

INEL 4075



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 4075

Course Title: Fundamental of Electrical Engineering

Number of credits: 3

Contact Period: 3 hours of lecture per week

Contact Period: Required to selected engineering programs

Course coordinator's name: Academic Affairs Committee

2. Course Description:

English: Laws and fundamental concepts that govern the behavior of electric and magnetic circuits; ideal models of resistors, voltage and current sources, capacitors and inductors; three-phase circuits and transformers.

Spanish: Leyes y conceptos fundamentales que gobiernan el comportamiento de los circuitos eléctricos y magnéticos; modelos ideales de resistencias, fuentes de voltaje y corriente, condensadores e inductores; circuitos trifásicos y transformadores.

3. Pre/Co-requisites and other requirements:

Pre-requisites

(MATE 3063 or MATE 3185) and (FISI 3172 or FISI 3162).

4. Course Objectives:

The objective of this course is to introduce students to electric circuit analysis techniques, including the Kirchhoff's Laws. Basic circuits elements such as, transformer, operational amplifiers, resistors, inductors, capacitors, dependent and independent sources are introduced. Simplification of electrical circuits is considered using various techniques, including Thevenin's and Norton's theorems. Single-phase circuits power analysis and first-order linear circuit analysis techniques are also presented.

5. Instructional Strategies:

☒conference ☒discussion ☐computation ☐laboratory

7. Course time frame and thematic outline:	
Outline	Contact Hours
Circuit variables and units.	2.0
Electric circuits, current, voltage, power, energy, active and passive circuits, resistors, Ohm's law, independent sources, connecting voltmeter and ammeter, dependent sources, transducer, switches.	5.0
KCL, KVL, series resistor, voltage divider, parallel resistor, current divider	4.0
Techniques of circuit analysis: resistance equivalence, node voltage analysis, mesh analysis, superposition, Thevenin's theorem, and Norton's equivalent circuit	12.0
The ideal operational amplifier and applications	3.0
Inductance (L), Capacitance (C) and first order systems	4.0
AC, sinusoidal sources, phasors, impedance and admittance	6.0
Power; instantaneous, average (P), reactive (Q), complex (S) and power factor (pf). Maximum power transfer.	3.0
Coupled inductors, ideal transformer.	2.0
Three phase voltages, sequence, Y-Y circuit, analysis of Y-Y balanced circuit	1.0
Exams	3.0
Total hours: (equivalent to contact period)	45
8. Grading System	
☒ Quantifiable (letters) ☐ Not Quantifiable	

9. Evaluation Strategies

	Quantity	Percent
☒ Exams	3	20.00
☒ Final Exam	1	20.00
☒ Short Quizzes		10.00
☐ Oral Reports		
☐ Monographies		
☐ Portfolio		
☐ Projects		
☐ Journals		
☒ Other, specify: Homework		10.00
TOTAL:		100%

10. Bibliography:

Hambley, Allan R., Electrical Engineering Principles and Applications, 6th Edition, Prentice Hall, 2014.

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

Description prepared by the ICOM Steering Committee on 6/2008.

Syllabus B.

Instructor Information Sheet

1. General Information:

Instructor: Alberto Ramirez Orquin, Ph.D.

Title: Professor

Office: SA-412

Phone: 832-4040 ext. 3693

E-mail orquinalberto@gmail.com

Website: ece.uprm.edu/~aramirez

2. Instructional Strategy:

The course will consist of lectures, discussions and problem solving.

3. Evaluation/Grade Policy:

Three exams for each 20 % (No test will be eliminated), plus a Final Exam for 30%

Homework and Quizzes (HW/Q) worth 10 %

Each student is expected to participate all the classes, submits all the homework's and takes all the quizzes

The curve is: 100-90 A, 89-80 B, 79-70 C, 69-60 D, 59 or less F.

4. Office hours

LMV 8.30/10.30 AM Make appointment at orquinalberto@gmail.com