Plannar Antennas for Wireless Systems	**2015/2016**
Code: 42834 ECTS Credits: 6	

Degree	Type	Year	Semester
4313797 Telecommunication Engineering	OB	1	2

Contact

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Use of languages

Principal working language: spanish (spa)

Other comments on languages

English will be used if it is needed in case of foreing students or other needs. Nevertheless it can be used at any time.

Prerequisites

The student is supposed to have knowledge about radiation, guided waves, fundamental parameters of antenna and the transmission equation

Objectives and Contextualisation

Once completed the course the student should be able to:

1. Understand and describe the structures that are commonly used in the design of planar antennas.
2. Apply different techniques to adjust the antennas to the requirements of a particular application.
3. Use simulation tools to predict the behavior of these antennas.
4. Carry out measurements to obtain different antenna parameters.

Skills

- Capacity for developing radio communications systems: design of antennas, equipment and subsystems, channel modelling, calculation of links and planning.
- Students should know how to apply the knowledge they have acquired and their capacity for problem solving in new or little known fields within wider (or multidisciplinary) contexts related to the area of study
- Students should know how to communicate their conclusions, knowledge and final reasoning that they hold in front of specialist and non-specialist audiences clearly and unambiguously

Learning outcomes

1. Analyze antennas assessing whether they meet the requirements of an application.
2. Design antennas according to the requirements of a particular application.
3. Students should know how to apply the knowledge they have acquired and their capacity for problem solving in new or little known fields within wider (or multidisciplinary) contexts related to the area of study
4. Students should know how to communicate their conclusions, knowledge and final reasoning that they hold in front of specialist and non-specialist audiences clearly and unambiguously

5. Use electromagnetic simulation tools for the analysis and design of antennas

Content

1. Introduction
2. Fundamental parameters of antennas
3. Fundamentals of radiation
4. Dipole antennas
5. Loop antennas
6. Slot antennas
7. Microstrip antennas
8. Simulations Tools
9. Measurement Tecniques

Methodology

Guided activities:

- In the class: explanation of theorical contents with application examples
- In the lab: develop a planned activity using simulation tools and measurement techniques

Autonomous activities:

- Individual study of the subject
- Solving exercises, preparation of lab activities and reports

Supervised activities:

- Tutorials in small groups or individual meetings to clarify concepts, advise on the development of the course or attend other specific issues.

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Lab classes	15	0.6	3, 5
Theory classes	30	1.2	3, 4, 5
Type: Supervised			
Supervision meetings	15	0.6	3, 4, 5
Type: Autonomous			
Personal work	55	2.2	3, 4, 5

Evaluation

Evaluation activities:

Final Exam (FEx): 40% To pass is a must having FEx >= 4

Midterm Exam (MEx): 20%

Lab Reports + Lab Exam (LR): 25% Individual reports about the work developed in the lab + 5% Lab Exam. To pass, all the reports and exam must be rated >=4

Solving exercises(SE): 10%

The qualification "Not evaluated" will be only granted if the student does not participate in none of the evaluation activities

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Final exam	40%	3	0.12	3, 4, 5
Lab Reports + Lab Exam	30%	15	0.6	1, 2, 3, 4, 5
Midterm exam	20%	2	0.08	3, 4, 5
Solving exercises	10%	15	0.6	3, 4, 5

Bibliography

C.A Balanis, Antenna Theory, 3rd edition, John Wiley & Sons, 2005

J.L. Volakis, C. Chen, K. Fujimoto, Small Antennas: Miniaturization techniques and applications, McGraw-Hill, 2010

K.L. Wong, Planar antennas for Wireless Communications, John Wiley & Sons, 2003