

# Physics 142 Course Information

## General Physics II – Electricity and Magnetism

**Fall 2011**

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- Office Hours:** Will be posted on blackboard as soon as finalized.
- Textbook:** *University Physics*, Volume 2 of 13<sup>th</sup> Edition, Young & Freedman
- Online Homework:** *Student Access Kit*, for Mastering Physics Online Course Material  
Course ID: **UICPHY142FALL11**
- Laboratory Text:** *Physics 142 Laboratory Instruction CD (Do not buy, will be handed out)*
- Disclaimer:** The terms of this syllabus are subject to change by announcements in class, on the course website (blackboard), or by email.

### **Introduction:**

Physics 142 is a calculus-based course focused primarily on electricity and magnetism. It is the second course in a sequence of three introductory “foundation” physics courses, where Physics 141 covers classical mechanics and Physics 244 covers modern physics.

### **The Text and Lectures:**

Reading the textbook is an essential part of the course. Students will benefit the most if they read ahead *before* coming to the lecture. Students are expected to take accurate notes during the lecture and to ask relevant questions. Each student is individually responsible for the material covered in the book as well as each lecture.

### **Homework:**

Homework is an essential part of the course, and the primary means by which you will discover if you understand the material. It is very important that you spend time working on understanding how to apply the “big ideas” of lecture to specific problems. Working in small groups is often a useful environment to tackle difficult problems. In case of difficulty, please contact the tutors, laboratory TA’s or instructors for help.

Weekly homework assignments will primarily performed online at the Mastering Physics web page ([www.masteringphysics.com](http://www.masteringphysics.com)). They will be “due” by the day and time listed. The online system will always “save your work” so you can easily work on the problems continuously throughout the week. Do NOT leave it all for the last minute. The maximum value of a particular homework starts at full credit if completed on (or before) the due date and decreases after the due date such that homework completed two or more days late will be worth only 20%. To access this web site, we believe you can also use your same account you set up in Physics 141, but be sure to, when you log in the first time, choose the new Mastering Physics Course ID of: **UICPHY142FALL11**. If you did not take Physics 141 recently at UIC, then you will have to purchase separately (either online or at the book store) a student access kit for Mastering Physics. They are also bundled basically “for free” with a new textbook purchase at the UIC bookstore.

In addition to the online homework, there might be additional homework assignments and/or in-class quizzes. Relevant details will be given in your lecture by your instructor.

### **Laboratory:**

Physics is at its heart an experimental science, and the laboratory component is an integral part of this course. Be sure you have also signed up for one lab (LAB) section in addition to your lecture (LCD). Completion of the full laboratory part of the course is a requirement for passing Physics 142. That is, all experiments *must* be completed to pass this course. If you miss a lab, you can only make it up during the allowed weeks and provided your TA is available. Time has been set aside in the schedule for this purpose. Your laboratory manual will come in a CD format that will be passed out before the labs start.

### **Examinations:**

There will be three written “closed book” examinations during the course of the semester. Common exams are given to all Physics 142 sections and a common grading system is applied. It is your responsibility to be available for all examinations. This is the most important requirement of this course. There will be **no** make-up exams given after the exams are over – **no exceptions**.

Students must bring to the exams a working calculator, and pens or pencils. Textbooks, cell phones, computers, or *any* forms of wireless communication are strictly prohibited in an exam. Giving or receiving aid in an examination is cause for dismissal from the University. Any other violation of academic honesty can have the same effect.

*It is your responsibility to be available for all examinations, to take the exams at the arranged time, and to insure your exam is turned in and collected by the instructor.*

### **Grades:**

Final scores are based on the following 5 items, with the percentage weighting as given:

Exam I	24%
Exam II	24%
Final Exam	27%
Lab Work	14%
Homework	11%

A single letter grade of A, B, C, D or F is assigned at the end of the semester according to the final score each student has earned. The grade of incomplete (I) is given *only* in special cases according to very strict criteria. Please note: September 2<sup>nd</sup> is the last day to complete late registration and October 28<sup>th</sup> is the last day to withdraw from a course and receive a grade of W on academic record.

