EEL 4410 – Fields and Waves

Summer 2018

Professor: Dr. Grover Larkins
EAS 3830
348-2807

Office Hours: After Class Tuesday and Thursday

Textbooks: Fundamentals of Applied Electromagnetics by Ulaby and Ravaioli

Course Objective: The objective of this course is to provide basic and intermediate knowledge and skills in Electromagnetic Fields and Waves.

Make-Up Policy: Only under the following conditions will a make-up mid-term examination be given. In the event of a medical emergency a note from a certified physician will be required and the treatment will be verified. In the event of a traffic accident, a copy of the police report is required. Traffic violations, arrests etc. are NOT grounds for a make-up exam. Should you need to go out of town on business the Mid-term will be given **BEFORE** the regularly scheduled examination, **not AFTER** it!

Grading Policy: The course grade will be based on the following:
Homework is +0, -25% of your grade.
3 Exams, each 33% of the final grade
Extra Credit 3% for successful completion of Amateur Radio License

Note: There is NO curve. Placement of letter grade cut-offs are at the Professor's discretion but generally follow accepted practice of A's 90%+, B's 80%+, C's 70%+, D's 60%+ and F's below 60%

EEL 4410 Course Outline

Lecture	Topics
1	Introduction. Units, vector analysis, point charges, Coulomb's law, Electric Field.
2	Superposition, potential, field mapping, charge distributions, E field as gradient of potential, electric flux, Gauss's law and capacitors/capacitance.
3	Charged particles in motion in electric fields and dielectrics in static fields, polarization charge density.
4	Dielectrics in static fields cont'd and electric current, boundary conditions, Ohm's law. Divergence of current density, Laplace's equations.
5	**Exam I,** introduction to magnetic fields.
6	Force on current carrying wire, Biot-Savart Law, Magnetic flux and Magnetic Flux density. Ampere's law, Magnetostatic potential, curl equations and vector potential.
7	Charged Particles moving in magnetic fields, ferromagnetism, ferromagnetic materials in static magnetic fields.
8	Faraday's law, induction, Stokes's theorem, self inductance, mutual inductance and ac behavior of ferromagnetic materials.
9	**Exam II**, derivation of Maxwell's equations, wave equation and transmission lines.
10	Transmission lines, polarization, reflection, diffraction, refraction and physical optics.
11	Dispersion, loss, scattering.
12	Review and **Exam III**.