Course guide
230744 - AMLAB - Antennas and Microwaves for Communication Systems Laboratory

Last modified: 11/04/2025

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications.

Degree: MASTER'S DEGREE IN TELECOMMUNICATIONS ENGINEERING (Syllabus 2013). (Optional subject).
MASTER'S DEGREE IN ADVANCED TELECOMMUNICATION TECHNOLOGIES (Syllabus 2019). (Optional subject).

Academic year: 2025 **ECTS Credits:** 5.0 **Languages:** English

LECTURER

Coordinating lecturer: JORDI JOAN MALLORQUI FRANQUET

Others: Primer quadrimestre:
ALBERTO AGUASCA SOLE - 11
JORDI JOAN MALLORQUI FRANQUET - 11
JUAN MANUEL O'CALLAGHAN CASTELLA - 11
JORDI ROMEU ROBERT - 11

PRIOR SKILLS

Knowledgment in Antennas and Microwaves.

TEACHING METHODOLOGY

Being a laboratory course there are not formal lectures and learning is acquired through practice. Initially the assignments are guided and at the end more freedom of action are allowed to the students.

LEARNING OBJECTIVES OF THE SUBJECT

The student will learn how to design, characterize and measure the different devices that constitute a system that uses antennae and microwave circuits. From this knowledge, the student would face the integration of the different elements conforming the system as well as its characterization, validation and practical application.

STUDY LOAD

Type	Hours	Percentage
Hours small group	39,0	31.20
Self study	86,0	68.80

Total learning time: 125 h

CONTENTS

S1-3. Microwave circuits simulation with ADS

Description:
Simulation of passive, non-linear and active circuits.

Full-or-part-time: 9h
Laboratory classes: 9h

S4. Design and simulation of antennae with CST/Momentum

Description:
Perform antennae design with professional software.

Full-or-part-time: 3h
Theory classes: 3h

S5. Antenna Measurement

Description:
Demonstration of antennae measurement in the COMMSENSLAB anechoic chamber and application of the near-field to far-field transformations.

Full-or-part-time: 3h
Theory classes: 3h

P6. Vector Network Analyzer (VNA)

Description:
Characterize different microwave devices with a VNA. Be aware of the capabilities and limitations of the instrument.

Full-or-part-time: 3h
Theory classes: 3h

P7. Spectrum Analyzer (SA)

Description:
Characterize different microwave devices with a SA. Be aware of the capabilities and limitations of the instrument.

Full-or-part-time: 3h
Theory classes: 3h

P8. Noise figure measurements (NF)

Description:
Characterization of the microwave devices' behaviour in terms of noise with ad-hoc instrumentation.

Full-or-part-time: 3h
Theory classes: 3h

ASS. Design, assembling, test and valdation of systems

Description:
In groups of two or three, the students will design, build, characterize, and validate a radiofrequency system.

Full-or-part-time: 12h
Theory classes: 12h

GRADING SYSTEM

The marks are determinaed from the observations of the professor along the course, the previous work and results of each assignment, and the presentation of the final system selected by the students.
The weights for the final mark are:
- S1 to S5, P6 to P8 a 10% each.
- ASS. 20% (80% report, 20% oral presentation).