### **Course Web Site:**

The course web site will be handled through the UIC blackboard system. The blackboard site will list important course information including practice exams, solutions and contact information. It will also be the primary source of up-to-date information for what is happening in the course.

Students with disabilities who require accommodations for access and participation in this course must be registered with the Office of Disability Services (ODS). Please contact ODS at 312/413-2103 (voice) or 312/413-0123 (TTY).

# Physics 142 Course Outline

## Fall 2011

Note: This schedule may change as the semester progresses.

Always refer to the course web site for the most up-to-date syllabus and course information.

Text: "University Physics", Volume 2 of 13<sup>th</sup> Edition, Young & Freedman

Homework: Mastering Physics Online Web Homework: [www.masteringphysics.com](http://www.masteringphysics.com)

Laboratory: Physics 142 Laboratory Instruction CD

Exam I\* - Wednesday, September 28, 6-8 PM; covering material from Chapters 21-25.

Exam II\* - Wednesday, November 2, 6-8 PM; covering material from Chapters 26-30.

Final\* - Finals week; cumulative, but predominately covering Chapters 31-33, 35, 36.

Week	Text	Topics	Homework Assignment(s)	Lab
1 Aug. 22	<b><u>Chapter 21</u></b> 21.1 to 21.7	<b><u>Electric Charge &amp; Field</u></b> Electric Charge, Induced Charge, Coulomb's Law, Electric Field and Forces, Electric Dipole	Intro to MasteringPhysics <i>and</i> Online Homework 1  <b>Due: Aug. 31</b>	<i>No Lab Scheduled</i>
2 Aug. 29	<b><u>Chapter 22</u></b> 22.1 to 22.5	<b><u>Gauss's Law</u></b> Charge and Electric Flux, Gauss's Law, Charges on Conductors	Online Homework 2  <b>Due: Sep. 7</b>	<i>Experiment 1 <u>Electricity</u> Electrostatics</i>
3 Sep. 5  <i>Sep. 5 is a holiday (no class)</i>	<b><u>Chapter 23</u></b> 23.1 to 23.5	<b><u>Electric Potential</u></b> Electric Potential Energy and Electric Potential, Calculating Electric Potential Potential Gradient	Online Homework 3  <b>Due: Sep. 14</b>	<i>No Lab Scheduled</i>
4 Sep. 12	<b><u>Chapter 24</u></b> 24.1 to 24.4	<b><u>Capacitance and Dielectrics</u></b> Capacitors and Capacitance, Capacitors in Series and Parallel, Dielectrics	Online Homework 4  <b>Due: Sep. 21</b>	<i>Experiment 2 <u>Electricity</u> Charged Particles in Electric Fields (Part 1)</i>
5 Sep. 19	<b><u>Chapter 25</u></b> 25.1 to 25.6	<b><u>Current, Resistance, and Electromotive Force</u></b> Electric Current, Resistance, Circuits, Energy, Power, Theory of Conduction	Online Homework 5  <b>(Not graded)</b>	<i>Experiment 3 <u>Electricity</u> Charged Particles in Electric Fields (Part 2)</i>

