



## INEL 4151- Electromagnetic Theory I

**Credit-Hours: 3, Pre-requisites:** Calculus III, **Co-requisites:** none

Introduction to Electrostatic and Magnetism including Static and time varying electric and magnetic fields; dielectric, magnetic and conducting materials; capacitance, inductance and conductivity; magnetic circuits; dielectric and magnetic hysteresis; Maxwell's equations and transmission line theory.

**Text:** *Elements of Electromagnetics*, by M. Sadiku, Oxford, University Press

Professor: Dr. Sandra L. Cruz-Pol, [*Check my webpage* [www.ece.uprm.edu/~pol](http://www.ece.uprm.edu/~pol)]

Office: Stefani S-224, **Hours: KJ 1:15pm – 2:00 pm**, [CruzPol@ece.uprm.edu](mailto:CruzPol@ece.uprm.edu)

**EVALUATION:** 20% quizzes & homeworks, 3 partial exams @ 60%, final 20% = 100%

**Partial Exams:** All during class period. **Sept 11, Oct11, Nov 27.** During class period

### RULES:

- Students are not allowed to leave the classroom during class except in exceptional circumstances.
- **Exam attendance** is required unless you have a medical excuse or equivalent documented emergency.
- **Class attendance** is also required. You are allowed one unexcused absence with no questions asked; beyond this number your grade will be reduced.
- **Dishonest behavior**, as commonly understood, which includes exam cheating or plagiarism, will result in at least a zero for the exam or project, and for an aggravated incident, failure in the course and initiation of University disciplinary action. In research, you expect to build on others' work, but it should be very clear what is yours and what is theirs, clearly referenced or acknowledged.
- If there is a conflict with my Office Hours => schedule by appointment.
- No beepers and/or cellular phones are allowed during exams, and their use during classes should be limited to emergencies. Leave the room if the need to use it arrives.
- No baseball caps allowed during quizzes or exams.
- No "special" projects will be given to anyone to improve grades or for any other reason.
- **Disabilities:** Reasonable accommodations will be coordinated in accordance with the needs of the student.
- Read your email frequently: I communicate announcements like quiz cancellation and changes by email.
- Standard grade curve is A:100-90, B:89-80, C:79-70, D:69-60, F:59 and below.

<i>COURSE TOPICS</i>	<i>Sections covered</i>
Electric Fields, [Coulomb's Law], Gauss' Law, E, D, V)	4.2-4.6, 4.8
Convection/conduction current, conductors, Polarization in dielectrics, Permittivity, conductors, [§5.3-5.5] resistance, capacitance [§6.5]	5.3-5.5 6.5
[Biot Savart Law], Ampere's Law, Magnetic fields and flux, Flux Density, Magnetic Potentials , [§7.2-7.5, 7.7]	7.2-7.5, 7.7
Magnetic Force, torque, moment, dipole, inductors, Magnetic circuits [§8.2-8.3, 8.5-8.6, 8.8, 8.10]	8.2-8.3, 8.5-8.6, 8.8, 8.10
Faradays Law, Transformer & Motional emf, Maxwell Eqs., time varying potentials and Time Harmonic fields [§9.2-9.7]	9.2-9.7
Plane waves, waves in different media, power and Poynting vector, incidence at normal angles. [§10.2-10.8]	10.2-10.8
Transmission lines: Parameters, equations, Input impedance, SWR, power, Smith Chart [§11.2-11.5]	11.2-11.5

**\*\*There might be changes to the above syllabus. In that case, changes will be notified to the students in class. Students absent or late to class are responsible for knowing any changes announced in class during their absence. \*\*\*\***