Physics 231

Fundamentals of Physics: Electricity and Magnetism

Dr. Geoffrey Greene
Ayres 220b*
ggreene@utk.edu

General Information

Class Hours – 11:15 - 12:05 Mon/Wed

Office Hours – 12:30 - 13:30 Mon/Wed and by appointment

Laboratory sections – As scheduled


General Course Description

This course is intended to provide a foundation in electricity & magnetism as well as an introduction to DC & AC circuits. The course will closely follow the organization of the text and will cover most of chapters 21–31.

Prerequisites

The course and textbook presume a familiarity with calculus and calculus concepts. A background in mathematics up to the level of Math 141-142, or equivalent, is highly recommended and is probably necessary for success in the course.

Lecture Notes and Course Updates

Lectures notes and updates including definitive dates for hour exams will be posted at the class website:

This site is accessible by going to the main UTK website, and then following Academic Programs→Arts and Sciences→Academic Departments→Physics and Astronomy→Fall 2005 Courses→Physics 231 (Greene)

*Ayres 220b is not on the main corridor, enter through room 218*
THE SCHEDULE BELOW IS TENTATIVE

DATES FOR HOUR EXAMS ARE PROVISIONAL AND ARE SUBJECT TO CHANGES ANNOUNCED IN CLASS

<table>
<thead>
<tr>
<th>Week of</th>
<th>Reading/Lectures</th>
<th>Subject Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 August</td>
<td>Chapter 21 (§1-8)</td>
<td>Introduction, Electric Charges/Fields</td>
</tr>
<tr>
<td>28 August</td>
<td>Chapter 21 (continued)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chapter 22 (§1-4)</td>
<td>Electric Flux</td>
</tr>
<tr>
<td></td>
<td>Chapter 22 (§1-5)</td>
<td>Gauss’s Law</td>
</tr>
<tr>
<td>04 Sept</td>
<td>NO CLASS ON LABOR DAY</td>
<td></td>
</tr>
<tr>
<td>11 Sept</td>
<td>Chapter 23 (§1-4)</td>
<td>Electric Potential/Potential Energy</td>
</tr>
<tr>
<td>18 Sept</td>
<td>Chapter 24 (§1-3)</td>
<td>Capacitors</td>
</tr>
<tr>
<td>25 Sept</td>
<td>1st HOUR EXAM THIS WEEK</td>
<td>Capacitors and Energy</td>
</tr>
<tr>
<td></td>
<td>Chapter 25 (§1-5)</td>
<td>Current, EMF, Resistance</td>
</tr>
<tr>
<td>02 Oct</td>
<td>Chapter 25 (continued)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chapter 26 (§1-4)</td>
<td>DC Circuits</td>
</tr>
<tr>
<td>09 Oct</td>
<td>Chapter 26(continued)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chapter 26(continued)</td>
<td></td>
</tr>
<tr>
<td>16 Oct</td>
<td>2nd HOUR EXAM THIS WEEK</td>
<td>Magnetic Fields</td>
</tr>
<tr>
<td></td>
<td>Chapter 27(§1-8)</td>
<td></td>
</tr>
<tr>
<td>23 Oct</td>
<td>Chapter 27(continued)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chapter 27 continued</td>
<td></td>
</tr>
<tr>
<td>30 Oct</td>
<td>Chapter 28(§1-7)</td>
<td>Sources of Magnetic Fields</td>
</tr>
<tr>
<td>06 Nov</td>
<td>Chapter 28(continued)</td>
<td></td>
</tr>
<tr>
<td>13 Nov</td>
<td>3rd HOUR EXAM THIS WEEK</td>
<td>Electromagnetic Induction</td>
</tr>
<tr>
<td></td>
<td>Chapter 29</td>
<td></td>
</tr>
<tr>
<td>20 Nov</td>
<td>Chapter 30</td>
<td>Inductance</td>
</tr>
<tr>
<td>27 Nov</td>
<td>Chapter 31 (§1-3)</td>
<td>AC Circuits</td>
</tr>
<tr>
<td>04 Dec</td>
<td>Course Wrap and Summary</td>
<td></td>
</tr>
</tbody>
</table>
Academic Honesty

All work submitted by a student is expected to represent their own work. Students are expected to enter their own homework on the CAPA system without assistance from others. Students are expected to perform all work in conformance with the University policies regarding Academic Honesty.

