

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 4407 Course Title: Electrical System Design I Number of credits: 3 Contact Period: 45 Elective in INEL		
2. Course Description:		
English: Design of electrical systems for buildings; wiring systems, illumination, protection and grounding.		
Spanish: Diseño de sistemas eléctricos de edificios; alambrado, iluminación, protección y sistema de puesta a tierra.		
3. Pre/Co-requisites and other requirements:		
INEL 4103 (pre-requisite)		
4. Course Objectives:		
This is a course for majors in electrical engineering. After completing the course, the student should be able to design electrical systems for buildings and select appropriate systems components including wiring, illumination, protection devices, grounding system and buildings' electrical power supply.		
5. Instructional Strategies:		
<input checked="" type="checkbox"/> conference <input checked="" type="checkbox"/> discussion <input type="checkbox"/> computation <input type="checkbox"/> laboratory <input checked="" type="checkbox"/> seminar with formal presentation <input type="checkbox"/> seminar without formal presentation <input checked="" type="checkbox"/> workshop <input type="checkbox"/> art workshop <input type="checkbox"/> practice <input type="checkbox"/> trip <input type="checkbox"/> thesis <input checked="" type="checkbox"/> special problems <input type="checkbox"/> tutoring <input type="checkbox"/> research <input type="checkbox"/> other, please specify:		
6. Minimum or Required Resources Available:		
All students are expected to bring a solid background in electric power systems fundamentals. Students must always bring to class the current edition of the National Electrical Code (NFPA 70), and a scientific calculator (preferably one that handles complex numbers).		
7. Course time frame and thematic outline		
	Outline	Contact Hours
	Introduction to buildings electrical system design	3
	Introduction to the NEC	6
	Single family dwellings	6
	Grounding and Bonding, NEC Article 250	3
	Local requirements and other NEC articles	6
	Multifamily dwellings and Transformer loading	3
	Comercial buldings and Transformer spesifications	9
	Voltage drop computation and compliance	3
	Short circuit analysis and device specifications	3
	Motor circuits, Article 430	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 type="checkbox"/> Exams		

<input type="checkbox"/> Final Exam		
<input checked="" type="checkbox"/> Short Quizzes	<u> 7 </u>	80%
<input type="checkbox"/> Oral Reports		
<input type="checkbox"/> Monographies		
<input type="checkbox"/> Portfolio		
<input checked="" type="checkbox"/> Projects	<u> 1 </u>	20%
<input type="checkbox"/> Journals		
<input type="checkbox"/> Other, specify: Homework	<u> </u>	
TOTAL:		100%

10. Bibliography:

National Electric Code, NFPA (2008).

Glover, J.D. and Sarma, M (2002) Power System Analysis and Design. Third Edition. Pacific Grove, California: Brooks/Cole.

Saadat, H. (1999) Power System Analysis. Boston, Maryland: WCB McGraw-Hill.

Anderson, P.M. (1995) Analysis of Faulted Power Systems. Reprint. New York, New York: IEEE Press.

Instructor assigned material will be announced.

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: 2 credits

13. Course Outcomes

Map to Program Outcomes

- Possess sufficient knowledge of power system analysis that will enable them to understand the physical operation of the wiring system and the power sub-stations. (a)
- Be able to apply complex variable concepts to the solution of wiring system problems. (a)
- Be able to follow logical and orderly design procedures to choose the best solution for the relaying of the power system. (c)
- Be able to determine criteria to compare the designed outcome and to estimate the cost of the electrical installation. (c)
- Be able to identify ethical issues faced on the solution to the buildings power distribution design. (f)
- Be able to write effectively and be understood by technical audience (other engineering and electrical contractors) (g)
- Be able to communicate graphically using construction drawings and symbols. (g)
- Be aware of modern devices used in wiring and grounding systems. (k)
- Apply computer software as a tool for design computations (k)

Person(s) who prepared this description and date of preparation: Lionel Orama.

Submitted by: Efrain O'Neill, Dec 2006

