



University of Puerto Rico
Mayagüez Campus
College of Engineering
Electrical and Computer Engineering
Bachelor of Science in Computer Engineering
Course Syllabus



1. General Information:
Alpha-numeric codification: INEL 4151 Course Title: Electromagnetics I Number of credits: 3 Contact Period: 3 hours of lecture per week Contact Period: Required in INEL Course coordinator's name: RF Systems & Microwave Remote Sensing Committee
2. Course Description:
English: 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; wave equation. Spanish: Campos eléctricos y magnéticos estáticos y variables con el tiempo; materiales dieléctricos, magnéticos y conductores; capacitancia, inductancia y conductividad; circuitos magnéticos, histéresis dieléctrica y magnética; ecuaciones de Maxwell.
3. Pre/Co-requisites and other requirements:
Pre-requisites (FISI 3172 or FISI 3162) and (MATE 3063 or MATE 3185) Corequisites: MATE 4009
4. Course Objectives:
Describe the fundamental concepts of the interaction of electric and magnetic fields with matter. Introduce Maxwell's equations and their physical significance.
5. Instructional Strategies:
6. Minimum or Required Resources Available:

7. Course time frame and thematic outline:																																		
Outline	Contact Hours																																	
Electric field intensity and flux density, Gauss's law and electric potential	6.0																																	
Conductors, resistance and capacitance	5.0																																	
Magnetic field intensity and flux density, Ampere's circuit law and magnetic potential	5.0																																	
Magnetic forces, materials, inductance, mag; circuits, Faradays law	5.0																																	
Maxwell's equations	10.0																																	
Plane wave equations, propagation, and reflection at normal incidence	3.0																																	
Transmission lines parameters and equations, SWR, Power and Smith Chart	8.0																																	
Exams	3.0																																	
Total hours: (equivalent to contact period)	45																																	
8. Grading System																																		
<input checked="" type="checkbox"/> Quantifiable (letters) <input type="checkbox"/> Not Quantifiable																																		
9. Evaluation Strategies																																		
	<table border="1"> <thead> <tr> <th></th> <th>Quantity</th> <th>Percent</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> Exams</td> <td>3</td> <td>60.00</td> </tr> <tr> <td><input checked="" type="checkbox"/> Final Exam</td> <td>1</td> <td>20.00</td> </tr> <tr> <td><input type="checkbox"/> Short Quizzes</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Oral Reports</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Monographies</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Portfolio</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Projects</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Journals</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Other, specify: Homework</td> <td>4</td> <td>20.00</td> </tr> <tr> <td>TOTAL:</td> <td></td> <td>100%</td> </tr> </tbody> </table>		Quantity	Percent	<input checked="" type="checkbox"/> Exams	3	60.00	<input checked="" type="checkbox"/> Final Exam	1	20.00	<input type="checkbox"/> Short Quizzes			<input type="checkbox"/> Oral Reports			<input type="checkbox"/> Monographies			<input type="checkbox"/> Portfolio			<input type="checkbox"/> Projects			<input type="checkbox"/> Journals			<input checked="" type="checkbox"/> Other, specify: Homework	4	20.00	TOTAL:		100%
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10. Bibliography:																																		
Textbook: Elements of Electromagnetics, 4th edition, M.N.O. Sadiku, Oxford University Press, NY, 2007.																																		

11. Regulations:**According to Law 51**

Law 51: The Comprehensive Educational Services Act for People with disabilities states that after identifying with the instructor and the institution, the student with disabilities will receive reasonable accommodation in their courses and evaluations. For more information contact the Department of Counseling and Psychological services at the Office of the Dean of Students (Office DE 21) or call 787-265-3864 or 787-832-4040 x 3772, 2040 and 3864.

