

CLASSICAL ELECTRODYNAMICS I

Physics 6/75203

FALL 2017

INSTRUCTOR:

Dr. Mark Manley manley@kent.edu
217 Smith <http://www.kent.edu/physics/profile/d-mark-manley>
330-672-2407

CLASS HOURS: 1:10 - 2:00 M W F, 202 Smith Hall

OFFICE HOURS: 3:30 - 4:30 M
 3:00 - 4:00 T
 2:30 - 3:30 W
 11:00 - 12:00 R
 (or by appointment)

TEXT: *Classical Electrodynamics*, third edition, by John David Jackson (Wiley).

PREREQUISITE: Special Approval. Students who do not have the proper prerequisites risk being deregistered from the class.

STUDENT LEARNING OUTCOMES: Upon successful completion of this course, students will be able to:

- Solve boundary-value problems in electrostatics in a variety of coordinate systems.
- Demonstrate a basic understanding of Green Functions and their applications
- Solve problems using special functions, such as Bessel functions and Legendre polynomials.
- Have a basic understanding of magneto-statics.

GRADE DETERMINATION:	Homework	20%
	Exam 1	25%
	Exam 2	25%
	Final Exam	30%

HOMEWORK: Problems will be assigned in class. Homework assignments *must* be handed in on time.

EXAMS: Each of the two midterm exams will cover only those chapters of the text that were covered in class since the previous exam. The final exam will be comprehensive.

COVERAGE: As indicated on the tentative course outline.

MAKEUP CLASSES: I anticipate being away occasionally because of research commitments. Make-up classes will be scheduled as needed.

CHEATING AND PLAGIARISM:

University policy 3342-3-01.8 deals with the problem of academic dishonesty, cheating, and plagiarism. None of these will be tolerated in this class. The sanctions provided in this policy will be used to deal with any violations. If you have any questions, please read the policy at http://www.kent.edu/policyreg/-policydetails.cfm?customel_datapageid_1976529=2037779 and/or ask.

STUDENTS WITH DISABILITIES:

University policy 3342-3-01.3 requires that students with disabilities be provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact the instructor at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through Student Accessibility Services (contact 330-672-3391 or visit www.kent.edu/sas for more information on registration procedures).

REGISTRATION REQUIREMENT:

The official registration deadline for this course is September 3, 2017.

University policy requires all students to be officially registered in each class they are attending. Students who are not officially registered for a course by published deadlines should not be attending classes and will not receive credit or a grade for the course. Each student must confirm enrollment by checking his/her class schedule (using Student Tools in FlashFast) prior to the deadline indicated. Registration errors must be corrected prior to the deadline.

The course withdrawal deadline is November 5, 2017.

TENTATIVE COURSE OUTLINE:

Week	Date	Day	Tentative Schedule
1	Aug 28	M	Ch. 1—Coulomb's Law, Gauss' Law, the Electric Field
	Aug 30	W	Ch. 1—Divergence Theorem and Stoke's Theorem
	Sep 1	F	Ch. 1—Poisson and Laplace Equations; Green's Theorem
2	Sep 4	M	Labor Day—No Classes
	Sep 6	W	Ch. 1—Continued
	Sep 8	F	Ch. 1—Continued
3	Sep 11	M	Ch. 1—Potential Energy, Energy Density, Capacitance
	Sep 13	W	Ch. 2—Boundary-Value Prob.; Method of Images
	Sep 15	F	Ch. 2—Orthogonal Functions and Fourier Expansions
4	Sep 18	M	Ch. 2—Separation of Variables
	Sep 20	W	Ch. 3—Laplace's Eq. in Spher. Coord.; Legendre Poly.
	Sep 22	F	Ch. 3—Boundary-Value Prob. with Azimuthal Symmetry

TENTATIVE COURSE OUTLINE (Continued):

Week	Date	Day	Tentative Schedule
5	Sep 25	M	Ch. 3—Spherical Harmonics and Assoc. Legendre Func.
	Sep 27	W	Ch. 3—Laplace's Eq. in Cyl. Coord.; Bessel Func.
	Sep 29	F	Ch. 3—Green Function Expansions
6	Oct 2	M	Ch. 3—Continued
	Oct 4	W	Ch. 3—Continued
	Oct 6	F	Ch. 4—Multipole Expansions
7	Oct 9	M	Ch. 4—Electric Polarization and Displacement
	Oct 11	W	Ch. 4—Boundary-Value Problems with Dielectrics
	Oct 13	F	Exam 1 (Chapters 1 and 2)
8	Oct 16	M	Ch. 4—Molecular Polarizability; Elect. Susceptibility
	Oct 18	W	Ch. 4—Continued
	Oct 20	F	Ch. 4—Continued
9	Oct 23	M	Ch. 4—Continued
	Oct 25	W	Ch. 4—Continued
	Oct 27	F	Ch. 5—Magnetostatics; Biot and Savart Law
10	Oct 30	M	Ch. 5—Continued
	Nov 1	W	Ch. 5—Continued
	Nov 3	F	Ch. 5—Gauss' Law for Magnetism and Ampère's Law
11	Nov 6	M	Ch. 5—The Vector Potential
	Nov 8	W	Ch. 5—Current Distributions; Magnetic Moments
	Nov 10	F	Veterans Day—No Classes

TENTATIVE COURSE OUTLINE (Continued):

Week	Date	Day	Tentative Schedule
12	Nov 13	M	Ch. 5—Continued
	Nov 15	W	Ch. 5—Magnetic Field; Boundary-Value Problems
	Nov 17	F	Exam 2 (Chapters 3 and 4)
13	Nov 20	M	Ch. 5—Continued
	Nov 22	W	Thanksgiving Recess—No Classes
	Nov 24	F	Thanksgiving Recess—No Classes
14	Nov 27	M	Catch-up Day
	Nov 29	W	Catch-up Day
	Dec 1	F	Catch-up Day
15	Dec 4	M	Catch-up Day
	Dec 6	W	Catch-up Day
	Dec 8	F	Catch-up Day
17	Dec 13	W	Final Exam (10:15–12:30 p.m.)