

University Physics I

(Physics 231, CRN 10171)

Welcome to University Physics I at Old Dominion University. This course is intended to give a solid introduction to basic principles of classical mechanics, waves and thermodynamics, to develop problem solving skills, and to prepare university students for professional careers in science and engineering. The emphasis will be to study what is important today and in the future rather than to cover all topics in the traditional syllabus. In this course we shall cover fewer topics, but in greater depth. The course is calculus based. The laboratory is an important part of this course.

Co requisite	Math 211 or permission of instructor. <i>Math proficiency in the following areas is essential: algebra, trigonometry, vectors and introductory calculus. If you are uncertain about your preparation, consult the instructor.</i>
Instructor	Dr. Alexander L. Godunov Office: OCNPS 0219 (Oceanography and Physics) Phone: 683-5805 godunov@physics.odu.edu Web page: http://www.physics.odu.edu/~godunov/teaching/phys231_07
Classes	MWF, 14:00 – 14:50, in Oceanography & Physics, Room 200
Materials	University Physics by Young & Freedman, 10 th , 11 th , 12 th editions (recommended) Physics 111/226/231 Laboratory Manual (required) Mastering Physics Student Packet (required) (www.masteringphysics.com).
Support resources	<i>Office hours:</i> Monday 13:00 – 13.50 & Wednesday 15:00 – 16:00 in OCNPS 0219, Wednesday 16:00 – 17:00 in Physics Learning Center OCNPS 0142, and by appointment <i>Physics learning center:</i> a place where students in all physics courses can get help. The center is staffed by physics faculty and TAs (room OCNPS 0142), see http://www.sci.odu.edu/physics/resources/learning_center.shtml <i>E-mail:</i> The e-mail address is godunov@physics.odu.edu (have “physics 231” in the subject line). <i>Phone:</i> Feel free to contact the instructor for any urgent questions.
Time commitment	Physics 231 is a demanding course and students should allocate sufficient time during the semester to do well in the course (between 12 and 15 hours per week: lectures 3 hrs/week, studying 3-5 hrs/week, homework 3-4 hrs/week, labs about 3 hrs/week) . If you are spending more than 15 hours per week, you should contact the instructor to develop a different studying strategy.
Course Grades	The final grade is calculated on an absolute scale. There are 100 points possible for this course of which 15 points are for the homework, 15 points for the laboratories and 70 points for the examinations. The lowest midterm examination score is not counted; the remaining two count for 15 points each. The final exam

counts for 40 points. The grading policy is non-competitive and lenient, but there will be no curve.

A letter grade is determined only at the end of the term.

Class time

Each class period will consist of lectures, interactive discussions and may include conceptual quizzes*.

(*) short multiple-choice questions that focus on the underlying concepts.

Homework

The homework is to be submitted via the web using 'Mastering Physics'. The class name is GodunovPhys231. After the first login you need to enter your UIN, and your Last and First name.

Homework will be set as we progress through the course. One assignment will be due approximately each week, (about 14 assignments). Assignments are due before 21:00 at the Mastering Physics web site on the indicated date.

No individual extension of assignment submission dates will be given.

Doing the homework problems is one of the best ways to learn the material. Credit for homework is given to encourage practicing and thinking about physics on a regular basis. This credit will influence the final grade for this course.

Laboratory

The departmental policy is that ***a student must pass the lab to pass the course.***

The labs are self-contained. Some will not be 'in sequence' with the lecture.

The following rules will apply:

- You must read the assigned experiment before coming to lab class. There may be a short quiz before labs to insure the student is properly prepared for it.
- ***Attendance is mandatory.*** You will be allowed one (1) unexcused "cut" during this semester. A grade F will be assigned to a student who has two (2) or more unexcused "cuts". There will be no make up labs.
- Laboratory reports should be prepared according to the instructions in the Physics 231 Laboratory Manual. In addition, your laboratory instructor will discuss the format for your laboratory report and their grading procedure.

Exams

There will be three midterm exams and one final exam. The midterm examinations will be given during the regularly scheduled class periods. All the exams will be closed book, but one page (8½" × 11") with basic equations will be allowed, (i.e. no homework solutions are allowed on the formula sheet). You must turn in your formula sheet at the end of the test.

The examinations will emphasize the material in lectures and homework assignments. Some material covered in class may be omitted. A typical exam will include problems and questions similar to the homework or discussions in class. Your work should be neat and orderly; with large, clear, and clearly labeled diagrams. Formulas and numbers alone won't do; you must show your work and explain your reasoning to earn full credit on a problem.

All exams are hand-graded. Most credit is given for the correct method or "Theory". It is the responsibility of the student to communicate answers clearly. The final examination is comprehensive. It is mandatory and will be given only at the scheduled time.

