Physics 101N         Summer 2018
Conceptual Physics I

Dr. L. Vušković

COURSE INFORMATION

Course Physics 101N (4 credits) CRN 30666 + Lab CRN 30677
You must be separately registered for both the Lecture and Lab CRNs.

Lectures TWRF 1:00–4:30 Oceanography and Physics (OCNPS) Room 200

Course Info https://www.blackboard.odu.edu

MasteringPhysics Access Code (bundled with textbook at ODU bookstore)

Optional Problem Solving in Conceptual Physics, Heweitt and Wolf
The Cartoon Guide to Physics, Gonick and Huffman
Guesstimation, Weinstein and Adam
Fear of Physics, L. Krauss
How Things Work, L. Bloomfield

Lecturer Dr. L. Vušković, Professor of Physics
Office: Room 2100-I, PSB
Office Telephone: 683-4611
Email: Vuskovic@odu.edu
Office Hours: • TWRF 11:00–12:30 in PSB 2100-I
• By appointment

Exams Two in-class exams and a 3-hour comprehensive final exam will be given.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
<th>Time</th>
<th>Place</th>
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<tbody>
<tr>
<td>Exam I</td>
<td>May 11</td>
<td>3:00-4:00</td>
<td>OCNPS 100</td>
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<tr>
<td>Exam II</td>
<td>May 18</td>
<td>3:00-4:00</td>
<td>OCNPS 100</td>
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<tr>
<td>Final Exam</td>
<td>May 25</td>
<td>1:00-4:00</td>
<td>OCNPS 100</td>
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All Exams are closed book, closed notes. Bring a calculator and the ExamFormulaSheet or one page hand-written formulas. No additions or annotations allowed. Make up exams will be given only under extreme circumstances. If you have to miss a test, contact me as soon as possible (preferably in advance). For emergencies, I will average your other exam scores.

The accommodation: Students are encouraged to self-disclose disabilities that have been verified by the Office of Educational Accessibility by providing Accommodation Letters to their instructors early in the semester in order to start receiving accommodations. Accommodations will not be made until the Accommodation Letters are provided to instructors each semester.
Grading

A letter grade is determined **only** at the end of the term. This course is uncurved. Everyone can get an A.

- 10% Homework (online with MasteringPhysics)
- 40% Two Midterm Exams (20% each)
- 35% Final Exam
- 15% Laboratory (**Note**: You must pass the lab to pass the course.)

**Expected grade requirements:**
A: 100-88%; B: 88-72%; C: 72-55%; D: 55-50%.

Plusses and minuses will be awarded.

Homework

You need to practice to learn anything, from painting to basketball to physics. Doing the homework problems yourself helps you learn the material and incidentally helps your grade!

MasteringPhysics course ID: **VUSKOVICSUMMER2018**

Homework must be turned in on the internet via [http://www.masteringphysics.com/](http://www.masteringphysics.com/). Use the course ID above. Your subscription to MasteringPhysics comes as a bundle with the textbook if you purchase the book at the ODU Bookstore. The bundle may be available from other sources, but if not, you must purchase the subscription separately from MasteringPhysics. Numerical and multiple-choice answers will be graded immediately by MasteringPhysics. Exercises with written answers will be graded later.

Work out the problem on paper first, before putting answers into MasteringPhysics. Check your results to see if the magnitude makes sense. Check your units – no answer is complete without the proper units (e.g. meters, meter/sec, Watt, etc). Carry your units in your paper calculations. The consistency of your units is a powerful check on your algebra. You cannot add meters to seconds. If you are adding feet and meters, you should first convert to a common unit of measure. Enter all answers with at least 3 significant digits (In intermediate steps, keep at least 4 significant digits). MasteringPhysics will automatically randomize some input values given, so no two students will have the same exact answer.

Homework is not a test. You are encouraged to work together. However, you may not copy another student's final or almost-final answers. All narrative explanations must be in your own unique words. Use of published/online homework solutions is considered cheating.

Attendance

Lecture notes will be posted but are not meant to substitute for attendance. Your attendance will be verified with your signature at the beginning of the lecture.
Physics 101N  
*Conceptual Physics I*

**Laboratory** Students who fail the laboratory will fail the entire course!

**Attendance is mandatory.** You will be allowed one (1) unexcused absence during the semester. If you have two or more unexcused absences, you will fail the entire course. It is your responsibility to inform your lab TA of any absence; there will be very limited opportunities to make up the missed work. Read the assigned experiment before the lab begins and bring the lab manual, calculators, graph paper, etc.

Laboratory reports should be prepared according to the instructions in the Physics 101 Laboratory Manual. Your TA will also discuss the format for your lab reports and the grading procedure.

**University Honor Code**

You are expected to conform to the University Honor Code in all aspects of your conduct in this course. For example, you may work with others on the homework; however, what you submit must represent your own understanding of the problem. Also, I direct your attention to the rules of “CCC” (College Classroom Conduct) published by the Office of Student Judicial Affairs. In particular, I will not condone interruptions of lectures by students receiving cell phone calls, entering or leaving during the allotted classroom time, or engaging in other distracting or disrespectful behavior.

**COURSE SYLLABUS** (subject to change)

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<thead>
<tr>
<th>Date</th>
<th>Chapter</th>
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<tr>
<td>May 8</td>
<td>1 &amp; 2</td>
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<tr>
<td>May 9</td>
<td>3 &amp; 4</td>
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<td>May 10</td>
<td>4 &amp; 5</td>
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<tr>
<td>May 11</td>
<td>Review &amp; Test 1</td>
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<tr>
<td>May 15</td>
<td>6 &amp; 7</td>
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<td>May 16</td>
<td>7 &amp; 8</td>
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<td>May 17</td>
<td>9 &amp; 10</td>
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<td>May 18</td>
<td>Review &amp; Test 2</td>
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<td>May 22</td>
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<td>May 23</td>
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<td>May 24</td>
<td>24 &amp; 25</td>
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<tr>
<td>May 25</td>
<td>Review &amp; Final Exam</td>
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General Considerations

(1) Is this course for me?

