Program	09TT- Engineering in Telecommunication Technologies and Services

Course number and name	
Number	95000044
Name	Mobile Communications Comunicaciones Móviles
Semester	Y4-S8

Credits and contact hours	
ECTS Credits	6
Contact hours	60

Coordinator's name	Luis Mendo

Specific course information

Description of course content

This course will allow the students to understand the fundamentals of mobile communication systems, particularly their radio interface; and will provide them with detailed knowledge about how current mobile communication technologies work (second-, third- and fourth-generation). In addition, the students will learn to use radio interface monitoring and measurement tools as used in current networks and interpret their ouputs.

List of topics to be covered

1. Introduction
2. Fundamentals of the radio interface in mobile communications
3. Propagation in mobile communications
4. Classic (FDMA/TDMA) systems
5. GSM system
6. GPRS system
7. CDMA cellular systems
8. UMTS system
9. Techniques used in evolved Third-Generation systems
10. HSDPA system
11. HSUPA system
12. LTE system

Prerequisites or co-requisites

The student should have solid knowledge on probability theory, communication theory, and radio communications

Course category in the program

__ R (required)	__ E (elective)	_X_ SE (selective elective)

Specific goals for the course
Specific outcomes of instruction
RA1: To understand the fundamentals of mobile communication systems RA2: To understand the main techniques and the basic aspects of the radio interface in mobile communications RA3: To know the characteristics of radio wave propagation in mobile communications and their impact on how these systems work and are designed RA4: To know how the different types of cellular networks operate RA5: To know the specifications and functioning of the most representative Second-Generation, Third-Generation and Fourth-Generation systems RA6: To be able to use radio interface monitoring tools as used in current mobile communication systems RA7: To be able to learn autonomously RA8: To have creativity skills in technical aspects related to this course
Student outcomes addressed by the course
CE-ST1, CE-ST2, CE-ST5

Bibliography and supplemental materials
Bibliography: José María Hernando. *Comunicaciones Móviles*. Editorial Universitaria Ramón Areces, second edition, 2004. D. Tse, P. Viswanath. *Fundamentals of Wireless Communication*. Cambridge University Press, 2005. Erik Dahlman, Stefan Parkvall, Johan Sköld, Per Beming. *3G Evolution. HSPA and LTE for Mobile Broadband*. Academic Press, second edition, 2008. Erik Dahlman, Stefan Parkvall, Johan Sköld. *4G. LTE/LTE-Advanced for Mobile Broadband*. Academic Press, second edition, 2014. Oriol Sallent, Jordi Pérez. *Fundamentos de diseño y gestión de sistemas de comunicaciones móviles celulares*. Iniciativa Digital Politécnica, 2014. Harri Holma, Anti Toskala (editors). *WCDMA for UMTS*. John Wiley and sons, fifth edition, 2010. Web resources: Moodle site of this course: http://moodle.upm.es/titulaciones/oficiales

Teaching methodology			
_X_ **lectures**	_X_ **problem solving sessions**	__ **collaborative actions**	_X_ **laboratory sessions**
Other:			