12. Academic Integrity:

The University of Puerto Rico promotes the highest standards of academic and scientific integrity. Article 6.2 of the UPR Students General Bylaws (Board of Trustees Certification 13, 2009-2010) states that academic dishonesty includes, but is not limited to: fraudulent actions; obtaining grades or academic degrees by false or fraudulent simulations; copying the whole or part of the academic work of another person; plagiarizing totally or partially the work of another person; copying all or part of another person answers to the questions of an oral or written exam by taking or getting someone else to take the exam on his/her behalf; as well as enabling and facilitating another person to perform the aforementioned behavior. Any of these behaviors will be subject to disciplinary action in accordance with the disciplinary procedure laid down in the UPR Students General Bylaws.—

13. Policy Against Discrimination Based on Sex, Sexual Orientation, and Gender Identity:

The University of Puerto Rico prohibits discrimination based on sex, sexual orientation, and gender identity in any of its forms, including that of sexual harassment. According to the Institutional Policy Against Sexual Harassment at the University of Puerto Rico, Certification Num. 130, 2014-2015 from the Board of Governors, any student subjected to acts constituting sexual harassment, may turn to the Office of the Student Ombudsperson, the Office of the Dean of Students, and/or the Coordinator of the Office of Compliance with Title IX for an orientation and/or formal complaint.

14. Sexual Harassment: Certification 130-2014-2015 states:

Sexual harassment in the workplace and in the study environment is an illegal and discriminatory act and is against the best interests of the University of Puerto Rico. All persons who understand they have been subject to acts of sexual harassment at the University of Puerto Rico may file a complaint and request that the institution investigate, where necessary, and assume the corresponding action by the university authorities. If the complainant is a student, he or she must refer his or her complaint to the Office of the Student Ombudsperson or that of the Dean of Students.

15. Certification 06-43 of the Academic Senate states, "The academic guidelines for offering online courses," defines:

Traditional face-to-face courses are those that have less than 25% of the course's regular contact hours via the Internet. Therefore, a three-credit course will be considered "face to face" if, of the 45 hours of regular contact, 11 or less are taught via the Internet. According to certification 16-43 of the Academic Senate, a course may include up to 25% of its total contact hours via the Internet. The objective of this is so that all professors have this alternative in the case of any unscheduled eventuality.

16. Contribution of Course to meeting the requirements of Criterion 5:

Engineering Topic

Specific goals for the course

#	Course Outcomes	ABET Student Outcomes
1	Solve electrostatic problems using Gauss's law.	1
2	Analyze capacitors and resistors using Gauss's law	1
3	Solve magneto static problems using Bios-Savart's law and Ampere's law	1
4	Describe the differences between diamagnetic, a paramagnetic and ferromagnetic materials	1
5	Find the inductance and magnetic force on different a structures	1
6	Design simple capacitors, resistors and inductors	2
7	Determine the energy density in the electric and magnetic a fields for different a configurations	1
8	Formulate the equation for a plane wave traveling in a unbounded general medium	1
9	Calculate the reflection and transmission coefficients for normal incidence for a dielectric interface and a dielectric-perfect electric conductor interface	1
10	Calculate the reflection and transmission coefficients for normal incidence for a dielectric conductor interface	1
11	Describe the electromagnetic fields inside a transmission line	1
12	Calculate the reflection coefficient for a terminated transmission line	1,2
13	Use the Smith Chart to find reflection coefficients and impedances	1

Grading System: A:100-90, B:89-80, C:79-70, D:69-60, F:59-0.

Evaluation Strategies:

Quizzes	10 pts
Assignments	50 pts
Partial Exams	300 pts (3 @ 100 pts each)
Final Exam	100 pts
Total Points:	460 pts

Partial Exams: All during class period. [Sep 9](#), [Oct 11](#), [Nov 13](#).

Instructor: José M. Rosado Román, PhD

Phone: 787-832-4040 x5832 (VoIP)

Office Hours: MWF 7:30-9:20 in OF-327

E-mail: jrosado@ece.uprm.edu

WWW: <http://ece.uprm.edu/~jrosado/>

RULES IN CLASS:

- 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. The final exam will serve as reposition for any missed partial exams.
- Class attendance is required. You are expected to arrive on time to class. I reserve the right to lock the door after 5 minutes of class start for the benefits of the other students.
- Dishonest behavior, as commonly understood, which includes exam cheating or plagiarism, will result in at least a zero for the item, 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 arises.
- 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.