

Plannar Antennas for Wireless Systems	2013/2014
Code: 42834 ECTS Credits: 6	

Degree	Type	Year	Semester
4313797 Enginyeria de Telecomunicacions / Telecommunication Engineering	OB	1	2

Contact

Name: Josep Parron Granados

Email: Josep.Parron@uab.cat

Use of languages

Principal working language: anglès (eng)

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

- Enginyeria de Telecomunicacions / Telecommunication Engineering
- 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. Analyse antennas considering whether they fulfil the requirements for an application
2. Produce antennas of different parameters
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

Content

1. Fundamental parameters of antennas and Friis transmission equation

2. Planar antennas
3. Miniaturization techniques
4. Impedance matching
5. Circular polarization
6. Multiband and wideband antennas
7. Antenna arrays
8. Simulations Tools
9. Antenna measurements

Methodology

Guided activities:

- In the class: explanation of theoretical 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	1, 2, 3
Theory classes	30	1.2	1, 2, 3, 4
Type: Supervised			
Supervision meetings	15	0.6	1, 2, 3, 4
Type: Autonomous			
Personal work	55	2.2	1, 2, 3, 4

Evaluation

Evaluation activities:

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

Midterm Exam (MEx): 20%

Lab reports (LR): 30% Individual reports about the work developed in the lab. To pass, all the reports must be rated ≥ 4

Solving exercises(SE): 10%

Evaluation activities

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

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