



Department of Physics
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August 27, 2018
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Physics 422- Electricity and Magnetism II, Fall 2018

Instructor: Yong W. Kim (Office: Rm LL403)

email: ywk0; Phone: #8-3922

Place: Lewis Lab Rm 311

Time: 11:10AM-12:00 Noon on Monday, Wednesday and Friday

Topical Content of the Course

Maxwell's Equations

Review of Electrostatics and Magnetostatics (Chapter 1-5)

Wave Equation and Gauge Transformation

Macroscopic Fields in Materials; Energy and Momentum

Reflection and Refraction

Wave Guides and Resonant Cavities

Radiating Systems, Antennas

Scattering and Diffraction

Relativity

Collision between Charged Particles

Radiation by Moving Charges

Recommended Texts

J. D. Jackson, Classical Electrodynamics, 3rd ed. (John Wiley & Sons, 1999)

Other References:

R.G. Brown, Lecture Notes-Classical Electrodynamics Part II
(Duke U.)

David Griffiths, Introduction to Electrodynamics, 3rd ed. (1999)

Assignments and Examinations

Weekly assignments, each due a week from the date of assignment

Mid-semester exam: Hour Exam (75 min)

One term paper (equivalent to Hour Exam)

Final examination (3 hours)

Grading: Homework, 20%; Hour Exam, 20%; and Term Paper, 20%;
Final Exam, 40%

Final expected competencies at the end of the course:

- Students have gained fundamental understanding of the Maxwell equations as pertain to time-dependent motion of electric charges and accompanying electromagnetic radiation;
- Have gained proficiency with applying Maxwell's equations to a distribution of electric charges and associated electromagnetic fields for given geometry of material media and boundaries between them;
- Have experienced working with the mathematical techniques for solving the Maxwell equations;
- Have gained understanding of electromagnetic wave phenomena, including the interaction between charged particles and wave-particle interactions; and
- Have learned how to treat the motions of charged particles when they become relativistic.

Accommodations for Students with Disabilities: *If you have a disability for which you may be requesting accommodations, please contact your instructor and the Office of Academic Support Services, Williams Hall, Suite 301 (610-758-4152) early in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.*

Academic Integrity

Please read the sample vignettes of how University's policy on academic integrity applies in different circumstances at the website: http://www.lehigh.edu/lts/official/Academic_Integrity_Vignettes.pdf

*Lehigh University endorses **The Principles of Our Equitable Community***

[http://www.lehigh.edu/~inprv/initiatives/PrinciplesEquity_Sheet_v2_032212.pdf]. We expect each member of this class to acknowledge and practice these Principles. Respect for each other and for differing viewpoints is a vital component of the learning environment in and outside the classroom.