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 4407
Course Title: Electrical System Design I
Number of credits: 3
Contact Period: 45

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 appropiate systems components including wiring, illumination, protection devices, grounding system and buildings' electrical power supply.

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:

All students are expected to bring a solid background in electric power systems fundamentals. Students must always bring to class the 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 spesicfications	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

☒ Quantifiable (letters) ☐ Not Quantifiable

9. Evaluation Strategies

	Quantity	**Percent**
☐ **Exams**		
☐ **Final Exam**		
☒ **Short Quizzes**	**__7__**	**80%**
☐ **Oral Reports**		
☐ **Monographies**		
☐ **Portfolio**		
☒ **Projects**	**1**	**20%**
☐ **Journals**		
☐ **Other, specify: Homework**	**_____**	
TOTAL:		**100%**

10. Bibliography:

Instructor notes available on Web.

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. Course Outcomes **Map to Program Outcomes**

1. Possess sufficient knowledge of power system analysis that will enable them to understand the physical operation of the wiring (a)

system and the power sub-stations.

2. Be able to apply complex variable concepts to the solution of wiring system problems. (a)
3. Be able to follow logical and orderly design procedures to choose the best solution for the relaying of the power system. (c)
4. Be able to determine criteria to compare the designed outcome and to estimate the cost of the electrical installation. (c)
5. Be able to identify ethical issues faced on the solution to the buildings power distribution design. (f)
6. Be able to write effectively and be understood by technical audience (other engineerins and electrical contractors) (g)
7. Be able to communicate graphically using construction drawings and symbols. (g)
8. Be aware of modern devices used in wiring and grounding systems. (k)
9. Apply computer software as a tool for design computations (k)
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