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 4408
Course Title: Electrical Systems Design II
Number of credits: 3
Contact Period: 45

## 2. Course Description:

English: Design of electrical systems for buildings: power supply, exterior illumination, signal systems, and emergency/standby power equipment..

Spanish: Diseño de sistemas eléctricos de edificios: el sistema de potencia, iluminacion exterior, sistemas de señales, y sistemas de generacion para emergencias.

## 3. Pre/Co-requisites and other requirements:

INEL 4407

## 4. Course Objectives:

This course is designed to give students in electric power engineering the hands on design practice of illumination, signal systems design, and emergency/standby power equipment requirements for different types of buildings.

## 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 and design of residential wiring. 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 |
|---|---|
| Signal systems design: residential building design; commercial building design; institutional building design; grounding requirements; protection requirements; voltage drop considerations; substation design; short circuit calculations, lighting calculations. | 36 |

| | |
|---|---|
| Emergency/standby power equipment | 6 |
| Exams | 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) |
| 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. | Use computer software as a tool for design computations and drawing | (k) |
| 10. | | |
| 11. | | |
| 12. | | |
| 13. | | |
| 14. | | |
| 15. | | |
| 16. | | |
| 17. | | |
| 18. | | |
| 19. | | |
| 20. | | |
| 21. | | |
| 22. | | |
| 23. | | |
| 24. | | |