PHYS 212 Physics II with Calculus (Spring 2015)

Location: Micron Corporate-Bldg 17-103C  Time: ThFr 4:00 – 5:50pm

Prerequisites: PHYS 211, MATH 170
Corequisites: PHYS 212L, MATH 175

Text: [Knight Physics for Scientists and Engineers 3e, Vol. 3-4, 2011 Pearson](#)
URL: course materials posted on Blackboard
Mastering Physics Registration: [MPYOUNGWORTH77077](#); ZIP is [83725](#)
Instructor: [Dr. Richard N. Youngworth](#)  richardyoungworth@boisestate.edu
Office Hours: ThFr 3:30 – 4:00pm and ThFr 6:00 – 6:45pm, or by appointment

<table>
<thead>
<tr>
<th>Week</th>
<th>Monday Date</th>
<th>Topics</th>
<th>PHYS212L Lab</th>
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<tbody>
<tr>
<td>1</td>
<td>1/12</td>
<td>Electric Charge/Electric Force</td>
<td>No lab</td>
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<td></td>
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<td>Orientation; Chapter 25 (25.1 – 25.5)</td>
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<tr>
<td>2</td>
<td>1/19</td>
<td>Electric Field</td>
<td>Electrostatics</td>
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<td>Chapter 26 (26.1 – 26.6)</td>
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<td>3</td>
<td>1/26</td>
<td>Electric Potential</td>
<td>Electric field mapping</td>
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<td>Chapter 28 (28.1 – 28.7)</td>
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<td>4</td>
<td>2/2</td>
<td>Potential/Capacitors</td>
<td>Capacitors</td>
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<td>Chapter 29 (29.1 – 29.5)</td>
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<td>5</td>
<td>2/9 Exam 1</td>
<td>Electric Current</td>
<td>Ohm’s Law</td>
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<td>Chapter 30 (30.1 – 30.5)</td>
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<tr>
<td>6</td>
<td>2/16</td>
<td>Circuit Fundamentals</td>
<td>Bulbs</td>
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<td>Chapter 31 (31.1 – 31.4, 31.6 – 31.7, 31.9)</td>
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<td>7</td>
<td>2/23</td>
<td>Magnetic Field 1</td>
<td>RC Circuits</td>
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<td>Chapter 32 (32.1 – 32.5)</td>
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<td>8</td>
<td>3/2 Exam 2</td>
<td>Magnetic Field 2</td>
<td>Earth’s Magnetic Field</td>
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<td>Chapter 32 (32.7 – 32.8)</td>
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<td>9</td>
<td>3/9</td>
<td>Electromagnetic induction</td>
<td>Magnetic Field Determination</td>
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<td>Chapter 33 (33.1 – 33.10)</td>
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<td>10</td>
<td>3/16</td>
<td>AC Circuits</td>
<td>AC Circuits (not in manual)</td>
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<td>Chapter 35 (35.1 – 35.6)</td>
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<td>11</td>
<td>3/23</td>
<td>No Classes, Spring Break</td>
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<tr>
<td>12</td>
<td>4/6 Exam 3</td>
<td>Superposition: Standing Waves</td>
<td>Resonance in Air Columns</td>
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<td>Chapter 21 (21.1 – 21.4);</td>
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<td>Week</td>
<td>Date</td>
<td>Topic</td>
<td>Notes</td>
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<td>13</td>
<td>4/13</td>
<td><strong>Superposition: Interference/Wave Optics</strong>&lt;br&gt;Chapters 21 and 22 (21.5 – 21.7, 22.1 – 22.4)</td>
<td>Double Slit</td>
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<td>14</td>
<td>4/20</td>
<td><strong>Ray Optics</strong>&lt;br&gt;Chapter 23 (23.1 – 23.4, 23.6 – 23.8)</td>
<td>Reflection/Refraction</td>
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<td>15</td>
<td>4/27</td>
<td>TBA&lt;br&gt;Chapter ?</td>
<td>Lenses</td>
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<td>16</td>
<td>5/4</td>
<td><strong>Exam 4</strong>&lt;br&gt;Finals</td>
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The formula used for calculating your grade will be as follows:

\[ G = E_1(0.19) + E_2(0.19) + E_3(0.19) + E_4(0.19) + H(0.2) + P(0.04) \]

where

- \( G \) is your final percentage grade in the course
- \( E_1, E_2, E_3 \), and \( E_4 \) are your percentage grades for exams one, two, three and four (the final) respectively
- \( H \) is your percentage homework grade
- \( P \) is your percentage participation grade

Please note that your grade will be calculated using the above formula, and your percentage scores can always be checked on Blackboard at any time (except that the homework grade will not show up in Blackboard until the end of the course, it can be checked directly on Mastering Physics). The grade calculated in Blackboard is the grade you will get. Please do not ask me to give you a higher grade. Your final grade will be truncated to a full percentage point in order for a letter grade to be assigned from the above scale. (Examples: 90.07% is an A-. 89.86% is a B+.)

**EXAMS:** 76% of your grade is based on the exams. The exams are based on the textbook readings, the examples in the text, the homework, and the class lectures. **ALL EXAMS WILL BE COUNTED, AND NO MAKE-UP EXAMS WILL BE GIVEN.** There will be four in-semester exams (worth 19% each, including the final exam).

