Walters State Community College
Course Syllabus for PHYS 2110, “Physics I”
2012 - 2013

Instructors: Dr. Sean M. Cordry, Associate Professor of Physics, 118 NCSI, (423) 585-6764, Email: Sean.Cordry@ws.edu
Dr. Eugene de Silva, NSCI 128, Phone 423-585-6890, E-Mail: eugene.desilva@ws.edu
Office Hrs: Posted outside instructor’s door
Dpt. Contact: (423) 585-6865 (Mrs. Sherry Woody), FAX: (423) 585-2762


Catalog Course Description: A calculus-based course intended primarily for students in science, mathematics, engineering and other technical fields. Mechanics, wave motion, fluids, and sound. (Prerequisite: MATH 1910) 3 hours lecture, 4 credits

Welcome!
Hello, and welcome to “Physics I.” This four-credit course begins your introduction to physics as an academic discipline. Additionally, it will contribute towards your Natural Science General Education Core Requirements. The class will be divided into four sections: Kinematics – how we describe motion, Forces and Projectiles – what causes motion to change, Conservation Laws – limits on what can happen and how quickly, and finally, Oscillations and Fluids – a simple introduction to vibrations and pressure.

Student Learning Outcomes
Here are your student learning outcomes; in other words, these are the things you should know how to do at the end of the semester.

1. Kinematics and Forces (Units, Physical Quantities, Vectors, Linear Motion, 2D & 3D Motion, Newton’s Laws of Motion, Gravitation)
   a. Distinguish the different characteristics of both uniform and accelerated motion for linear, circular and parabolic trajectories in terms of speed, velocity and acceleration.
   b. Use vectors appropriately for displacement, velocity, acceleration, and force situations.
   c. Correctly apply the kinematics equations to a variety of real-world scenarios involving linear, circular and parabolic behavior.
   d. Apply a formal problem-solving and estimation techniques to a variety of different problems and situations.
   e. Describe the role of forces in static and dynamic situations.
   f. Apply knowledge of forces to solve a variety of acceleration scenarios.
   g. Calculate times-of-flight and other characteristics of projectile motion for a variety of situations.

2. Newton’s Ideas in Action (Friction, Interacting Systems, Orbits, Gravitation, Rotation, Torque)
   a. Describe the origins of friction, explaining the different types of friction, and solve appropriate force and kinematics problems involving friction.
   b. Explain the differences between tangential and centripetal acceleration, utilizing these concepts in appropriate kinematic situations.
   c. Use the concept of equilibrium to compute torques and forces in appropriate situations.
   d. Define Hooke’s Law and use it calculate forces involving linear springs.

   a. Explain how momentum and energy are transferred in elastic and inelastic collisions.
b. Use conservation of energy and conservation of momentum to solve a variety of real-world problems.

c. Explain the relationship between “work”, energy and power.

d. Describe how energy can be used to set limits on events or actions.

4. **Thermodynamics** (Ideal Gas Law, Calorimetry, Phase Changes, 1st & 2nd Laws of Thermodynamics, Gas Cycles, Heat Engines, Entropy, Chaos Theory)

   a. Be able to solve a variety of problems involving state variables for an ideal gas, as well as calculating work done through various cycles.

   b. Compute temperature changes and phase changes based on heat input or output in an object; or, to do the same regarding internal energy or work changes for a system.

   c. Explain the first two laws of thermodynamics.

   d. Describe the basic ideas of entropy and characteristics of non-linear, chaotic systems.

**Performance Indicators**

In order to issue you a grade for your learning, I have to have some indicators that give me a basis for judging what you’ve learned. There will be reading quizzes, tests, homework, a laboratory grade, and a final exam. The table below shows how the various “events” will be incorporated into your final grade.

