University of Puerto Rico
Mayagüez Campus
College of Engineering
Department of
B.S. in Electrical Engineering

Course Syllabus

1. General Information:

Alpha-numeric codification: INEL 5325
Course Title: COMMUNICATION SYSTEM DESIGN: CIRCUITS AND ANTENNAS
Number of credits: 3
Contact Period: 1 hour of lecture plus 2 sessions of 2 hours of lab per week
Elective in INEL

2. Course Description:

English: Design of communication circuits and antennas. Several design projects including; specification, evaluation and selection of alternatives and implementation. Written reports and computer use required.

Spanish: Diseño de circuitos de comunicaciones y antenas. Varios proyectos de diseño que incluyen: especificación, evaluación y selección de alternativas e implantación. Se requieren informes escritos y uso de computadora.

3. Pre/Co-requisites and other requirements:

INEL 5305 o INEL 5306

4. Course Objectives:

To unify the concepts from various courses in the Applied Electromagnetic option and to provide students the opportunity to design several system components and to integrate them in a system, following a given set of specifications.

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: oral presentation of a design project.

6. Minimum or Required Resources Available:

Network analyzer, spectrum analyzer, signal generators and other microwave equipment. Use of commercial communication systems and several software packages.

7. Course time frame and thematic outline

Outline	**Contact Hours**
This is a project-oriented course, which includes specifying a systems, considering alternatives, considering cost factors, and implementing a design using software packages. Written and oral reports will be required.	75
Labs and field experiments with commercial equipment	30
Review of courses of the Applied EM option.	5
Project specifications, FCC, ITU-R,IEEE regulations and standars	5
Use of software packages (i.e.,Radio Mobil) for system design	5
Use of Matlab to simulate signals and determine link reliability	5
Identify providers and cost of required equipment and components	5
Discussion of project design, and of the state of the art and future trends of telecommunication systems	15
Design project oral presentations and exams	5
Total hours: (equivalent to contact period)	75

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**	**2**	**33.33%**
☐ **Final Exam**		
☐ **Short Quizzes**		
☒ **Oral Reports**	**1**	**33.33%**
☐ **Monographies**		
☐ **Portfolio**		
☒ **Projects**	**1**	**33.33%**
☐ **Journals**		
☐ **Other, specify:**		

10. Bibliography:

Tse, David&Viswanath, Pramod (2005), Wireless Communication, New York, NY, Cambridge University Press.

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:

Math	Basic Science	General	Engineering Topic
			√

13. Course Outcomes

Develops a literature search on recent publications regarding current issues in engineering solutions of communications problems.	h, j
Applies the information gathered into the system design	i
Identifies the characteristics of the signals to be transmitted and received by the system	e
Identify frequency and radio propagation mechanisms to be used.	e
Use software package to analyze system components.	k
Do experimental measurements.	k
Identify the best suppliers of equipment and components required by the system.	f
Determine if the system complies with the human safety standards for EM radiation.	f
Determine if the system complies with the FCC, FAA, ITU requirements.	c
Prove that the system could be easily upgraded with the availability of new technologies.	i
Indicate the special efforts of each member of the team in the elaboration of particular aspects of the project.	d
Do executive summary and oral and written presentation of the project	g

Person who prepared this description and date of preparation: Electromagnetic Committee, March, 12, 2008. Submitted by: Dr. Rafael Rodríguez, Committee Coordinator, March, 12, 2008.