Electricity and Magnetism I (Physics 4100)

Monday, Wednesday and Friday 11:00—11:50 PM, 102 Physics Bldg.
Course date: Wednesday, January 23 through Friday, May 10, 2019

INSTRUCTOR
Dr. Guang Bian
E-mail: biang@missouri.edu
Tel: 573-882-7892
Office Location: 312 Physics Bldg.
Office Hours: Monday, 3:30-4:30 PM

Teaching Assistant
Pratik Sahu
Email: pks3md@mail.missouri.edu

COURSE DESCRIPTION
First part of a two-semester course on the basic concepts of classical electrodynamics.

Course Topics:
1. Review of basic math tools: vector algebra, differential and integral calculus and curvilinear coordinates
2. Basic concepts in electrostatics: electric field and electric potential
3. Techniques for solving electrostatics problems: Laplace's equation, method of images
4. Electric fields in matter: polarization and dielectrics
5. Magnetostatics: magnetic fields and vector potentials
7. Electrodynamics: Maxwell's equations - derivation and interpretation

COURSE LEARNING GOALS

1. Learn the necessary mathematical background (vector analysis, differential and integral calculus) from a physicist's practical point of view.
2. Introduce the concepts of fields and potentials, and learn techniques to solve problems in electro- and magnetostatics in vacuum and in matter.
3. Derive Maxwell's equations, the fundamental equations for electrodynamics, and come to a deep understanding of their meaning.

TEXTBOOKS AND COURSE MATERIAL

Introduction to Electrodynamics by David J. Griffiths (Cambridge University Press, fourth edition)

Additional Reference:

Classical Electrodynamics by J. D. Jackson

Electromagnetic Fields and interactions by R. Becker

COURSE POLICIES

Students are expected to attend all lectures. It is the experience of this and many other instructors that students who attend class regularly do better in the course.

ASSIGNMENTS

There will be 10 homework assignments during the semester, counting 40 points each. Homework assignments will be collected in class on their due date. Solutions will be posted on the Website. After that, no late homework will be accepted.

EXAMS

There will be regular midterm and final exams counting 150 points each.
<table>
<thead>
<tr>
<th>Percentage</th>
<th>Points (700 total)</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 40%</td>
<td>0 - 279</td>
<td>F</td>
</tr>
<tr>
<td>40% - 55%</td>
<td>280 - 384</td>
<td>D</td>
</tr>
<tr>
<td>55% - 70%</td>
<td>385 - 489</td>
<td>C</td>
</tr>
<tr>
<td>70% - 85%</td>
<td>490 - 594</td>
<td>B</td>
</tr>
<tr>
<td>85% - 100%</td>
<td>595 - 700</td>
<td>A</td>
</tr>
</tbody>
</table>

Please note that the range of points for each letter grade includes plus and minus grades.