| Indicator          | %  | Details                                                                 | If missed (excused)...
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Unit Quiz</td>
<td>50</td>
<td>Covers conceptual and definitive aspects of recent material. Quizzes are not cumulative. All tests must be taken to pass the course.</td>
<td>Missed quizzes are handled on a case-by-case basis. Students should provide notice at least 48 hours in advance; generally, tests will be made-up within a week of the original test date.</td>
</tr>
<tr>
<td>Pre-Class Quizzes</td>
<td>15</td>
<td>Online material to be completed prior to corresponding lecture. Grade is based on attempt at completion.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Course Journal</td>
<td>10</td>
<td>Purchase a dedicated, composition style Journal for this course. You will use this notebook for recording the solutions and work to your homework problems; making notes, diagrams and conclusions from your lab experiences. You will be able to use this notebook during tests and the final exam.</td>
<td>Consultation with the department chair and the division dean will be required. Notice must be given two weeks in advance.</td>
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<tr>
<td>Final Exam</td>
<td>25</td>
<td>Comprehensive exam broadly covering all topics of course content.</td>
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The following performance levels will be used for issuing grades.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum Percent</th>
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<tbody>
<tr>
<td>A</td>
<td>≥90</td>
</tr>
<tr>
<td>B</td>
<td>80</td>
</tr>
<tr>
<td>C</td>
<td>70</td>
</tr>
<tr>
<td>D</td>
<td>60</td>
</tr>
<tr>
<td>F</td>
<td>&lt;60</td>
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</tbody>
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If you feel that there has been an error in the grading of an individual test or assignment, please let me know within a week of getting it back; I will certainly correct any errors in grading, and I’m happy to consider giving additional credit where it is merited. If you are over-awarded credit, you may consider it a fortuitous gift of Chance; i.e., if you get five points, but only deserved two, I won’t take those extra three points away from you. After one week of being returned, all assigned scores are “locked-in” and will not be changed.

**How to Survive This Course with Your Sanity Intact**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Quant (approx)</th>
<th>Time per (hrs)</th>
<th>Total Time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>6</td>
<td>1 - 3</td>
<td>6 – 18</td>
</tr>
<tr>
<td>PCQ’s</td>
<td>30</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Homework</td>
<td>30</td>
<td>2.5 – 4</td>
<td>75 – 120</td>
</tr>
<tr>
<td>General Study</td>
<td>230</td>
<td>.5</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>126 – 183</td>
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</table>
The traditional rule-of-thumb for time spent on any one particular course is this: for every credit-hour of class, you should spend two hours outside of class. As I have put your assignment list together, I have done so with this rule-of-thumb in mind; the chart at right is my estimate of how much time this course will require of you. (Naturally, some of you will need more time, and others less.)

Watch a baby learning to walk: does the baby feel like a failure whenever it falls down? No. Does it throw its arms up in frustration and figure that it just doesn’t have the gifts necessary to be a Walker? Of course not. We have the marvelous ability of being able to learn from our mistakes; falling down is the baby’s most powerful tool for learning to walk. After nearly two decades of watching babies and others, here are some pointers that will help you tremendously; take them to heart.

1. **Get used to mistakes.** As I mentioned, they are a natural part of the learning process. Be patient with yourself. Do your best, but don’t expect to be flawless when you are just learning.
2. **Get yourself into a routine.** Good habits and routines are life-savers. Find a regular time and place to do your studying and reading. Don’t study math or physics late at night.
3. **Get a study buddy.** Two (or three) heads are better than one. (Caution: too many heads turns into a party very easily.)
4. **Get plenty of sleep.** People in the U.S. are sleep-deprived, and college students are among the worst offenders. Lack of sleep will have a strong negative effect on your performance in this course. Sleep deprivation leads to loss of short-term memory, decrease in analytical abilities, poor performance on math tasks, and a weakened immune system.

### About Class Time

My task is something like a museum guide: you will get a general idea about a museum display on your own, but the guide will point out the especially interesting aspects and overlooked details. Similarly, I will focus classroom time on the more difficult concepts and ideas. Most of the time I will try to have active things for us to do, so bring your calculator and come prepared to participate. It will be rare when I just give you a straight lecture where you will just sit and take notes.

### Classroom Expectations

My expectations for you are no different than you would have for yourself attending a concert: you would want to arrive on-time; you would want a good seat; you would want to pay close attention so you didn’t miss anything; you would expect others to allow you to enjoy the concert; in short, you would want to maximize your experience. So how do you maximize your experience in class? Be on time. Get a good seat. Pay close attention. Allow others to pay attention.

