

University of Puerto Rico
Mayagüez Campus
College of Engineering

Syllabus & Instructor Information Sheet Form

A. COURSE SYLLABUS

1. General Information: Course Number: INEL 4075 Course Title: FUNDAMENTALS OF ELECTRICAL ENGINEERING Credit-Hours: 3
2. Course Description: Laws and fundamentals 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. Not for electrical or computer engineering students.
3. Pre-requisites: MATE 3063 and FISI 3172
4. Textbook, Supplies and Other Resources: <i>R. Dorf and J.A. Svodoba, Introduction to Electric Circuits, 6th Edition, John Wiley, 2003</i>
5. Purpose: The purpose of the course is to introduce engineering students other than electrical engineering students to the basic concepts needed to analyze electric circuits.
6. Course Goals: After completing the course the student should be able to analyze a DC or an AC electric circuit using the techniques learned in class. In addition, the student should be able to solve circuit problem containing components such as operational amplifiers and ideal transformers. The student should be able to perform sinusoidal steady-state power calculations and to analyze a three-phase balanced circuit.
7. Requirements: Differential and integral calculus; ability to solve simultaneous linear algebraic equations.
8. Laboratory/Field Work (If applicable): No laboratory or field work in this course.
9. Department/Campus Policies: 9a. Class attendance: Class attendance is compulsory. The University of Puerto Rico, Mayagüez Campus, reserves the right to deal at any time with individual cases of non-attendance. Professors are expected to record the absences of their students. Frequent absences affect the final grade, and may even result in total loss of credits. Arranging to make up work missed because of legitimate class absence is the responsibility of the student. (Bulletin of Information Undergraduate Studies, pp. 39 1995-96) 9b. Absence from examinations: Students are required to attend all examinations. If a student is absent from an examination for a justifiable reason acceptable to the professor, he or she will be given a special examination. Otherwise, he or she will receive a grade of zero or "F" in the examination missed. (Bulletin of Information Undergraduate Studies, pp. 39, 1995-96) 9c. Final examinations: Final written examinations must be given in all courses unless, in the judgment of the Dean, the nature of the subject makes it impracticable. Final examinations scheduled by arrangements must be given during the examination period prescribed in the Academic Calendar, including Saturdays. (see Bulletin of Information Undergraduate Studies, pp. 39, 1995-96). 9d. Partial withdrawals: A student may withdraw from individual courses at any time during the term, but before the deadline established in the University Academic Calendar. (see Bulletin of Information Undergraduate Studies, pp. 37, 1995-96). 9e. Complete withdrawals: A student may completely withdraw from the University of Puerto Rico, Mayagüez Campus, at any time up to the last day of classes. (see Bulletin of Information Undergraduate Studies, pp. 37, 1995-96).

9f. Disabilities: All the reasonable accommodations according to the Americans with Disability Act (ADA) Law will be coordinated with the Dean of Students and in accordance with the particular needs of the student.

9g. Ethics: Any academic fraud is subject to the disciplinary sanctions described in article 14 and 16 of the revised General Student Bylaws of the University of Puerto Rico contained in Certification 018-1997-98 of the Board of Trustees. The professor will follow the norms established in articles 1-5 of the Bylaws.

10. General Topics:

LECTURES	TOPIC	SECTIONS
2	Electric circuits, current, voltage, power, energy. Active and passive circuits, resistors, Ohm's Law.	1.3, 1.5, 1.6, 2.4, 2.5
2	Independent sources, connecting voltmeter and ammeter. Dependent sources, transducer, switches.	2.6, 2.7 2.8, 2.9, 2.10
3	Circuit terminology, KCL, KVL. Series resistor, voltage divider, examples. Parallel resistor, current divider, examples.	3.2, 3.3 3.4 3.5, 3.6
1	Circuit analysis reducing to equivalent resistance.	3.7
3	Source transformation, circuit analysis using source transformation technique Node Voltage Analysis w/ current source, matrices to solve system of equations. Examples with current and voltage source, example w/ dependent source, example with supernode.	5.3 4.3 4.4, 4.5
2	Mesh Current Analysis. Examples with current and voltage source, supermesh.	4.6 4.7
5	Superposition and examples. Thevenin's Theorem (R_{th} , V_{th}) and examples Norton's Equivalent Circuit Maximum Power Transfer	5.4 5.5 5.6 5.7
3	Ideal Operational Amplifier Examples and applications for inverting and non-inverting configurations, voltage follower and the summing amplifier	6.4, 6.5
3	Inductor and capacitor.	7.3, 7.4, 7.5, 7.6, 7.7, 7.8
4	AC, sinusoidal sources. Complex numbers, phasor concept. Phasor Relationship for R, L, and C Impedance and Admittance	10.2, 10.3 10.6 10.7 10.8
2	Examples of AC Analysis using phasors	
5	Periodic Waveform, average and effective values. Complex Power, apparent power, average power, reactive power . power factor, correcting p.f., maximum power transfer. Examples	11.3, 11.4 11.5 11.6, 11.8
2	Coupled inductors, ideal transformer.	11.9, 11.10
5	Three phase voltages, sequence, Y-Y circuit, analysis of Y-Y balanced circuit. Δ -connected source and load, Δ -Y transformation Y- Δ circuit, analysis of Y- Δ balanced circuit.	12.3 12.4 12.5 12.6
3	Exams	

