CLASSICAL ELECTRODYNAMICS I
Physics 6/75203
SPRING 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, 111 Smith Hall

OFFICE HOURS: 3:30 - 4:30 M W
3:00 - 4:00 T
11:10 - 12:00 R
(or by appointment)

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

PREREQUISITE: Special Approval. Students who do 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 January 22, 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 March 26, 2017.

TENTATIVE COURSE OUTLINE:

Week	Date	Day	Tentative Schedule
1	Jan 16	M	MLK Jr. Day—No Class
	Jan 18	W	Ch. 1—Coulomb's Law, Gauss' Law, the Electric Field
	Jan 20	F	Ch. 1—Divergence Theorem and Stoke's Theorem
2	Jan 23	M	Ch. 1—Poisson and Laplace Equations; Green's Theorem
	Jan 25	W	Ch. 1—Continued
	Jan 27	F	Ch. 1—Continued
3	Jan 30	M	Ch. 1—Potential Energy, Energy Density, Capacitance
	Feb 1	W	Ch. 2—Boundary-Value Prob.; Method of Images
	Feb 3	F	Ch. 2—Orthogonal Functions and Fourier Expansions
4	Feb 6	M	Ch. 2—Separation of Variables
	Feb 8	W	Ch. 3—Laplace's Eq. in Spher. Coord.; Legendre Poly.
	Feb 10	F	Ch. 3—Boundary-Value Prob. with Azimuthal Symmetry

TENTATIVE COURSE OUTLINE (Continued):

Week	Date	Day	Tentative Schedule
5	Feb 13	M	Ch. 3—Spherical Harmonics and Assoc. Legendre Func.
	Feb 15	W	Ch. 3—Laplace's Eq. in Cyl. Coord.; Bessel Func.
	Feb 17	F	Ch. 3—Green Function Expansions
6	Feb 20	M	Ch. 4—Multipole Expansions
	Feb 22	W	Ch. 4—Electric Polarization and Displacement
	Feb 24	F	Ch. 4—Boundary-Value Problems with Dielectrics
7	Feb 27	M	Ch. 4—Molecular Polarizability; Elect. Susceptibility
	Mar 1	W	Ch. 4—Continued
	Mar 3	F	Exam 1 (Chapters 1 and 2)
8	Mar 6	M	Ch. 5—Magnetostatics; Biot and Savart Law
	Mar 8	W	Ch. 5—Continued
	Mar 10	F	Ch. 5—Continued
9	Mar 13	M	Ch. 5—Gauss' Law for Magnetism and Ampère's Law
	Mar 15	W	Ch. 5—The Vector Potential
	Mar 17	F	Ch. 5—Current Distributions; Magnetic Moments
10	Mar 20	M	Ch. 5—Continued
	Mar 22	W	Ch. 5—Magnetic Field; Boundary-Value Problems
	Mar 24	F	Ch. 6—Faraday's Law of Induction
11	Mar 27	M	Spring Break—No Class
	Mar 29	W	Spring Break—No Class
	Mar 31	F	Spring Break—No Class

TENTATIVE COURSE OUTLINE (Continued):

Week	Date	Day	Tentative Schedule
12	Apr 3	M	Ch. 6—Energy in the Magnetic Field
	Apr 5	W	Ch. 6—The Maxwell Equations
	Apr 7	F	Exam 2 (Chapters 3 and 4)
13	Apr 10	M	Ch. 6—Gauge Invariance of Electromagnetism
	Apr 12	W	Ch. 6—Green Functions for the Wave Equation
	Apr 14	F	Ch. 6—Poynting's Theorem
14	Apr 17	M	Ch. 6—Continued
	Apr 19	W	Ch. 6—Continued
	Apr 21	F	Ch. 6—Continued
15	Apr 24	M	Ch. 6—The Duality Transformation
	Apr 26	W	Catch-up Day
	Apr 28	F	Catch-up Day
16	May 1	M	Catch-up Day
	May 3	W	Catch-up Day
	May 5	F	Catch-up Day
17	May 12	F	Final Exam (10:15–12:30 p.m.)