

<b>Program</b>	<b>09TT- Engineering in Telecommunication Technologies and Services</b>
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<b>Course number and name</b>	
<b>Number</b>	95000035
<b>Name</b>	Radiation and Wave Propagation Radiación y Propagación
<b>Semester</b>	Y3-S5

<b>Credits and contact hours</b>	
<b>ECTS Credits</b>	3
<b>Contact hours</b>	30

<b>Coordinator's name</b>	Manuel Sierra Castañer
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<b>Specific course information</b>		
<b>Description of course content</b>		
This course is an introduction to Radiation and Wave Propagation. The course covers the fundamentals of electromagnetic radiation, wave propagation, antenna parameters and main characteristics of typical antennas.		
<b>List of topics to be covered</b>		
<ol style="list-style-type: none"> <li>1. Definition and Fundamentals of antennas.</li> <li>2. Basic Parameters of Antennas.</li> <li>3. Introduction to wave propagation.</li> <li>4. Linear antennas.</li> <li>5. Array and aperture antennas.</li> </ol>		
<b>Prerequisites or co-requisites</b>		
Electromagnetics, Electromagnetic fields, Circuit design,		
<b>Course category in the program</b>		
<input checked="" type="checkbox"/> <b>R (required)</b>	<input type="checkbox"/> <b>E (elective)</b>	<input type="checkbox"/> <b>SE (selective elective)</b>

<b>Specific goals for the course</b>	
<b>Specific outcomes of instruction</b>	
RA1: Knowledge of the physical phenomena of wave radiation. RA2: Knowledge of antenna parameters and transmission equation. RA3: Knowledge of fundamentals of antennas. RA4: Knowledge of main models of wave radio-propagation.	

**Student outcomes addressed by the course**

CG1-6, CG7, CG9, CG12, CECT4, CECT5, CECT8

**Bibliography and supplemental materials**

“Radiación y Propagación”. Manuel Sierra Castañer. J.L. Besada Sanmartín, L. De Haro Ariet. Julio 2004. ETSI Telecomunicación. Universidad Politécnica de Madrid.

“Antenas”. Ángel Cardama, Lluís Jofre, Juan Manuel Rius, Jordi Romeu, Sebastián Blanch Edicions UPC 1993, 1998 y 2002.

“Antennas. For All Applications”. J. D. Kraus. R. J. Marhefka. McGraw Hill. 3<sup>rd</sup> edition. 2002

"Radio Wave Propagation" J. Griffiths. Prentice Hall Int. 1987

"Antenna Theory. Analysis and Design" Constatine Balanis John Wiley & Sons 1982 y 1997

"Antenna Theory and Design". W.L. Stutzman Wiley. 1981 y 2001

"Antennas and Radiowave Propagation". Robert E. Collin Mc Graw-Hill. 1985

**Teaching methodology**

<b>X lectures</b>	<b>X problem solving sessions</b>	<b>— collaborative actions</b>	<b>— laboratory sessions</b>
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**Other:** On-line exercises.