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B. Instructor Information Sheet

1. General Information:

Instructor: Nayda G. Santiago Santiago
Title: Assistant Professor
Office: S-215
Phone: 832-4040 Ext. 3510
Office Hours: Mon, Wed, & Fri 8:30am-9:30am
E-mail / URL: Nayda.Santiago@ece.uprm.edu / <http://www.ece.uprm.edu/~nayda>
Course URL: <http://www.ece.uprm.edu/~nayda/Courses/poetas/>

2. Course Description:

Course Number: INEL 4075
Course Title: Fundamentals of Electrical Engineering
-- See item number 2 in Course Syllabus Section for Course Description.

3. Purpose:

The purpose of the course is to introduce engineering students other than electrical engineering students to the basic concepts needed to analyze electric circuits.

4. Requirements

All students are expected to:

- Complete all lessons.
- Do all assigned readings and related homework.
- Come to class all the time and on time.
- Pass all tests to receive credit for the course.

5. Laboratory/Field Work (If applicable), General Rules:

No laboratory project or fieldwork is required.

Radios, tape recorders, and other audio or video equipment are not permitted in the classroom at any time.

Cellular Phones and pagers should be in quiet mode in the classroom and OFF during exams. Smoking is not permitted in any area other than those areas designated for smoking.

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6. Instructional Strategy:

The course will consist mainly of lectures. Students will be assigned problems as homework to be individually solved for their own benefit. Students should have a problem notebook to solve all assigned problems. Not all problems will be collected for grading, however, failure to complete homework problems will adversely affect students skills to master the material. Quizzes will test the student ability to solve the problems. There will also be homeworks to collect in class. These will count towards the final grade.

8. Evaluation/Grade Reporting:

Evaluation will be based on three midterm exams, a set of quizzes, and a final exam weighted as indicated below:

Midterm 1:	20%
Midterm 2:	20%
Midterm 3:	20%
Quizzes & Hwks	20%
Final Exam:	20%

Total:	100%

Quizzes and homeworks will count towards one grade. The lowest grade in a quiz will be dropped and others will count towards the grade. We will not have makeup quizzes. There will be a quiz evaluating the material taught from the date of midterm 3 to the end of class.

Final grades will be assigned according to the following scale:

0	-	59	F
60	-	69	D
70	-	79	C
80	-	89	B
90	-	100	A

9. Deadlines:

Important dates:

Exam 1: Tuesday, September 14, 2005
Exam 2: Thursday, October 14, 2005
Exam 3: Thursday, November 16, 2005
Final Exam: To be arranged by registrar's office
All exams will be held during the class hour.

10. Attendance and Behavior:

- Attendance will be daily monitored in class.
- Students are not allowed to leave the classroom during class except in exceptional circumstances.
- It is the student responsibility to ensure signing-up everyday the attendance list to be circulated by the professor at the beginning of each class.
- Approximately, every 15 lectures an attendance report will be generated.
- A student with more than 3 (three) missed lectures in a reporting period will be considered not to be regularly attending class.
- Make-up for exams will be furnished only upon "valid excuse". Your professor reserves the

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right to determine what is a “valid excuse”.

- **There will be no make-up for quizzes.**
- No baseball caps allowed during quizzes or exams.
- No “special” projects will be given to anyone to improve grades or for any other reason.
- Students are not allowed improper behavior.
- Honesty is expected from all students. If a student is caught cheating during an exam, quiz or homework, this clearly demonstrates that he or she is not capable of producing individual intellectual property material. Therefore the student will face the following sanctions:
 - The grade will be zero in the piece of work where cheating was found.
 - The department will be notified of the student name and evidence of cheating so the department determines if disciplinary action should be taken to the “Junta de Disciplina”. If there is a pending case at the “Junta de Disciplina”, the student will be awarded an incomplete with F until the “Junta de Disciplina” decides the case.

12. Instructor Responsibilities (If applicable):

Your instructor will provide handouts for material discussed in class not covered in the textbook.

13. Course Outline And Schedule:

--See item 11 in Course Syllabus Section

14. Additional References:

--See item 4 in Course Syllabus Section