

Program	09TT- Engineering in Telecommunication Technologies and Services
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Course number and name	
Number	95000042
Name	Digital Communications Transmisión Digital
Semester	Y4 - S7

Credits and contact hours	
ECTS Credits	6
Contact hours	60

Coordinator's name	José Ignacio Ronda Prieto
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Specific course information		
Description of course content		
The course provides a comprehensive introduction to the most important digital modulation techniques and the basic concepts behind them, with emphasis in modern techniques that are able to deal with time-varying channels..		
List of topics to be covered		
<ol style="list-style-type: none"> 1. Optimal receivers 2. Performance analysis of digital modulations 3. Digital modulations with memory 4. Coding 5. Equalization 6. Multicarrier modulations 7. CDMA 8. MIMO systems 		
Prerequisites or co-requisites		
Signals and Systems, Random Signals, Communications Theory, Information Theory, Digital Signal Processing, Transmission systems		
Course category in the program		
<input type="checkbox"/> R (required)	<input type="checkbox"/> E (elective)	<input checked="" type="checkbox"/> SE (selective elective)

Specific goals for the course	
Specific outcomes of instruction	
RA1: To know the basic architecture and performance measures of a communications	

system..

RA2: To know the methodology of basic linear and nonlinear modulations.

RA3: To know the fundamentals of channel coding.

RA4: To know the basic techniques for the detection of modulations with memory.

RA5: To be acquainted with the basic channel equalization techniques.

RA6: To know the basic aspects of OFDM modulation.

RA7: To know the technique of direct-sequence modulation spread-spectrum.

RA8: To be acquainted with the fundamentals of the communication wity multiple antennas.

RA9: To know the fundamentals of MIMO point-to-point communication.

Student outcomes addressed by the course

CECT1, CECT4, CECT5, CECT6

CG1, CG2, CG5, CG6, CG9, CG10

Bibliography and supplemental materials

Course notes

Course slides

Matlab-based experiments

Recomended bibliography:

- A. Artés Rodríguez, F. Pérez González. “Comunicaciones Digitales”. Prentice-Hall. 2007 (disponible en www.tsc.uc3m.es/~antonio/libro_comunicaciones/)
- J. R. Barry, E. A. Lee, D.G. “Messerschmitt. Digital Communication”. Springer. 2004
- J. Proakis, M. Salehi. “Digital Communications”. Mc Graw-Hill, 2007

Teaching methodology

<input checked="" type="checkbox"/> lectures	<input checked="" type="checkbox"/> problem solving sessions	<input type="checkbox"/> collaborative actions	<input type="checkbox"/> laboratory sessions
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Other: