

Academic Year: ( 2020 / 2021 )

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Department assigned to the subject: Signal and Communications Theory Department

Coordinating teacher: FERNANDEZ-GETINO GARCIA, MARIA JULIA

Type: Electives ECTS Credits : 6.0

Year : 1 Semester : 1

## OBJECTIVES

The specific competences associated with this particular subject are indicated here:

- Know the options for the design of OFDM modulation and its variants.
- Know the new multi-antenna processing techniques for increasing diversity and capacity.
- Be able to solve practical problems of modulations and processing in broadband communications systems using analytical methods and simulation.

This subject will allow the student to:

- Know the options for the design of the OFDM modulation and OFDMA multiple access that allow to guarantee a certain quality of service.
- Know the new multi-carrier techniques (SC-FDMA, FBMC)
- Know the new multi-antenna techniques (MIMO, network MIMO, massive MIMO)
- Be able to solve practical problems on technologies for broadband communications using analytical methods and simulation.

## DESCRIPTION OF CONTENTS: PROGRAMME

- Topic 1: The new scenario of broadband communications.
- Topic 2: Multicarrier modulations and high spectral efficiency.
- Topic 3: Multi-antenna techniques.
- Topic 4: Practical cases in radiocommunication systems.

## LEARNING ACTIVITIES AND METHODOLOGY

To pass the subject, the student must perform a significant percentage of practical work. Realization of practical exercises (problems, works, presentations, laboratory practices) individually and in groups. Realization of a final work. As a result of this activity, a study or an application of a certain magnitude will be developed, accompanied by a brief scientific-technical report.

## ASSESSMENT SYSTEM

<b>% end-of-term-examination/test:</b>	0
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	100

The evaluation of the student will be carried out continuously:  
evaluate the theoretical and practical exercises carried out by the students, as well as presentations of class work.

The final grade in the extraordinary call will consist of an exam plus the presentation of the practical exercises and the final work.

## BASIC BIBLIOGRAPHY

- Harri Holma, Antti Toskala LTE for UMTS: Evolution to LTE-Advanced, Wiley, 2011

- Ye Geoffrey Li, Gordon L. Stuber Orthogonal Frequency Division Multiplexing for Wireless Communications, Springer US, 2006