Walters State Community College
Course Syllabus for PHYS 20, “General Physics I”
2012 – 2013

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Required Text: College Physics: a Strategic Approach, 2nd Ed., Knight, Randall D., Jones, Brian, and

Catalog Course Description: An introductory pre-calculus survey course in general physics including:
mechanics, work and energy, rotation and vibration, wave motion, fluids and sound.
(Prerequisite: MATH 1720) 3 hours lecture, 4 credits

This four-credit course introduces students to physics as an academic discipline, contributing towards degree
programs and the Natural Science General Education Core Requirements. The class will be divided into four
sections: Kinematics and Forces – describing motion and what causes it to change, Newton’s Ideas in Action –
expanding kinematic and Newtonian principles to a variety of contexts, Conservation Laws – limits on what can
happen and how quickly, and finally, Thermodynamics – how energy flows and is exchanged on a microscopic
scale.

Student Learning Outcomes
Here are the student learning outcomes; in other words, these are the things students 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.

3. **Conservation Laws** *(Work, Kinetic/Potential Energy, Mechanical Energy Conservation, Momentum, Impulse, Collisions)*
   
   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 and Expectations**
In order to evaluate student progress towards the learning outcomes, several performance indicators will be used: reading quizzes, tests, homework, a laboratory grade, and a final exam. The table below shows how the various indicators will be incorporated into your final grade.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>%</th>
<th>Details</th>
<th>If missed (excused)…</th>
</tr>
</thead>
<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>
</tr>
<tr>
<td>Final Exam</td>
<td>25</td>
<td>Comprehensive exam broadly covering all topics of course content.</td>
<td></td>
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Excused absences include documented illness, unexpected family situations or emergencies, and student representation of WSCC at various activities.

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>
</tr>
</tbody>
</table>

If the student identifies a grading error in an individual test or assignment, the student should notify the instructor within a week of the test or assignment being returned. Grading errors will receive serious attention from the instructor and appropriate corrections will be made if necessary. In the event that credit is over-awarded, the student should notify the instructor as a courtesy; the student may consider the over-award a fortuitous gift of Chance, as the student’s score will not be reduced. After one week of being returned, all assigned scores are “locked-in” and will not be changed.

The traditional rule-of-thumb for time spent on any one particular course is this: for every credit-hour of class, a student should spend two hours outside of class. Tests and assignments have been constructed with this rule-of-thumb in mind; the chart at right estimates the student’s out-of-class time requirements. Naturally, these are approximate; some students require more time, and others less.

<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>
</tr>
<tr>
<td>Weekly Average</td>
<td></td>
<td>8 – 12 hrs/wk</td>
<td></td>
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</tbody>
</table>
In-class expectations for the student are no different than expectations for attending a concert, performance or movie: arrive on-time; get a good seat; pay close attention so as not to miss anything, and allow others to enjoy the event. The expectations are parallel to what the instructor expects from him- or herself:

1. **The instructor will arrive well-prepared.** The student should too by reading the sections before class. The instructor will not be a textbook with lips, so students need to keep up with the reading; this will both broaden and deepen the student’s learning experience. Students should **always** start reading by looking at the pictures first and then reading the summary; this provides the brain with a mental map of the information that is coming in – much like labeling a filing cabinet prior to filling it with folders.

2. **The instructor will not sleep through class.** Students should 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. The instructor may have something to drink – and sometimes a snack but **will always take care of the trash and leave the room clean.** If a student brings a snack or drink, that is fine; however, the student should take care that the next person to sit at that desk has a clean, trash-free area.

5. **The instructor will not talk negatively about individual students to others.** If the instructor should do or say something that seems strange or out-of-line, please talk to the instructor about it as soon as possible. Many conflicts are simply the result of miscommunication, and quick resolution can restore trust and a positive experience for all parties. If the student is uncomfortable discussing an issue with the instructor, the student should talk to the department chair (Dr. Sean Cordry) or the division dean (Dr. Jeffery Horner) instead; they will accurately relay the student’s concern to the instructor, while sensitively honoring student privacy.

6. **Tobacco products are not allowed in class.**
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.

This syllabus last modified on Friday, August 24, 2012 by
Physics Department chair, Dr. Sean M. Cordry.