Technologies and architectures for the new terrestrial and space communications

Academic Year: (2021 / 2022) **Review date: 01-06-2021**

Department assigned to the subject: Signal and Communications Theory Department

Coordinating teacher: STEFANOVIC , CASLAV

Type: Electives ECTS Credits : 6.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

There are no specific requirements for this subject.

OBJECTIVES

CB6, CB7, CB9, CB10

CG1, CG5

CE1, CE2, CE3, CE4, CE5, CE6, CE12

Additionally, the specific competences associated with this particular subject are indicated here:

- Know the main digital modulation schemes and radio access techniques

- Know how to carry out the high level design of a digital radio communications system and issue critical judgments about the suitability of each of the subsystems.

This subject will allow the student to know the following contents:

- Global vision of radio communication systems for terrestrial and space applications.
- Architectures and key technologies in radio communications systems.
- Modulation formats and most suitable receivers for different types of channels.

DESCRIPTION OF CONTENTS: PROGRAMME

This subject presents a global vision of the radiocommunication systems, presenting the architectures and key technologies and how these are integrated into the new communication systems, both terrestrial and spatial.

Topic 1: Introduction to radiocommunication systems: link balance, architectures and quality of service.
Topic 2: Modulations and access techniques.
Topic 3: Terrestrial communication systems.
Topic 4: Space communication systems.

LEARNING ACTIVITIES AND METHODOLOGY

The following training activities are included:
AF1 Theoretical practical classes
AF2 Laboratory practices
AF3 Tutorials
AF4 Group work
AF5 Individual student work
AF6 Partial and final exams

ASSESSMENT SYSTEM

The subject is evaluated from:
- Block-content exams
- Individual or group assignment carried out during the course
- Final exam

The assessment of the extraordinary evaluation is based on a final exam.

% end-of-term-examination:	0
% of continuous assessment (assigments, laboratory, practicals…):	100

BASIC BIBLIOGRAPHY

- Erik Dahlman Stefan Parkvall Johan Skold 5G NR: The Next Generation Wireless Access Technology, Academic Press, 2018
- G. Maral, M. Bousquet "Satellite communications systems: systems, techniques and technology", John Wiley & Sons, 1998
- H. Holma And A. Toskala ¿LTE for UMTS: Evolution to LTE-Advanced¿, John Wiley & Sons, 2011
- Rappaport, Teodore S "Wireless Communications", Prentice Hall, 1996

BASIC ELECTRONIC RESOURCES

- . 3GPP Specifications: http:// http://www.3gpp.org/specifications
- . 3GPP Releases: http://www.3gpp.org/Releases