I also don’t expect any more or less from you than I do from myself:

1. **I’ll come to class ready.** You can too by reading the sections before class. I won’t be a textbook with lips, so you’ll need to keep up with the reading. **Always** start your reading by looking at the pictures first and then reading the summary; this will give your brain a mental map of the information that is coming in.
2. **I won’t sleep through class.** You should make sure you get plenty of rest. Studies show that a lack of sleep leads to memory retention problems and a decrease in analytical thinking ability.
3. **I will give you my full attention.** Please give me yours. “Texting” or “surfing the web” during class is rude and unacceptable. You have chosen to come to class. I will make it worth your time; you should too.
4. **I’ll often have something to drink – and sometimes a snack, but I’ll always take care of my trash and leave the room clean.** If you want to bring a snack or drink, that’s fine; just make sure that the next person to sit at your desk can’t tell.
5. I won’t talk about you behind your back. If I should do or say something that seems strange or out-of-line, please come talk to me about it. (If you feel awkward talking to me about it, please talk with Dr. Jeffrey Horner; he’ll keep your identity confidential and relay your concern to me.)

Always bring your calculator.

I look forward to having a good semester with you. It will be a great adventure!

I reserve the right to make changes to this syllabus in the event that I might deem such necessary to enhance the learning experience of all students.

Sean M. Cordry

Additional Important Information

- Students should attend the first day of class or contact the instructor prior to the first class. Failure to do this may result in being dropped from the class.
- Plagiarism, cheating, and other forms of academic dishonesty are prohibited.
- Students with disabilities must register with Student Support Services (CCEN), Room 262 (phone 423-585-6892) if they need any special facilities, services, or consideration.
- Students in need of tutoring assistance are encouraged to contact the Office of Student Tutoring located in the College Center (CCEN), Room 261. The phone number is 423-585-6920.
- Students receiving any type of financial aid or scholarship should contact the Financial Aid Office before making any changes to their schedule. Schedule changes without prior approval may result in loss of award for the current term and future terms.
- Students who have not paid fees on time and/or are not correctly registered for this class and whose names do not appear on official class rolls generated by the Admissions and Records Office will not be allowed to remain in class or receive credit for this course.
- Cellular phone use during classroom interaction is prohibited. Cellular phones must be turned to the non-audible mode until after class, at which time calls can be received or checked. (See the Walters State Catalog/Handbook)
- For information related to the cancellation of classes due to inclement weather, please check the college’s Web site at www.ws.edu or call the college’s student information line, 1-800-225-4770, option 1; InfoConnect, (423) 581-1233, option 1045; the Sevier County Campus, (865) 774-5800, option 7; or the Greeneville/Greene County Center for Higher Education, (423) 798-7940, option 4. Also, please monitor local TV and radio stations for weather-related announcements. For additional information on this policy see the college catalog.
- In the event of a pandemic or other college declared critical event that impacts the college’s ability to proceed with academic course activities as planned, the college reserves the right to alter this course plan. In the event of a pandemic or other event, please refer to the college’s home web page, www.ws.edu or call InfoConnect, (423) 581-1233 for further information.
- Regular class attendance is a student’s obligation. (See the Walters State Catalog/Student Handbook) If for some reason a student misses class, it is his or her responsibility to see the instructor regarding missed assignments and/or activities and to be prepared for the next class. Excessive absences may substantially lower the semester grade. The college requires the instructor to keep accurate records and to report when students are not attending class.
- The wearing of hats and caps in class is not allowed! Students will be asked to remove their hats and caps.

WSCC Catalog Notification Statement:
All students attending Walters State Community College, regardless of the time and location of the class, must abide by the rules and regulations outlined in the current Walters State Catalog/Student Handbook and the current “Walters State Timetable of Classes.” A copy of the Catalog/Handbook and the “Timetable of Classes” may be obtained from the Admissions Office on the Main campus or at any of our off-campus sites. You may also access the Catalog/Handbook on-line at the following web address: http://www.ws.edu/catalog.

Alternative Teaching Plan
In the event of a pandemic or other college declared critical event, the lead faculty member for this course will use eLearn to communicate with the students. If the lead faculty member is affected by this event, another member from the teaching team will assume instruction for the course. The course will continue utilizing an online format of instruction and testing.

**ATTENTION:** The Natural Science faculty members are concerned with proper academic advising of students in ALL Pre-Professional programs. It is our explicit desire to help you with any advising problems you may encounter.