energy		
Mon, Oct 3	6.1-6.10: work and energy; Quiz: centripetal force	ch 6: 5, 8, (13), 21, (22), 30, 39, (41), (44), 63	10/12/16
Wed, Oct 5	Lab: Linear Momentum		
Mon, Oct 10	<b>no class</b>		

## Schedule (continued)

date	material covered	assignment	assignment due date
Wed, Oct 12	7.1-7.8: Linear Momentum; 8.1-8.8: Rotational Motion; Quiz: conservation of energy	ch 7: 5, 6, 7, 16, 18, (28), (37), 52, 69, (71); ch 8: 10, 14, 20, 28, (34), (47), 52, (58), 64, (72)	10/26/16
Mon, Oct 17	9.1-9.2: Static Equilibrium; Quiz: conservation of momentum	ch 9: 1, 5, 6, (13), (18)	10/26/16
Wed, Oct 19	review/recitation		
Mon, Oct 24	<b>Exam 2</b>		
Wed, Oct 26	recitation/tbd		
Mon, Oct 31	11.1-11.9, 11.11-11.13: Oscillatory Motion and Waves; 12.1-12.7: Sound	ch 11: 5, 7, (11), 30, (32), (38), 42, 48, (54), 55; ch 12: 5, (7), 13, (21), (31), 35, 50, (57), 64, 96	11/09/16
Wed, Nov 2	Lab: Simple Harmonic Oscillator		
Mon, Nov 7	10.1-10.7: Fluids; Quiz: oscillatory motion	Ch 10: (5), 13, 15, (18), 25, (27), (32), (48), 49, 66;	
Wed, Nov 9	Lab: Gas Laws		
Mon, Nov 14	13.1-13.10: Gas Laws; Temperature Expansion; Quiz: Buoyancy	ch 13: 8, (13), 15, 18, (20), (25), (50), 54, (72), 84	11/28/16
Wed, Nov 16	Lab: Specific Heat		
Mon, Nov 21	14.1-14.5: Heat and Temperature; Quiz: Gas Laws	ch 14: 5, 8, 6, (13), (14), (18), (22), (27), (34), 42, 44;	11/30/16
Wed, Nov 23	<b>no class</b>		
Mon, Nov 28	review/recitation		
Wed, Nov 30	<b>Exam 3</b>		
Mon, Dec 5	review/recitation		
Wed, Dec 7	review/recitation		
Mon, Dec 12	<b>Final Exam (comprehensive)</b>		

### 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 chapter 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 chapter 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** *“There are two things you need to be able to do in order to be a scientist. One is knowing where to look up an answer. Two is knowing when you've made a mistake.”* –Prof. Abe Korn, 1985.

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.