ENG SC 456: Electromagnetics Systems II
Spring 2012

Lecturer: Professor Min-Chang Lee
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Office hours: Monday & Wednesday, 3-4 PM

Lectures: Monday & Wednesday, 12-2 PM
in PHO Rm. 201


Exams: Mid-term examination is scheduled on Wednesday, March 7 in
PHO Rm. 201. Project report is due on Wednesday, April 25.
Final exam will be scheduled and announced later.

Homework: Homework assignment will be issued on Monday or Wednesday
in the class. It is due on the same day in following week in class.
NO LATE HOMEWORK WILL BE ACCEPTED.

Grading Policy: (1) Homework: 20%,
(2) Mid-term exam: 25%,
(3) Project report 25%,
(4) Final exam: 30%.

Course Schedule

1. Jan. 18 Features of EC456 (e.g., 2.4. Lorentz force, 5.1. Seafarer)
3 Jan. 25 9.2. Electrostatic fields; 9.3. Gauss’ law & applications
4. Jan. 30 9.4. Calculation of potential from E field
5. Feb. 1 10.1. Electric force
6. Feb. 6 10.2. Work and energy
7. Feb. 8 10.3. Capacitance
10. Feb. 22 Method of separation of variables
11. Feb. 27 12.1., 12.2., Direct currents
            (Review for midterm exam)
14. Mar. 7  Midterm exam
15. Mar. 19 13.3. Stored magnetic energy and inductance
18. Mar. 28 15.1. Quasistatic approximation
19. Apr.  2 15.2. Circuit theory and electrostatics
20. Apr.  4 16.1. Magnetoquasistatic fields
21. Apr.  9 16.2. Transformers, generators, motors
22. Apr. 11 Special topics (8.1. Rayleigh scattering)
23. Apr. 16 8.2. Fourier optics and holography
24. Apr. 18 8.3. Gaussian beam
25. Apr. 23 8.4. Doppler effect
26. Apr. 25 8.5. Plane waves in anisotropic media
            (Project report due)
27. May  1  Review for final exam
28. TBA  Final exam.
A list of potential projects:

1. Plasmas (2.4. Lorentz Force)
2. Isotope separation (13.2 Magnetic force & torque)
3. Seafarer (5.1. Parallel waveguide)
4. Ion Thruster (10.2. Electrostatic propulsion)
5. Electrostatic filter (10.1. Electrostatic precipitation)
6. Doppler radar for remote sensing of earth terrain (8.4. Doppler effect)
8. Ink-jet printer (10.2. Work & energy)
9. Cathode ray tube (CRT) (10.2. Work & energy)
10. Geometric shapes of DNA molecules (10.3. Electrophoresis)