COURSE INFORMATION
Physics 222 – Winter 2016
Classical Physics II

Lecture: Mo, We 15:00–17:05 BDC 153B
Instructor: Dr. Alexander Dzyubenko adzyubenko@csub.edu
Office Hours: Mon Wed 13:00 – 14:30, Tu 15:30 – 16:30 and by appointment
Office: Science III, Room 302 Phone: 654-2096

Lab Sections: Science II 283
Mo 7:30 – 10:00, Fr 10:00 – 12:30 Dr. Galina Dzyubenko gdzyubenko@csub.edu Office Hours: TBA
Tu 10:00 – 12:30, 12:45 – 15:15, Tr 10:00 – 12:30 Dr. Alexander Dzyubenko

Course Web page: http://www.csub.edu/~adzyubenko/Phys222 to be regularly updated

Text: Physics for Scientists and Engineers 9e Edition by R.A. Serway and J.W. Jewett
Hybrid (with Enhanced WebAssign Homework) © 2014 or Physics for Scientists and Engineers, Technology Update

Goals of this course: Very generally, we will try to address the following goals:
1. To acquire rather detailed qualitative physical understanding of the major physical notions and phenomena of thermodynamics and electricity and magnetism such as, for example, heat and thermal energy, electric and magnetic interactions, and electromagnetic induction
2. To develop mathematical skills and analytical methods
3. To develop problem solving skills
4. To enhance both oral and written communication skills appropriate to physics.

A rough schedule appears below. Lectures will cover only selected topics from the text but you will be responsible for all corresponding text material unless specifically told otherwise.

THERMODYNAMICS

The Zeroth Law of Thermodynamics
• Temperature
• Thermal Expansion
• The Ideal Gas Law

The First Law of Thermodynamics
• Heat
• The Transfer of Heat
• The First Law as a Statement of the Conservation of Energy

The Second and Third Laws of Thermodynamics
• The Efficiency of Furnaces and Refrigerators
• Entropy and Disorder
ELECTRICITY AND MAGNETISM

Maxwell's First Law and Circuits
- Coulomb's Law
- Electric Field and Potential
- Currents
- Resistance and Resistivity
- Circuits with Power Sources and Resistors: Kirchoff's Rules
- Circuits with Capacitors: RC Circuits

Maxwell’s Second Law
- Magnetism
- Magnetic Field Effects

Maxwell’s Fourth Law
- Ampere's Law: Magnetic Fields Induced by a Current-Carrying Wire
- The Magnetic Field of other Current-Carrying Conductors

Maxwell’s Third Law
- Faraday's Law: Electric Fields Induced by a Magnetic Flux
- Lenz's Law

Laboratory and Exam Schedule
(Tentative, subject to change, with notice given in class)

<table>
<thead>
<tr>
<th>Date</th>
<th>Laboratory Assignment or Exam Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 4—7</td>
<td>Lab 1: Coffee Cooling Experiment</td>
</tr>
<tr>
<td>Jan 11—15</td>
<td>Lab 2: Specific Heat</td>
</tr>
<tr>
<td>Jan 18th</td>
<td>Holiday       Martin Luther King Jr. Day – Campus Closed</td>
</tr>
<tr>
<td>Jan 18—22</td>
<td>No Lab Meetings. Self-study</td>
</tr>
<tr>
<td>Jan 25—29</td>
<td>Problem Solving/Discussion</td>
</tr>
<tr>
<td>Feb 1—5</td>
<td>Lab 3: Latent Heat of Fusion</td>
</tr>
<tr>
<td>Feb 1st</td>
<td>First Exam: All of Thermodynamics</td>
</tr>
<tr>
<td>Feb 8—12</td>
<td>Lab 4: Voltage, Current, and Resistance in a DC Circuit</td>
</tr>
<tr>
<td>Feb 15—19</td>
<td>Lab 5: Resistances in Series and Parallel</td>
</tr>
<tr>
<td>Feb 22—26</td>
<td>Lab 6: Voltage vs Time across a Capacitor</td>
</tr>
<tr>
<td>Feb 29th</td>
<td>Second Exam: Electric Forces, Fields, Potential and Circuits</td>
</tr>
<tr>
<td>Feb 29—Mar 4</td>
<td>Lab 7: Experimental Determination of the Force on a Current-Carrying Conductor in an External Magnetic Field</td>
</tr>
<tr>
<td>Mar 7—11</td>
<td>Problem Solving/Discussion</td>
</tr>
<tr>
<td>Mar 14th</td>
<td>Last Class Meeting (Lecture + Review)</td>
</tr>
<tr>
<td>Mar 14th</td>
<td>No Lab Meeting</td>
</tr>
</tbody>
</table>

Third and Final Exam: Wednesday March 16, 2016 5:00 -7:30 PM

January 25, 2016 – Last Day to Withdraw from Classes without a "W" being recorded
Laboratories

You will be asked questions about the laboratory exercises on the quizzes and exams. The handouts related to the lab exercises will be posted on the website [http://www.csub.edu/~adzyubenko/Phys222](http://www.csub.edu/~adzyubenko/Phys222).

Study the handouts before the Lab, print them out and bring to class, this is your responsibility. The handouts should explain what you need to understand. In addition, we will go over the material repeatedly during the Lab exercises.

Quizzes

A number of in-class and take-home quizzes will be given. The exact dates and deadlines will be announced in class a few days in advance. The quizzes consist of a series of short answer/multiple choice questions, which will make sure that you keep up with the lecture and problem sets.

Exams

By far, the most important determinant of your grade is exam performance. The exams are heavily biased toward the homework problems but some conceptual questions will be asked, especially pertaining to the lab exercises. So, if you do your homework conscientiously and attend each class and lab session well prepared, you will perform well, gradewise.

Please bring one large blue scantron to each quiz and exam if otherwise is not specified.

Homework Problems

Problem solving is the key to mastering physics. In fact, if you master all of the questions and problems at the end of each chapter, you will do very well in the course. On regular basis, I will assign some representative problems. The WebAssign® online homework and grading system [http://www.webassign.net/](http://www.webassign.net/) will be used in this course.

You are requested to register and pay the registration fee at [http://www.webassign.net/user_support/student/](http://www.webassign.net/user_support/student/) The class keys are csub 3738 9223 and csub 0374 5533 for the Updated Technology Edition.

Further details and the assignments will be given later. Some but not most of these questions will be discussed in detail in problem solving sessions. I encourage you to be proactive in class discussions.

Grade Distribution

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Exams</td>
<td>60%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20%</td>
</tr>
<tr>
<td>Labs</td>
<td>10%</td>
</tr>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
</tbody>
</table>

About grade assignments. Ultimately, the final grade I assign to you is my judgment of your performance (and only your performance). Inevitably, this judgment contains some subjective component, regardless of how objective I try to be. At the end of the course I will discuss only the bookkeeping related to a person’s grade, but not my assignment of a letter grade. For example, if a student's final score is 79%, I will review at his/her request how I arrived at that number, but I WILL NOT argue with the student why I think that should be a letter grade as opposed to some other letter grade. I will be the judge – NOT THE STUDENT – of what 79% means in the context of the class. Also, any inquiries regarding grades must be made by email.

By staying in the class, the student agrees to the terms in this syllabus.