Regrade: Requests for correction of grading mistakes on exams can be made when the work is returned to you. The requests must be made within four days after getting your grade. Regrade requests should be written. In their request, students must explain why they believe there is a mistake in grading and why they deserve more credit. It is not a plea for more points. However, clerical errors (e.g., addition errors) will be corrected immediately.

No make-up examinations will be given. In case you have a legitimate reason for missing an exam, consult with me before, or within 24 hours after the exam. If you miss more than one a midterm examination for an officially excused reason (documented illness or family emergency, major religious holidays, or official university business) your missed examination score will be replaced with the appropriately scaled score on the portion of the final exam that covers same material as the missed midterm examination.

Midterm exams	September 24 th , 2007 14:00 – 14:50 Oceanography & Physics, Room 200 October 22 nd , 2007 14:00 – 14:50 Oceanography & Physics, Room 200 November 19 th , 2007 14:00 – 14:50 Oceanography & Physics, Room 200
Final Exam	December 10 th , 2007, 12:30 – 15:30 Oceanography & Physics, Room 200
Course goals	Teach understanding of the basic principles of classical mechanics and waves, teach the qualitative and quantitative thinking skills that can be applied in a broad variety of fields and circumstances. Cultivate individual and collaborative problem solving skills.
Course structure	Different people learn in different ways. Therefore this course offers a learning environment with a diversified set of options that you can tailor to your individual learning style. There are class meetings, review sessions, homework assignments, laboratory sessions, office hours, and many ways to get additional support.
Keys to success	What counts in Physics 231 is to understand the underlying concepts. Advanced reading, consistent participation, and timely completion of assignments are the keys to success. If you work regularly and allocate enough time each day to complete the assignments on time and keep up with the course, you will get the most out of the course both intellectually and grade-wise. Two things that generally do not work are memorization (on exams you may have a page with equations anyway) and cramming to catch up just before the examinations (it will be impossible to assimilate all the material). Use the support resources to clarify the material as soon as you feel unsure about something — the instructor is there to help you.
Expectations	For the most efficient use of time in class – you are expected to be prepared for class by reading the material ahead. Reading ahead requires time and some discipline, but the payoff is considerable: the material will be much easier to understand. Exams and assignments – you are expected to do your work in a neat way (clear

diagrams, equations, explanations and numbers). You must show your work and explain your reasoning to earn full credit on a problem.

Finally, you are expected to ask for help when you feel you do not understand something. Do not wait until the final exam to address any problems with the material, most of the time it will be too late.

Important

In Physics 231, high professional and ethical standards are promoted. Plagiarism and cheating are serious offenses and may be punished by failure on the exam and failure in the course. The academic integrity code is to be maintained at all times.

Collaboration

Collaboration in class, during laboratories, and on homework assignments is strongly encouraged. Because the course is graded on an absolute scale, you will never reduce your grade by helping others — on the contrary, by doing so you will reinforce your own knowledge and improve your performance. Although, before working together or consulting others on any assignments, it is helpful to first tackle the work alone.

Activities for which collaboration is not permitted are: examinations and submission of homework assignments.

Course Syllabus

Chapter	Sections
1. Units, Physical Quantities, and Vectors	1.1 – 1.10
2. Motion Along a Straight Line	2.1 – 2.5, 2.6*
3. Motion in Two or Three Dimensions	3.1 – 3.4, 3.5*
4. Newton's Laws of Motion	4.1 – 4.6
5. Applying Newton's Laws	5.1 – 5.5
6. Work and Kinetic Energy	6.1 – 6.4
7. Potential Energy and Energy Conservation	7.1 – 7.5
8. Momentum, Impulse, and Collisions	8.1 – 8.5, 8.6*
9. Rotation of Rigid Bodies	9.1 – 9.5, 9.6*
10. Dynamics of Rotational Motion	10.1 – 10.6, 10.7*
11. Equilibrium and Elasticity	11.1 – 11.3, 11.4*
12. Gravitation	12.1 – 12.4, 12.5*, 12.6*, 12.7 – 12.8
13. Periodic Motion	13.1 – 13.8
14. Fluid Mechanics	14.1 – 14.6
15. Mechanical Waves	15.1 – 15.6, 15.7*, 15.8*
16. Sound and Hearing	16.1 – 16.4, 16.5* – 16.7*, 16.8, 16.9*
17. Temperature and Heat	17.1 – 17.7
18. Thermal Properties of Matter	18.1* – 18.4*
19. The First Law of Thermodynamics	19.1* – 19.8*
20. The Second Law of Thermodynamics	20.1* – 20.8*

* Indicates "optional" sections (if we get that far)

Some topics may be added and some topics omitted at the instructor's discretion, and depending on student's interest and time constraints.