

## Physics 110B Syllabus

### Electricity and Magnetism

(Physics 110B: CRN 55501)

**Description:** Lecture—3 hours; extensive problem solving. Prerequisite: courses 9B, 9C, 9D and Mathematics 21D, 22A, and 22B passed with grade C– or better, or consent of department; prerequisite for 110B is courses 110A and 104A passed with a grade of C– or better or consent of department; Theory of electrostatics, electromagnetism, Maxwell's equations, electromagnetic waves.

**Instructor:** Professor Nicholas Curro

[curro@physics.ucdavis.edu](mailto:curro@physics.ucdavis.edu)

Office - Room 201; Office Hours on Thursdays 11-12 pm in Roessler 158 or by appointment

**Lecture Time:** MWF 10:00-10:50am, Winter Quarter 2012

**Location:** Roessler 55

**Textbook(s):** [Introduction to Electrodynamics](#), 4th ed. by David Griffiths

**Website:** All materials and latest information will be available on Smartsite, including a discussion board. Please take advantage of these resources!

**Graders:** [Gabe Herczeg](#) **Office Hours:** Wed 3-4pm **Location:** 410 Physics

[Ching Lin](#) **Office Hours:** Fri 1-2pm **Location:** 221 Physics

[Rion Graham](#) **Office Hours** Mon. 4-5pm **Location:** 225 Physics

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**Homework (15%):** There will be nine homework assignments. Each assignment will be approximately 5-10 problems from the textbook, and will be due in class on Mondays.

**Quizzes (25%):** There will be eight weekly quizzes on Mondays for the first 15 minutes of lecture.

**Exams (One Midterm 25%, and Final Exam 35%):** Basic scientific calculators are required and integrals and constants will be provided, but no physics formula will be given. The midterms will be given during a class period. The final exam is 2 hours and is comprehensive, covering all of the material in the course. No makeups are available on the midterms except for an excused absence. The final exam will take place on Saturday June 8 from 1:00 pm -3:00 pm in Roessler 55. Cheating will not be tolerated in any form, and the matter will be submitted to the Student Judicial Affairs. Regrades on the midterm will be allowed, but will cost you 10 points except in extreme cases of misgrading. Regrades must be requested within one week of getting the graded exams back.

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**Lecture Etiquette:** Turn your cell phones off. No texting/phone calls/gaming will be tolerated, or any private conversations. Lecture time is a precious resource that you and your colleagues are paying for, so please respect one another!

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**Podcasting:** The lectures will be recorded and will be available as Podcasts on the Smartsite. This is not intended to be a substitute for attending lecture, but hopefully will complement your notes as another study material.

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**Course Schedule:**

<b>Dates</b>	<b>Subject Material</b>	<b>reading assignment</b>
Monday, April 01, 2013	Lorentz Force	<i>Section 5.1</i>
Wednesday, April 03, 2013	Biot-Savart Law	<i>Section 5.2</i>
Friday, April 05, 2013	<b>No Class</b>	
Monday, April 08, 2013	Divergence and Curl of B	<i>Section 5.3.1-2</i>
Wednesday, April 10, 2013	Amperes Law	<i>Section 5.3.3-4</i>
Friday, April 12, 2013	Vector Potential	<i>Section 5.4.1-2</i>
Monday, April 15, 2013	Multipole Expansion of Vector Potential	<i>Section 5.4.3</i>
Wednesday, April 17, 2013	Magnetization	<i>Section 6.1.1-2</i>
Friday, April 19, 2013	Paramagnetism and Ferromagnetism	<i>Section 6.1.3-4</i>
Monday, April 22, 2013	Bound Currents	<i>Section 6.2.1</i>
Wednesday, April 24, 2013	Field of Magnetized Objects	<i>Section 6.2.2-3</i>
Friday, April 26, 2013	The Auxiliary Field H	<i>Section 6.3</i>
Monday, April 29, 2013	Linear and Nonlinear Media	<i>Section 6.4</i>
Wednesday, May 01, 2013	<b>Midterm</b>	
Friday, May 03, 2013	Electromotive force and Ohm Law	<i>Section 7.1</i>
Monday, May 06, 2013	Motional EMF	<i>Section 7.2.3</i>
Wednesday, May 08, 2013	Faraday's Law	<i>Section 7.2.1-2</i>
Friday, May 10, 2013	Electromagnetic Induction	<i>Section 7.2</i>
Monday, May 13, 2013	Maxwell's equations	<i>Section 7.3</i>
Wednesday, May 15, 2013	Poynting's Theorem	<i>Section 8.1</i>
Friday, May 17, 2013	Maxwell Stress Tensor	<i>Section 8.2</i>
Monday, May 20, 2013	Energy and Momentum in Electrodynamics	<i>Section 8.3</i>
Wednesday, May 22, 2013	The Wave Equation in 1D	<i>Section 9.1</i>
Friday, May 24, 2013	Reflection and Transmission	<i>Section 9.2</i>
<b>Monday, May 27, 2013</b>	<b>No Class - Memorial Day</b>	
Wednesday, May 29, 2013	EM Waves in Nonconducting Media	<i>Section 9.3</i>
Friday, May 31, 2013	<i>EM Wave in Conductors</i>	<i>Section 9.4</i>
Monday, June 03, 2013	<i>Wave Guides</i>	<i>Section 9.5.1-2</i>
Wednesday, June 05, 2013	Coaxial Transmission Lines	<i>Section 9.5.3</i>
<b>Saturday, June 08, 2013</b>	<b>Final Exam Roessler 55 1:00-3:00pm</b>	