All four course exams will take place in the Blackboard Testing Center, located on the 4th floor of the education building. You must schedule your exam sometime on Monday, Tuesday, or Wednesday of the week in which the exam is scheduled. Once your exam is scheduled, you must be on time. If you are more than 10 minutes late for your appointment you may not be allowed to complete your exam. It is the student’s responsibility to understand the policies and procedures of the Testing Center, which shall be enforced in full. The testing center policies are listed at [http://at.boisestate.edu/tools-and-facilities/online-testing-center/](http://at.boisestate.edu/tools-and-facilities/online-testing-center/). Some highlights of the testing center policies:
• Schedule your appointments early. If you procrastinate you might find that you
must schedule your exam during an inconvenient time or that the appointment
spots might fill up.
• The Testing Center requires a valid student ID.
• Allowed materials consist of an instructor-provided formula sheet (no external
formula sheets or note sheets allowed) to be handed out by the proctor at the
Testing Center, and a paper-only language dictionary (no electronic dictionaries).
One sheet of scratch paper at a time will be provided by the Testing Center. The
formula sheet and scratch paper will be collected at checkout. Be prepared to have
the proctors collect this material when you leave.
• Calculators will be provided by the Testing Center. The model of calculator will
be a TI 30-X IIS. This is a standard scientific calculator, however you may want
to familiarize yourself with the standard functions on this calculator before you
take your exam. The exams will not require anything more complex than the use
of basic algebraic functions (square roots, trig functions, etc.)
• No mobile phones are allowed in the Testing Center.
• Any example of academic dishonesty (including but not limited to using non-
sanctioned test aids, crib-sheets during the exam, using cell phones, observing the
work of others in the testing center, etc.) will be reported and taken seriously by
the department and the university. Repercussions can include a zero on the exam,
an F in the course, or expulsion from the university, at the prerogative of the
instructor/department.
• To schedule your exam, proceed to the Testing Center page using the link above,
scroll down to the student column and click “Schedule and Exam.” Follow the
instructions and be prepared to enter your Broncoweb username/password. Also
note that early scheduling will get you the slot you really want for an exam.

ACADEMIC DISHONESY:
Academic integrity will be strongly enforced in this course. Any student caught cheating
on any assignment or exam may fail the assignment or exam in question or fail this
course dependent on a hearing with the course instructor. Academic Dishonesty is
defined in the Student Code of Conduct (Article 2, Section 18). It is strongly suggested
that you read and understand these definitions: http://osrr.boisestate.edu/scp-
codeofconduct-article2/#18.
Additional disciplinary action may be pursued through the Office of the Dean of
Students.

HOMEWORK: 20% of your grade is based on homework. Mastering Physics
Homework is on the web at http://www.masteringphysics.com. It is correlated with the
sections scheduled above and must be completed as scheduled on the web in order to
facilitate classroom discussion. Our class is called MPYOUNGWORTH77077 and the
ZIP is 83725. Homework problems will form the basis of some exam questions.
PARTICIPATION: 4% of your grade is based on class participation. This may include:

- Clicker questions. During the class some questions will be posed for you to consider, and the responses tallied using clickers. These are not quizzes, and as such it does not matter if you get the right answer, only that you attempt an answer. Points will be awarded upon receiving a response.
- Interactive lecture demonstrations. Some demos in class will be done allowing students to predict the outcome, discuss with peers, then the demo/experiment will be performed. Predictions will be collected via clickers. Again the correct answer is not important, just the attempt.

LEARNING ASSISTANT: There is a Learning Assistant (LA) matched with the PHYS212 course to facilitate group study sessions on a weekly basis that will help you succeed in this class. These study groups are open to anyone enrolled in this course who would like to stay current with the course material and understand the material better. Attendance at these sessions is voluntary, but extremely beneficial. Times and locations for study sessions can be found here: http://aae.boisestate.edu/tutoring and on the blackboard site for this course. Students who attend these interactive sessions will find themselves working with peers as they compare notes, demonstrate and discuss pertinent problems and concepts, and share study and test-taking strategies. Students are asked to arrive with their book, lecture notes, and questions to these informal, peer-led study sessions. Please ask the instructor for further information on LA sessions as required.

LECTURES & ASSIGNED READINGS: Class lectures relate closely to the assigned readings in the text. Students are expected to attend all lectures and participate actively in class. Consult the syllabus and read the assigned pages before the material is covered in class. As you read, write down any questions you have about the reading and the numbered examples, and ask questions in class.

FOUNDATIONAL STUDIES STATEMENT: Boise State's Foundational Studies Program provides undergraduates with a broad-based education that spans the entire university experience. PHYS 212: Physics II with Calculus satisfies five units of the Foundation Program's Disciplinary Lens-Natural, Physical and Applied Sciences (DL-N) requirement. It supports the following University Learning Outcome, along with a variety of other course-specific goals.

8. Apply knowledge and the methods characteristic of scientific inquiry to think critically about and solve theoretical and practical problems about physical structures and processes.

PHYS 212: Physics II with Calculus is designed to help students understand the ways in which the established laws of nature allow us to understand and predict future behavior of physical systems, as well as using scientific reasoning to acquire and analyze data. This course helps to achieve the goals of the Foundational Studies program by focusing on the
following course learning outcomes. After successful completion of this course, you will be able to:

- Solve problems using Maxwell’s equations to predict the behavior of a system of charges with particular initial conditions.
- Solve problems using concepts of wave motion to predict the behavior of elastic systems and optical phenomena.
- Apply Maxwell’s Laws and Energy Laws to solve common real world problems.
- Assess experimental data to verify or disprove a particular hypothesis.
- Represent physical problems using mathematical notation.
- Understand how the laws of physics have shaped technology and the environment.
- Effectively communicate experimental procedure as well as the underlying theory.

SYLLABUS: The syllabus describes the intended progression of the course. The syllabus and homework assignments will be revised as needed. Changes to the syllabus and the homework assignments will be posted on the course web page, which should be checked frequently for updates.