Grading Policy

The semester Grade will be based on a Weighted Averages of hour tests grades, final exam grades, as well as laboratory scores, and homework scores.

Homework will comprise 15% of the final semester Grade

Homework sets will be assigned On-Line using the CAPA software system (http://homework.phys.utk.edu/). CAPA instructions are posted on the 231a web site. The problem sets will generally be available on-line at 12:00 noon each Monday and will be due at 8:00 am on the following Monday. Exceptions (for example at the Fall Break) will be noted in class) The first problem set will be assigned 29 August and will be due 2 weeks later on 12 September to allow a chance for students to familiarize themselves with the CAPA software. There will be ~12 problem sets. Due dates for problem sets are firm. In lieu of extensions, the two lowest scores on homework sets will be dropped from the average.

NO EXTENSIONS OR MAKE-UP PROBLEM SETS WILL BE GIVEN

Laboratory Scores will comprise 25% of the final semester Grade.

While laboratory work will be graded by each Lab Instructor independently, an effort will be made to insure a uniform grading policy between different laboratory sections. Laboratory make-ups are entirely at the lab instructor’s discretion and arrangements for such must be made with the lab instructor.

Hour Tests & Final Exam will comprise 60% of the final semester Grade

There will be three 1 Hour Tests and one Final Exam. The total Exam Grade will be a weighted average of the Hour Tests and the Final Exam with the Final being equivalent of three Hour Tests. In computing this average, a student’s lowest “effective” hour exam score will be dropped. If the lowest Grade is an Hour Exam, that Grade will be dropped and the total exam Weighted Average will be the average of the other two Hour Tests (each having a weight of 1/5) and the Final (with a weight of 3/5). If the lowest Grade is on the Final Exam, the total exam Grade will be the average of all three Hour Exams (each having a weight of 1/5) and the Final (with a weight of 2/5). If one Hour Test is missed, it will be considered to be the low score and will be dropped in the averaging. Because one test may be missed without direct penalty:

MAKE-UP HOUR TESTS WILL NOT BE GIVEN

IMPORTANT NOTE: Questions on the Hour Tests and Final will generally NOT require only a purely numerical answers (like the homework). Hour Test and Final questions will generally be similar in character to example problems in the book example problems given in lectures. Hour exams will be closed book, but a list of useful equations will be provided.

If, for any reason, there is a concern about a grade given on an exam or exam question, an appeal will be entertained if it is raised no later than one week after the date on which the graded exams are made available for return to the class. After this “appeal period” of one week, exam grades will be considered final and will not be altered.
Details of Grading Policy

- All Grades (Exams, Homework, Labs) will be converted to a letter Grade (A+, A, A-, B+, ....)

- A number will be assigned to each letter Grade as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>4.33</td>
</tr>
<tr>
<td>A</td>
<td>4.00</td>
</tr>
<tr>
<td>A-</td>
<td>3.67</td>
</tr>
<tr>
<td>B+</td>
<td>3.33</td>
</tr>
<tr>
<td>B</td>
<td>3.00</td>
</tr>
<tr>
<td>B-</td>
<td>2.67</td>
</tr>
<tr>
<td>C+</td>
<td>2.33</td>
</tr>
<tr>
<td>C</td>
<td>2.00</td>
</tr>
<tr>
<td>C-</td>
<td>1.67</td>
</tr>
<tr>
<td>D</td>
<td>1.00</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
</tr>
</tbody>
</table>

- Final Grade will be determined by weighted average
  With weights of (see previous discussion):
  - Homework  15%
  - Labs 25%
  - Exams 60%

- The semester letter Grade will be assigned based on the numerical value of the weighted average based on the following:

<table>
<thead>
<tr>
<th>Weighted Average</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 3.50</td>
<td>A</td>
</tr>
<tr>
<td>3.33 ≤ Weighted Average &lt; 3.50</td>
<td>B+</td>
</tr>
<tr>
<td>2.50 ≤ Weighted Average &lt; 3.33</td>
<td>B</td>
</tr>
<tr>
<td>2.33 ≤ Weighted Average &lt; 2.50</td>
<td>C+</td>
</tr>
<tr>
<td>1.50 ≤ Weighted Average &lt; 2.33</td>
<td>C</td>
</tr>
<tr>
<td>1.00 ≤ Weighted Average &lt; 1.50</td>
<td>D</td>
</tr>
<tr>
<td>Weighted Average &lt; 1.00</td>
<td>F</td>
</tr>
</tbody>
</table>