

Physics 387K: Electromagnetic Theory FALL 2016

Unique Number: 56405
Meeting Time and Place: MWF 11-12⁰⁰ noon, RLM 7.124
Textbook: Jackson, *Classical Electrodynamics*, (3rd Edition)
Instructor: Michael Downer
Office Hours: MWF 12-1pm
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TA/grader: TBA
TA/grader office hours: TBA
Course web page: <http://canvas.utexas.edu/> (Canvas)

OTHER USEFUL TEXTS (not required)

Griffiths, *Introduction to Electrodynamics*, 3rd ed. You should be familiar with the material in Chapters 1-7.
Arfken, *Mathematical Methods for Physicists*
Brau, *Modern Problems in Classical Electrodynamics* (Oxford U. Press 2004)
Landau, Lifschitz, and Pitaevskii, *Electrodynamics of Continuous Media*, 2nd ed.
Born and Wolf, *Principles of Optics*, 7th ed.

Copies of these books are on reserve in the PMA library.

COURSE OUTLINE

Review of Electrostatics and Magnetostatics. Chapters 1-5
Maxwell's Equations and Conservation Laws. Chapter 6
Propagation of Electromagnetic Radiation. Chapter 7
Waveguides and Resonant Cavities. Chapter 8
Radiating Systems and Multipole fields. Chapter 9
Scattering and Diffraction. Chapter 10

GRADING

Homework I 15% (See back for homework assignments)
Homework II +15% (See back for explanation)
Midterm #1 15% (October 16, in class, covering chapters 6,7)
Midterm #2 20% (November 25, format TBA, covering chapters 8,9)
Final Exam* 50% (check official University listings for time and place)

University regulations concerning exams, grading and other course procedures are contained in the *General Information Catalog*, available in the Registrars Office and Online.

* Your final exam grade will over-ride any midterm scores that are lower.

Physics 387K tentative course schedule

<u>Textbook Chapters</u>	<u>Class Dates</u>	<u>Homework Due</u>
Chapters 1-5 highlights: Mathematical Tools of Electrodynamics, Review of Electrostatics	Aug 24, 26 Aug 29, 13, Sept 2 Sept. (5)*, 7** , 9	HW#1: Sept 7 HW#2: Sept 12
<i>* Labor Day Holiday no class meeting, but I will provide a written lecture. 12th class day: last day to add a course, last day to drop for possible refund</i>		September 9
Chapter 6: "Maxwell Equations, Macroscopic Electromagnetism, Conservation Laws"	Sept 12,14, 16 Sept 19, 21, 23	HW#3: Sept 19 HW#4: Sept 26
Chapter 7: "Plane Electromagnetic Waves and Wave Propagation"	Sept 26, 28, 30 Oct 3, 5, 7 Oct 10, 12	HW#5: Oct 3 HW#6: Oct 10
Chapter 8: "Waveguides,	Oct 14	
MID-TERM #1: Chapters 6 - 7	Monday, October 17** (in class)	
... Resonant Cavities, and Optical Fibers"	Oct. 19** , 21** Oct. 24, 26, 28	HW#7: Oct. 24 HW#8: Oct. 31
<i>Last day to change to or from CR/NC</i>	November 1	
Chapter 9: "Radiating Systems, Multipole Fields and Radiation"	Oct. 31, Nov. 2, 4 Nov. 7, 9, 11 Nov. 14	HW#9: Nov. 7 HW#10: Nov. 14
Chapter 10: "Scattering ...	Nov. 16, 18	
MID-TERM #2: Chapters 8-9	Monday, November 21 (take-home)	
THANKSGIVING BREAK		
... and Diffraction"	Nov. 28, 30, Dec. 2 Dec. 5	HW#11: Dec 5
<i>Last day to drop a class, with required approvals</i>	December 5	
FINAL: Comprehensive	Friday, December 9, 2-5 pm	

Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 512-471-6259, <http://www.utexas.edu/diversity/ddce/ssd/>

****** Prof. Downer will be out of town for these three classes. On Sept. 7, and Oct. 19 and 21, in lieu of a class meeting, you will read a written version of these lectures, and submit answers to a few self-test questions.

Most homeworks will consist of Parts I and II. Part I is basic and required. It will count 15% of your grade. Part II is optional, but recommended, and can count up to an additional 15% bonus credit toward your grade. Part II problems should be submitted on a separate paper from the basic assignment, and will be due one week after the corresponding basic assignment.

Completed homework may be submitted either in Monday's class, or to the TA later in the day. Two late assignments per semester will be accepted up to Wednesday's class the same week without penalty. Additional late assignments will be assessed a 20% late penalty, unless specifically authorized by Prof. Downer. Solutions will be posted in the PMA library reserve folder after Wednesday's class.

Bonus credit & over-rides will be applied after initial grade distributions and cut-offs have been established using the basic criteria. In this way eligible students benefit from them without penalizing other students.