Walters State Community College
Course Syllabus for PHYS 2120, “Physics 2”
Spring 2015

Instructor: Dr. Sean M. Cordry, Associate Professor of Physics
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Office Hrs: Posted online
Dpt. Contact: (423) 585-6865 (Mrs. Kris Weinreich), FAX: (423) 318-2762

Required Text: OpenStax College Physics (http://openstaxcollege.org/textbooks/college-physics), subscription to Sapling Learning

Catalog Course Description: Thermodynamics, electricity and magnetism, optics, atomic and nuclear physics. (Prerequisite: MATH 1910 and PHYS2110; coreq: PHYS 2121 and MATH 1920) 3 hours lecture, 4 credits

Welcome!
Hello, and welcome to “Physics II.” This four-credit course continues 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: Wave Mechanics – describing the propagation of oscillatory motion; 20th-Century Physics – introducing relativity, quantum mechanics, and atomic and nuclear physics; Electrostatics – the origins and nature of electric fields; and finally, Electromagnetism – the movement and flow of electrons.

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. Wave Mechanics
   a. Explain the basic qualitative and quantitative aspects of wave behavior.
   b. Calculate wavelengths, frequencies and Doppler shifts as appropriate to the generally accepted level of this course.
   c. Describe the phenomena of diffraction and refraction, as well as solve a variety of computational problems involving those concepts.
   d. Explain the effects and causes of standing waves; make appropriate calculations of such waves.

2. 20th-Century Physics
   a. Explain the concept of energy quantization and how it pertains to light and electron orbitals.
   b. Describe matter waves and explain the Uncertainty Principle.
   c. Describe the basic make-up of nuclei, and the types and origins of nuclear radiation; utilize the concept of half-life.
   d. Explain the “standard model” of particle physics.

3. Electrostatics
   a. Describe the origins of charge; utilize Coulomb’s law to calculate forces between charges.
   b. Explain the concept of electric field and its relationship to charges.
   c. Describe Gauss’ Law and its utility.
   d. Differentiate and utilize the relationship between electric field and electric potential.
4. **Electromagnetism**
   a. Describe how currents can lead to magnetic fields; calculate magnetic fields based on a limited number of simple current geometries.
   b. Explain the concept of flux in the context of Lenz’s law.
   c. Explain the fundamental cause of electromagnetic waves.
   d. Explain the notion of electric potential and how it can be used to calculate potential energy changes.

**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.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>%</th>
<th>Details</th>
<th>If missed (excused)…</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tests</td>
<td>30</td>
<td>Covers conceptual and definitive aspects of recent material. Tests are not cumulative. All tests must be taken to pass the course.</td>
<td>Missed tests are handled on a case-by-case basis. Students should provide notice at least a week in advance; generally, tests will be made-up within a week of the original test date.</td>
</tr>
<tr>
<td>Activities &amp; Homework</td>
<td>30</td>
<td>Homework will be completed through online resources. Occasional in- or out-of-class activities will be collected for a grade.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Pre-class Quizzes</td>
<td>20</td>
<td>Before each class, students should complete the online quiz over material they should know before coming to class. Grades will be assigned on completion of quizzes.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20</td>
<td>Comprehensive exam broadly covering all topics of course content.</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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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>
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<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>
</table>

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.

**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’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.

4. 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 anonymous 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
<table>
<thead>
<tr>
<th>Week</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
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<tbody>
<tr>
<td>1</td>
<td>MLK Day</td>
<td>MLK Day</td>
<td>1/21</td>
<td>1/22</td>
<td>SHC</td>
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<tr>
<td></td>
<td>College Closed</td>
<td></td>
<td>1/23</td>
<td>Math</td>
<td>End Add</td>
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<tr>
<td>2</td>
<td>Wave Basics</td>
<td>Waves Basics II</td>
<td>Wave Mathematics</td>
<td>Traveling &amp; Standing Waves</td>
<td>Osciscopes, Beating waves</td>
</tr>
<tr>
<td></td>
<td>Types, Reflection, Refraction</td>
<td>Interference, Interference</td>
<td>Wave Mathematics</td>
<td>Traveling &amp; Standing Waves</td>
<td>Osciscopes, Beating waves</td>
</tr>
<tr>
<td>3</td>
<td>Ray Optics, I</td>
<td>Physical Optics, I</td>
<td>Physical Optics, II</td>
<td>Measure Index of Refraction</td>
<td>Lenses Lab</td>
</tr>
<tr>
<td></td>
<td>Reflection, Diffraction</td>
<td>Interference, Interference</td>
<td>Physical Optics, II</td>
<td>Measure Index of Refraction</td>
<td>Lenses Lab</td>
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<tr>
<td>4</td>
<td>Physical Optics, II</td>
<td>Sound Waves, I</td>
<td>Sound Waves, II</td>
<td>Sound Waves, II</td>
<td>Telescopes, Microscopes</td>
</tr>
<tr>
<td></td>
<td>Diffraction, Interference</td>
<td>Sound Waves, I</td>
<td>Sound Waves, II</td>
<td>Sound Waves, II</td>
<td>Telescopes, Microscopes</td>
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<tr>
<td>5</td>
<td>Review</td>
<td>Geomagnetism</td>
<td>2/19</td>
<td>2/20</td>
<td>Test 1</td>
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<td></td>
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<td>Magnets</td>
<td></td>
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<tr>
<td>6</td>
<td>B sources</td>
<td>EMFs</td>
<td>Constant Circuits</td>
<td>B sources</td>
<td>Force of B on paper clip</td>
</tr>
<tr>
<td></td>
<td>Materials, Bid-Savart</td>
<td>EMFs</td>
<td>Constant Circuits</td>
<td>B sources</td>
<td>Force of B on paper clip</td>
</tr>
<tr>
<td>7</td>
<td>DC Power</td>
<td>Ohmic Materials</td>
<td>RC-decay</td>
<td>Tesla</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Batteries, Resistors, Volts/Current</td>
<td>Ohmic Materials</td>
<td>RC-decay</td>
<td>Tesla</td>
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Spring Break!
Course Ground Rules

