60928 - Mobile communication networks and services

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	533 - Master's Degree in Telecommunications Engineering
ECTS	5.0
Course	1
Period	Second semester
Subject Type	Compulsory
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The teaching-learning methodologies to be undertaken to achieve the proposed learning results are as follows:

Participatory lecture (42 hours). Presentation by the teacher of the main contents of the subject, combined with the active participation of students. This activity will take place in the classroom in person. This methodology, supported with the individual student's study is designed to provide students with the theoretical foundations of the subject content.

Problem-based learning sessions in the classroom (8 hours). Problem solving and practical cases proposed by the

teacher, with the possibility of exposing them by students individually or in groups authorized by the teacher. This activity will take place in the classroom in person, and may require preparatory work by students.

Tutored practical works (28 hours). This activity will advance all proposed learning outcomes. Follow-up sessions will be conducted by the teacher in which each student will present their work.

Personalized attention to students through tutorials.

Assessment tests.

Personal work of the student .

5.2.Learning activities

1 Theoretical/practical sessions in the classroom practices, whose main contents are organized as described in detail in the next section.

2. Tutored practical work aimed at solving practical cases analysis, design, dimensioning and planning of access networks by applying techniques and procedures seen in theoretical and problem sessions. The evolution of the work will be presented periodically to the teacher and an explanatory final report of solving methodology followed by the student and justification of the proposed solution will be delivered.

5.3.Program

Block 0. Introduction

- *Course presentation.*
- *Evolution of mobile communication sector. Evolution of the air interface of cellular communication systems toward 4G. Key features of 4G systems. Standardisation activities.*

Block 1. 4G mobile networks and evolution

- *LTE Architecture Reference Model: Radio Access Network and Evolved Packet Core Network. Functional elements, interfaces and protocols. QoS and IMS subsystems.*
- *Radio interface. Overall functional split, radio protocol architecture. Services, functions and main procedures.*
- *Heterogeneous network deployments. Key Design Features*
- *Multi-RAN deployments.*

Block 2. Resource management.

- *Radio Resource m anagement.*
- *Dimensioning, planning and optimization of mobile communication networks.*

5.4.Planning and scheduling

The schedule of the course will be defined by the EINA in the academic calendar of the corresponding course.

5.5.Bibliography and recomended resources

- Agustí, Ramón. LTE: Nuevas Tendencias en Comunicaciones Móviles / Ramón Agusti, Francisco Bernardo, Fernando Casadevall, Ramon Ferrús, Jordi Pérez-Romero, Oriol Sallent Fundación Vodafone España. 2010
- Cox, Christopher. An introduction to LTE : LTE, LTE-advanced, SAE and 4G mobile communications / Christopher

60928 - Mobile communication networks and services

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- kreher, Ralf. LTE Signaling, Troubleshooting and Optimization / Ralf Kreher, Karsten Gaenger John Wiley & Sons, 2011
- Holma, Harri. LTE for UMTS Evolution to LTE-Advanced / Harri Holma and Antti Toskala. - 2nd ed. John Wiley & Sons, 2011
- Hämäläinen, Seppo. LTE self-organising networks (SON) : network management automation for operational efficiency / Seppo Hämäläinen, Henning Sanneck, Cinzia Sartori John Wiley & Sons, 2012
- Rumney, Moray. LTE and the Evolution to 4G Wireless Design and Measurement Challenges / Moray Rumney. - 2nd ed. John Wiley & Sons, 2013.
- Dahlman, Erik. 4G: LTE/LTE-Advanced for Mobile Broadband / Erik Dahlman, Stefan Parkvall, Johan Sköld. - Second Edition Elsevier, 2014.
- Ahmadi, Sassan. LTE-Advanced: A Practical Systems Approach to Understanding the 3GPP LTE Releases 10 and 11 Radio Access Technologies / Sassan Ahmadi Elsevier, 2014.
- http://www.3gpp.org/