

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

Course Syllabus

1. General Information:	
Alpha-numeric codification: INEL 3105 Course Title: ELECTRICAL SYSTEMS ANALYSIS I Number of credits: 3 Contact Period: 3 hours of lecture per week Required in INEL and ICOM	
2. Course Description:	
English: Analysis of direct current and alternating current linear electric circuits; laws and concepts that characterize their behavior. Spanish: Análisis de circuitos eléctricos lineales de corriente continua y de corriente alterna; las leyes y conceptos que caracterizan su comportamiento.	
3. Pre/Co-requisites and other requirements:	
MATE 3032 or MATE 3184. Co-requisites: (FISI 3172 or FISI 3162) and (MATE 3063 or MATE 3185).	
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:	
<input checked="" type="checkbox"/> conference <input checked="" type="checkbox"/> discussion <input type="checkbox"/> computation <input type="checkbox"/> laboratory <input type="checkbox"/> seminar with formal presentation <input type="checkbox"/> seminar without formal presentation <input type="checkbox"/> workshop <input type="checkbox"/> art workshop <input type="checkbox"/> practice <input type="checkbox"/> trip <input type="checkbox"/> thesis <input type="checkbox"/> special problems <input type="checkbox"/> tutoring <input type="checkbox"/> research <input type="checkbox"/> other, please specify:	
6. Minimum or Required Resources Available:	
P-Spice, MATLAB, and demonstration of Practical Drive Systems in Laboratory	
7. Course time frame and thematic outline	
Outline	Contact Hours
Circuit variables and units.	2
Circuit elements, Kirchhoff's laws.	5
Resistive circuits.	4
Techniques of circuit analysis and software simulation	10
The ideal operational amplifier and its inverting and non-inverting configurations.	3
Inductance (L), Capacitance (C) and Mutual Inductance (the transformer in the time domain).	4
The phasor and the frequency domain.	6
Power; instantaneous, average (P), reactive (Q), complex (S) and power factor (pf). Maximum power transfer.	3
RC, RL and RLC circuits.	5
Exams	3
Total hours: (equivalent to contact period)	45
8. Grading System	
<input checked="" type="checkbox"/> Quantifiable (letters) <input type="checkbox"/> Not Quantifiable	
9. Evaluation Strategies (Suggested): The faculty member teaching the course will provide the student with the evaluation strategy he/she will be using throughout the semester. This will be done within the first week of	

classes.

	Quantity	Percent
<input checked="" type="checkbox"/> Exams	3	20
<input checked="" type="checkbox"/> Final Exam	1	20
<input checked="" type="checkbox"/> Short Quizzes	5	10
<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: Assignment	5	10
TOTAL:		100%

10. Bibliography:

J. David Irwin; John Wiley, Basic Engineering-Circuits Analysis, 9th Edition, John Wiley.

11. According to Law 51

Students will identify themselves with the Institution and the instructor of the course for purposes of assessment (exams) accommodations. For more information please call the Student with Disabilities Office which is part of the Dean of Students office (Chemistry Building, room 019) at (787)265-3862 or (787)832-4040 extensions 3250 or 3258.

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

Math	Basic Science	General	Engineering Topic
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13. Course Outcomes

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|---|-----|
| 1. Apply circuit analysis techniques to understand the physical operation of a electrical circuit system. | (a) |
| 2. Perform basic power calculations applying complex variable concepts. | (a) |
| 3. Perform transient and steady state calculations in RC, RL and RLC circuits. | (a) |
| 4. Interpretation of the results of simulation of electrical circuits | (b) |
| 5. Be able to interpret and draw electrical schematic diagrams. | (g) |
| 6. Be able to communicate graphically where appropriate. | (g) |
| 7. Simulate electrical circuits using commercially available software for circuit analysis. | (k) |

Map to Program Outcomes

Person(s) who prepared this description and date of preparation: Academic Affairs Committee – feb 2007, Submitted: Raúl E. Torres, Committee Coordinator. Revised by: Raúl E. Torres, Jan 2008.