

Program	09TT- Engineering in Telecommunication Technologies and Services
----------------	---

Course number and name	
Number	95000028
Name	Digital Signal Processing Tratamiento Digital de Señales
Semester	Y3-S5

Credits and contact hours	
ECTS Credits	6
Contact hours	60

Coordinator's name	Juan Gómez Mena
---------------------------	-----------------

Specific course information		
Description of course content		
<p>The aim of this course is to train the future engineer in the basics of Digital Signal Processing:</p> <ul style="list-style-type: none"> -Sampling of continuous signals as a gateway to the discrete world. -Study and implementation of rational discrete systems, commonly called digital filters. -Analysis and design transformed domains, with emphasis on spectral analysis. -Exhibition of the latest in signal processors and converters A/D and D/A technological advances. 		
List of topics to be covered		
1. Introduction to discrete-time signals and systems, 2. Sampling of continuous-time signals, 3. Digital filters, 4. The Discrete Fourier Transform, 5. Spectral analysis.		
Prerequisites or co-requisites		
Calculus, Vector analysis, Random signals and Signals and Systems.		
Course category in the program		
<u>X</u> R (required)	__ E (elective)	__ SE (selective elective)

Specific goals for the course
Specific outcomes of instruction
RA1: To understand the fundamentals and applications of transform analysis.
RA2: To know the theorems and concepts related to sampling of continuous signals and sampling rate changes using digital techniques.
RA3: To analyze, design and implement digital filters. To know the basic structures for

IIR and FIR filters and represent them by flowcharts. Knowing the effects of quantization of filter coefficients.
 RA4: To know digital signal processing devices: FPGAs and DSP and reference manufacturers.
 RA5: To know the DFT and its applications, as well as a fast calculation algorithm and DCT.
 RA6: To know the basic techniques of spectral analysis.

Student outcomes addressed by the course

CECT1, CECT4, CECT5
 CG1, CG2, CG4, CG5, CG6, CG9

Bibliography and supplemental materials

A. V. Oppenheim, R.W. Schaffer, "Discrete-Time Signal Processing". Prentice-Hall, 3rd Ed, 2010.
 G. Proakis, D. G. Manolakis, "Digital Signal Processing". Prentice Hall, 4th Ed, 2007.
 Sanjit K. Mitra, "Digital Signal Processing". A Computer-Based Approach. Mc Graw-Hill, 4th Ed, 2011.
 McClellan, Burrus, Oppenheim, Parks, Schaffer and Schuessler, "Computer-Based Exercises for SIGNAL PROCESSING Using MATLAB 5". Prentice Hall, 1998.

Teaching methodology

<u> </u> X lectures	<u> </u> X problem solving sessions	<u> </u> X collaborative actions	<u> </u> X laboratory sessions
Other:			