<b>6</b> Sep. 26	<b>Chapter 26</b> 26.1 to 26.5	<b>Direct Current Circuits</b> Resistors in Series and Parallel Kirchhoff's Rules, RC Circuits, Power Distribution Systems	Online Homework 6  <b>Due: Oct. 5</b>	<b>No Lab Scheduled</b>  <i>(Make-up labs may be scheduled)</i>
<b>Exam I</b> <b>Sep. 28</b> <b>6-8 PM</b>		<b>Exam I on Sep. 28</b>		
<b>7</b> Oct. 3	<b>Chapter 27</b> 27.1 to 27.9	<b>Magnetic Field and Magnetic Forces</b> The Magnetic Field, Motion of Charged Particles, Magnetic Force and Torque, DC Motor, Hall Effect	Online Homework 7  <b>Due: Oct. 12</b>	<b>Experiment 4</b> <b>Circuits</b> <b>DC Circuits</b>
<b>8</b> Oct. 10	<b>Chapter 28</b> 28.1 to 28.8	<b>Sources of Magnetic Field</b> Magnetic Field of a Moving Charge, The Biot-Savart Law, Ampere's Law Magnetic Materials	Online Homework 8  <b>Due: Oct. 19</b>	<b>Experiment 5</b> <b>Circuits</b> <b>RC Circuits</b>
<b>9</b> Oct. 17	<b>Chapter 29</b> 29.1 to 29.8	<b>Electromagnetic Induction</b> Induction, Faraday's Law, Lenz's Law, Motional EMF, Induced Electric Fields, Eddy Currents, Maxwell's Equations, Superconductivity	Online Homework 9  <b>Due: Oct. 26</b>	<b>Experiment 6</b> <b>Magnetism</b> <b>Biot-Savart Law</b>
<b>10</b> Oct. 24	<b>Chapter 30</b> 30.1 to 30.6	<b>Inductance</b> Mutual Inductance, Self-Inductance and Inductors, The RL and LC Circuits, The LRC Circuit	Online Homework 10  <b>Not graded</b>	<b>Experiment 7</b> <b>Magnetism</b> <b>Ampere's Law</b>
<b>11</b> Oct. 31	<b>Chapter 31</b> 31.1 to 31.6	<b>Alternating Current</b> Phasors and Alternating Currents, Resistance and Reactance, The LRC Circuit Intro to complex numbers (Pb 31.75) Power, Resonance and Transformers	Online Homework 11  <b>Due: Nov. 9</b>	<b>No Lab Scheduled</b>  <i>(Make-up labs may be scheduled)</i>
<b>Exam II</b> <b>Nov. 2</b> <b>6-8 PM</b>		<b>Exam II on Nov. 2</b>		
<b>12</b> Nov. 7	<b>Chapter 32</b> 32.1 to 32.5	<b>Electromagnetic (EM) Waves</b> Maxwell's Equations and EM Waves, Plane EM waves and the Speed of Light Sinusoidal EM Waves, Energy and Momentum, Standing EM Waves	Online Homework 12  <b>Due: Nov. 16</b>	<b>Experiment 8</b> <b>Magnetism</b> <b>Induction</b>

<b>13</b> Nov. 14	<b><u>Chapter 33</u></b> 33.1 33.7 33.2 to 33.6	<b><u>The Nature and Propagation of Light</u></b> The Nature of Light, Huygens's Principle, Reflection and Refraction, Dispersion Polarization, Scattering	Online Homework 13  <b>Due: Nov. 23</b>	<b><i>Experiment 9</i></b> <u>Circuits</u> <i>AC Circuits</i>
<b>14</b> Nov. 21  <i>Nov. 24-25 is a holiday (no class)</i>	<b><u>Chapter 35</u></b> 35.1 to 35.5	<b><u>Interference</u></b> Coherent Sources, Two-Source Interference of Light, Interference in Thin Films, The Michelson Interferometer	Online Homework 14	<b><i>No Lab Scheduled</i></b>
<b>15</b> Nov.28	<b><u>Chapter 36</u></b> 36.1 to 36.7	<b><u>Diffraction</u></b> Single Slit Diffraction, Intensity, The Diffraction Grating, X-Ray Diffraction, Resolving Power	Online Homework 14  <b>Due: Dec. 2</b>	<b><i>Experiment 10</i></b> <u>Waves</u> <i>Interference and Diffraction</i>

\*All exams are "closed book" and it is the student's responsibility to be present at the scheduled time. Textbooks, cell phones, symbolic calculators or any other forms of wireless communication are strictly prohibited in an exam. Giving or receiving aid in an examination is cause for dismissal from the University. Any other violation of academic honesty can have the same effect.

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