

Program	09AQ-Master in Telecommunication Engineering
----------------	---

Course number and name	
Number	93000793
Name	Radio Access Technologies Tecnologías de Acceso Radio
Semester	Y1- S1

Credits and contact hours	
ECTS Credits	3
Contact hours	30

Coordinator's name	José Manuel Riera Salís
---------------------------	-------------------------

Specific course information		
Description of course content		
<p>The course is focused on Radio Access Technologies, with emphasis on wireless technologies such as Wi-Fi and WiMAX and less dedication to mobile communications. Basic technical aspects are reviewed in the first part, to continue with a brief description of mobile communication systems and a more detailed study of WLAN, WMAN and WRAN technologies, including the recent advances in cognitive radio.</p>		
List of topics to be covered		
<ol style="list-style-type: none"> 1. Introduction to Radio Access Technologies and Regulation. 2. Radiocommunications basics. 3. Technical fundamentals of Radio Access Technologies. 4. Mobile communication systems. 5. Wireless LAN. Wi-Fi. 6. Wireless MAN and RAN. 7. Short-range wireless technologies. 		
Prerequisites or co-requisites		
None		
Course category in the program		
<input checked="" type="checkbox"/> R (required)	<input type="checkbox"/> E (elective)	<input type="checkbox"/> SE (selective elective)

Specific goals for the course

Specific outcomes of instruction

RA1: To learn the basic aspects of radiocommunications systems and services, regulation and technical standards.

RA2: To be able to describe a radio link with regards to the most relevant technical parameters of transmitter and receiver and propagation characterization.

RA3: To understand the advanced techniques used in Radio Access Technologies, such as adaptive modulation and coding, MIMO and other.

RA4: To learn the basic aspects of the mobile communications systems and short-range technologies.

RA5: To know the most relevant wireless technologies used in local, metropolitan and regional areas, including the technical standards and recent advances in cognitive radio.

Student outcomes addressed by the course

CG1 – CG6, CT1 – CT6, CE1, CE2, CE4, CE6

Bibliography and supplemental materials

- IEEE 802 Standards, available through UPM network or VPN connection.
- ITU-R Recommendations, freely available at <http://www.itu.int>.
- J.M. Hernando, J.M. Riera, L. Mendo, “Transmisión por radio”, Ed. Ramón Areces, 7ª Ed., 2013.
- B. O’Hara, A. Petrick, “IEEE 802.11 Handbook”, IEEE Press, 2005.
- E. Perahia, R. Stacey, “Next Generation Wireless LANs”, Cambridge University Press, 2008.
- L. Nuaymi, “WiMAX Technology for Broadband Wireless Access”, Wiley, 2007.
- M. D. Katz, F.H. Fitzek, “WiMAX Evolution. Emerging Technologies and Applications, Wiley, 2009.
- Web access to course contents: <http://moodle.upm.es/titulaciones/oficiales>
- Ekahau ESS tool for wireless LAN analysis.

Teaching methodology

<input checked="" type="checkbox"/> lectures	<input type="checkbox"/> problem solving sessions	<input type="checkbox"/> collaborative actions	<input checked="" type="checkbox"/> laboratory sessions
Other: Presentations given by the students to the group, in Spanish or English.			