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

Course Syllabus

1. General Information:

Alpha-numeric codification: INEL 4115
Course Title: ELECTRICAL MEASUREMENTS LABORATORY
Number of credits: 3
Contact Period: One two-hour laboratory per week.

Required in INEL & ICOM

2. Course Description:

English: Experiments with electronic components and equipment; measurement techniques.

Spanish: Experimentos con componentes y equipo electrónico; técnicas de medición.

3. Pre/Co-requisites and other requirements:

Co-requisite: INEL 3105 and INEL 4201.

4. Course Objectives:

The primary objective is to familiarize students with the physical properties of electronic components, while providing practical experience with modern measurement instruments and techniques, stressing safety in the workplace. Secondary objectives are to expand the student's ability to communicate technical information through technical reports and to continue developing team-working skills.

5. Instructional Strategies:

☒conference ☒discussion ☐computation ☐laboratory

☒seminar with formal presentation ☐seminar without formal presentation ☒workshop

☐art workshop ☐practice ☐trip ☐thesis ☒special problems ☐tutoring

☐research ☐other, please specify:

6. Minimum or Required Resources Available:

7. Course time frame and thematic outline

Outline	Contact Hours
Safety in the laboratory. Resistor color code and tolerance. Variable Resistors	1
Voltage and current measurement in a electric circuit, Ohm's Law, series resistive circuits	1
Kirchhoff's voltage law, Voltage dividers, Kirchhoff's current law, current dividers	1
Troubleshooting in series circuits, parallel resistive circuits, troubleshooting in parallel circuits, series-parallel combinations.	1
Superposition, Thevenin's and Norton's Theorems, Maximum power transfer	1
Oscilloscope familiarity I and II, Function Generator Familiarity I and II	2
Basic power measurements: RMS values, P, Q, S, power factor	1
The series RC sinusoidal response, parallel RC sinusoidal response, series RLC circuit	1
Series resonance, parallel resonance	1
Low-pass filter, high-pass filter, band-pass filter	1
Test	2
Total hours: (equivalent to contact period)	13

8. Grading System

☒Quantifiable (letters) ☐ 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
☐ **Exams**		
☐ **Final Exam**		
☒ **Short Quizzes**		
☐ **Oral Reports**		
☐ **Monographies**		
☐ **Portfolio**		
☒ **Projects**		
☐ **Journals**		
☐ **Other, specify: Homework**	____	
TOTAL:		**100%**

10. Bibliography:

Laboratorio de Medidas Eléctricas, 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

Engineering Science: 1 credits

Engineering Design: 0 credits

13. Course Outcomes	**Map to Program Outcomes**
1. Apply circuit analysis techniques to understand the physical operation of an electrical circuit system.	a
2. Be able to set up and safely perform basic electrical laboratory procedures.	b
3. Be able to graphically and verbally represent or describe experimental data sets.	b
4. Be able to analyze, interpret, and draw conclusions based on experimental data.	b
5. Be able to work in teams to complete laboratory work and assignment.	d
6. Be able to interpret and draw electrical schematic diagrams.	g
7. Simulate electrical circuits using commercially available software for circuit analysis.	k

Person(s) who prepared this description and date of preparation: Academic Affairs Committee Feb 2007. Submitted by: Raúl E. Torres, Committee Coordinator, March 07. Revised by: Academic Affairs Committee, May 15, 2008.