The purpose of this course is to gain a fundamental understanding of how Physics can describe the world around us with a coherent body of concepts and models. We will develop some very abstract ideas (energy, momentum, force) that have precise meanings (as opposed to the loose everyday meanings we associate with some of these words). We will also have to "unlearn" some of the "obvious" things we thought we knew about the physical world around us and how it works that just ain't so. Finally, to demonstrate the relationship between the abstract concepts and models and everyday phenomena or technical applications, we will have to study a variety of examples and observations and solve problems. It helps if you have some knowledge of math (high school geometry and algebra) and had some science courses in high school as well. Even more importantly, you should have some curiosity about science and how it can explain the natural world. If you think this applies to you, then this course should reward you with a deeper understanding of the world around you (not to mention a reasonable grade — but no guarantees!). In that case, this course is definitely for you!

Note that you only have a couple of classes to withdraw with full tuition refund (See www.odu.edu/finance for summer tuition and refund dates and information). It pays (literally!) to figure out right away whether or not you plan to continue the course.

(2) Suggestions for Homework

Homework will be submitted through http://www.masteringphysics.com/. All deadlines are hard and fast - (that includes late-night technical glitches).

- Typically, HW problems are keyed towards new "tools" covered in the chapter they are attached to. If a problem in Chapter 7 asks you to calculate the speed of an object after falling in Earth's gravitational field, chances are you should use "Energy" to solve this problem (which is the chapter title).

- If you don't have enough time to thoroughly study the book, at least make sure you go over several of the examples and "check yourself" questions for each chapter. Try to "think for yourself", by covering up the solution and first trying your own hand at it. If you are really pressed for time (HW deadline), try to find examples that look similar to the problem at hand and see which tools are applied how (and why).

- Do not wait until the last minute before the deadline to submit your answers - there could be a last-minute technical problem and there won't be any extensions! Do not even wait until the last day, in fact!
• For extra practice, you should do additional problems/exercises (and the "Review Questions") in the book. Try to get as far as possible on your own, and then ask me (or a fellow student) for help where you need it.

• I can do only a few sample problems in class. However, make sure you benefit at least from the ones I do by asking questions if I'm doing something you can't follow. I'd rather have you understand one worked-out example than getting confused by a torrent of several running by too quickly.

• Doing problems is not easy, but you will get better at it with practice. Unfortunately, there is no shortcut or a simple collection of "recipes" - you need to understand the underlying concepts to solve a problem.

• Often it helps to work with other people. Bouncing ideas and questions of each other may clear things up - and there's often someone experienced around to ask if you really get stuck.

**Get involved:** Tell me (via email, office hour, after class, phone) what you would like me to do or change to make the learning experience more productive for you. However, don't expect miracles: We can't simply reduce the material to be covered by a large fraction, so be prepared to offer trade-off options ("do more of this and less of that"). Remember, if you don't come to class, don't do the assignments on time, and never come office hours, we can't help you.

(3) **Suggestions on how to prepare for tests and exams**

Many of the suggestions above for the homework also apply for the preparation for a midterm or final exam. In particular, the best preparation for exams is to do both your regular homework and maybe a couple extra "practice exercises" every week. (Note: You should have gotten a compendium volume "Practicing Physics" with your text book. This is full with extra problems to work on and the solutions are given). But to get anything out of that, you really have to work hard at getting the answer on your own. Don't expect your fellow classmates to "just do the problems for you". Not only is this against my rules, but it also deprives you of the learning process. Even if you don't get the final answer (right), if you have at least made a serious attempt, you will understand the correct solution better and be able to see where you may have troubles or weak areas.

• When you study the book, focus on the summaries at the end of each chapter and the "Review Questions". Make sure you understand the terms listed (read the relevant part of the chapter in the book if in doubt) and find at least one example in the text that illustrates each concept. Do all the "check yourself" problems in the text by covering up the solution first, then check! Make use of additional study material that came with the book, and go to the book website to check out the animated figures and video clips. And try to come up with your own examples from everyday life where you can apply what you learned in class - this will make it more real for you. (Example: braking distance of your car quadruples when
speed doubles -> kinetic energy and work; how long for a stone to fall into the water when thrown off a bridge -> gravity, acceleration; riding an amusement park ride -> acceleration, velocity and position; angular motion...) It's a good idea to keep a "reading log" while you read the book - jot down anything that you think might be important to remember, as well as anything that seems unclear (so you can ask someone later on).

- Go over past homework problems. Often an exam problem is just a variation of a previous homework problem. Try to remember (or reconstruct) which concepts were used and how you could tell those were the relevant ones. Look at the MasteringPhysics solution (visible as soon as the deadline is past).

- Take a look at the ExamFormulaSheet (or one page hand-written formulas) you are supposed to bring for the tests/exams. It contains equations and formulae that you might need during the exam. Try to recollect where and how each of these equations were introduced, and what situations they apply to (again, look for examples in the book).

- Remember, midterm exams (and "extended clicker quizzes") will cover the chapters in the book treated in class up to the day before the exam, beginning with the first chapter treated after the previous test (for the second). However, some "background knowledge" from all of Physics 101 may be needed to answer a given question. The final exam covers all material equally.

Finally, don't wait until the last moment. Spend a couple hours each week reviewing material and maybe 1-2 hours each day before the exam to prepare yourself. This is more efficient than cramming for one night (not only will you be tired, you will also forget everything more quickly again). Recent research shows that you learn more if you make sure you sleep enough during the night!