**DEPARTMENT OF PHYSICS**
Summer 2, 2017

PHYS2101  Introduction to Physics II (Calculus)
July 3 – July 27

Instructor:  Professor Chris Engelbrecht
Higgins 330
BC email:  engelbrc@bc.edu
Office Hours:  Mo, Tue, Thu:  1:00 pm – 4:00 pm

Text:  Principles of Physics (5th Edition) including access code to WebAssign
by Raymond A. Serway and John W. Jewett, Jr. (Cengage: Brooks/Cole)

Classes:  in Higgins 310 on Mo, Tu, Th  6:00 - 7:30 pm;
          7:50 - 9:50 pm

There are also 35 min recitation sections, each Tu and Th at 2:00 pm in Higgins 310. Note that since
there is no class on Tuesday 4 July there is an additional evening class on Wednesday 5 July, from
6:00 pm - 9:50 pm.

There is a separate, 1-credit laboratory (PHYS2051) associated with the course. It meets Mo, We, Th
4:00 - 5:50 p.m.  The two courses PHYS2101 and PHYS2051 need not be taken together.

**Course Description:** This is the second session of a calculus-based introduction to physics, primarily
for biology majors and premedical students. The development and application of classical physical
principles are covered, and students are introduced to more advanced mathematical techniques to extend
these applications. Emphasis is placed on problem-solving to better understand the implications of these
principles, as well as to develop analytical skills. Topics are electrostatics, electrical circuits, magnetism,
electromagnetism and electromagnetic waves, topics in physical optics, and basic concepts of special
relativity and quantum physics.

This course is equivalent to the same course offered during the regular school year, except for one
essential difference. The pace of the Summer course is *highly accelerated* and, as a student, you must
plan your participation in the course accordingly. In broad terms, we cover as much material in one class
day of the Summer course as we would cover in one week during the school year. A lot of work needs to
be done outside of class time (homework, quizzes and mastering the material for the exam). Therefore, it
is strongly recommended that students do not take any other courses concurrently and also not commit to
other obligations that would limit the daytime hours they have to devote to this course.

The syllabus is structured to follow the chapters in the textbook. Some *tentative* homework problems are
listed in the final columns alongside the chapters in the table below. Other problems may be assigned as
necessary. In order to help students keep up with the pace, each class will end with a subset of
homework problems that need to be completed online *before* the next class. In addition, there will be a
short quiz each day during the first (6:00 – 7:30 pm) session, assessing your understanding of the previous day's material. There is no make-up of online homework, quizzes or the final, but your lowest homework grade and your lowest quiz grade will be omitted when calculating your final grade.

Basis for course grade:

- Daily quizzes ≈ 25%
- Online homework ≈ 10%
- Final examination ≈ 65%

If you are a student with a documented learning disability seeking reasonable accommodations in this course, please contact the Connors Family Learning Center (617-552-8093); regarding all other types of disabilities, please contact the Disability Services Office (617-552- 3470).

Canvas

Canvas is the Learning Management System (LMS) at Boston College, designed to help faculty and students share ideas, collaborate on assignments, discuss course readings and materials, submit assignments, and much more - all online. As a Boston College student, you should familiarize yourself with this important tool. For more information and training resources for using Canvas, click here.

Course Objectives

1. Knowledge objective: After completing this course, you should have a working knowledge of the basic physical concepts that we use to describe the topics covered in the syllabus, i.e. electrostatics, electrical circuits, magnetism, electromagnetic induction, electromagnetic waves and physical optics, as well as a working knowledge of the actual physical processes and interactions that occur in nature, with regard to these topics. As a secondary knowledge objective, you should acquire a basic acquaintance with the concepts that we use to describe the topics of special relativity and quantum mechanics. The degree to which you have achieved these objectives will be assessed in your final exam.

2. Skills objective: Through your participation in this course, you are expected to develop certain fundamental skills, including the ability to construct solutions to physical problems in an effective and logical way and the ability to use the tools of calculus appropriately in solving these problems.

Deadlines and Late Work

Due to the highly accelerated nature of this course, there will be a zero tolerance policy for missing deadlines (including submission of late work). This strict approach is in your own best interest.

Scholarship and Academic Integrity

Students in Summer Session courses must produce original work. Academic dishonesty includes, but is not necessarily limited to, plagiarism, fabrication, facilitating academic dishonesty or cheating on exams or assignments. Scholastic misconduct may also involve, but is not necessarily limited to, acts that violate the rights of other students, such as depriving another student of course materials or interfering with another student’s work. Please see the Boston College policy on academic integrity for more information.
# Course Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Chapter # and Topic</th>
<th>Tentative Homework Problems</th>
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<tbody>
<tr>
<td>July 3</td>
<td>19. Electric Forces and Fields</td>
<td>18,21,33,39,54,62,65</td>
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<tr>
<td>July 6</td>
<td>20. Electric Potential, Capacitance, continued</td>
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<td>July 10</td>
<td>21. Electric Current, Circuits</td>
<td>26,34,35,41,45,49</td>
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<td>July 11</td>
<td>22. Magnetism</td>
<td>17,21,41,43,46,63,66,67</td>
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<td>July 13</td>
<td>22. Magnetism, continued</td>
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<td>July 17</td>
<td>23. Electromagnetic Induction</td>
<td>4,6,21,25,35,38,40,52,59</td>
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<td>9. Relativity</td>
<td>6,8,9,15</td>
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<td>July 20</td>
<td>25. Geometrical Optics</td>
<td>14,19,33,35,51,55</td>
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<td>26. Mirrors and Lenses</td>
<td>23,27,35,44,48,49</td>
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<td>27. Physical Optics, Interference</td>
<td>3,12,15,21,22,31,35,47</td>
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<td>July 24</td>
<td>28. Quantum Physics</td>
<td>9,11,17,29,33,58,60</td>
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<td>July 25</td>
<td>29. Atomic Physics</td>
<td>5,7,18,19,23,45</td>
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<td>11. Bohr's Hydrogen Atom</td>
<td>36,37,39,40</td>
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<td>July 27</td>
<td><strong>FINAL EXAMINATION</strong></td>
<td><strong>6-9 p.m.</strong></td>
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