All students attending Walters State Community College, regardless of the time, location, or format 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. The Catalog/Student Handbook and the Timetable of Classes are online at: http://ws.edu

Students must attend the first day of on-ground class or contact the instructor prior to the first class. Failure to do this may result in being dropped from the class. Excessive absences may substantially lower the course grade.

Students enrolled in web courses must follow the course attendance policy defined for online attendance during the first week of class and throughout the term. Failure to do this may result in being dropped from the class during week one OR may result in the accrual of absences which may negatively impact the student’s grade in the course.

Plagiarism, cheating, and other forms of academic dishonesty are prohibited. The minimum penalty for cheating is a “0” (zero) on the examination or assignment. Academic dishonesty may result in an “F” for the course. Additional information can be found in the WSCC Catalog/Student Handbook at: http://ws.edu.

Students with disabilities must register with Student Support Services each semester in the Student Services Building, Room U134 (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 as follows:

- Morristown Campus - Student Services Building Room L107 – (423) 585-6920
- Greeneville Campus – Room 420 - (423) 798-7982
- Sevierville Campus - Marshall-Maples Hall Room 118 – (865) 286-2787
- Claiborne Campus – Room 123A (423) 851-4761

Specific tutoring assistance in mathematics and writing is available in-person and online as follows:

- Morristown Campus – English Learning Lab – HUM 120 – (423) 585-6970
  - https://www.ws.edu/academics/humanities/writing-lab
- Morristown Campus – Mathematics Lab – MBSS 222 - (423) 585-6872
  - http://ws.edu/academics/mathematics/learning-lab

Students who need assistance with computing and technology issues should contact the IET Helpdesk by phone at Morristown: 423-318-2742 Greeneville: 423-798-8186 or Sevierville: 865-286-2789 or on-line access at: http://helpdesk.ws.edu/.

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 Walters State student information system (StarNET) will not be allowed to remain in class or receive credit for this course.

Electronic devices must not disrupt the instructional process or college-sponsored academic activity. Use of electronic devices is prohibited unless use of the device is relevant to the activity and use is sanctioned by the faculty member in charge. Electronic devices that are not relevant to the activity or sanctioned by the faculty member in charge should be set so that they will not produce an audible sound during classroom instruction or other college-sponsored academic activity.

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 Campus (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 at: http://ws.edu
Dual Enrollment students attending on a high school campus should refer to the high school inclement weather cancellations.

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 for any course regardless of format. (See the Walters State Catalog/Student Handbook) If a student misses class, it is his or her responsibility to contact the instructor regarding missed assignments and/or activities and to be prepared for the next class assignment.

All forms of student Financial Aid may be jeopardized or lost due to the lack of Satisfactory Academic Progress in one or multiple courses. Lack of Satisfactory Academic Progress may negatively impact a student’s degree/certificate completion pace and further jeopardize Financial Aid eligibility.

WSCC Catalog Notification Statement:
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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.

General Education Core Competency (CC) courses – ENGL 1010, SPCH 2010, MATH 1530 or 1630 or 1710, and CPSC 1100 or MGMT 1100 – must be completed by the time the student completes 30 hours of college credit towards a degree at Walters State Community College. Completion of the courses with a passing grade is the primary form of documentation of competency. Alternate methods of documentation are described in the College Catalog (“General Education Competency Requirements”).

Drop Dates for Current Term
The last day to drop a course or withdraw from the college-full term for Spring 2015 term is April 2, 2015.

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.