



## Course guides

# 230088 - SSIS - Signals and Systems

**Last modified:** 29/04/2020

**Unit in charge:** Barcelona School of Telecommunications Engineering  
**Teaching unit:** 739 - TSC - Department of Signal Theory and Communications.

**Degree:** BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Compulsory subject).

**Academic year:** 2020    **ECTS Credits:** 6.0    **Languages:** Catalan, Spanish

### LECTURER

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**Coordinating lecturer:** Salavedra Moli, Josep

**Others:**

FRANCESC VALLVERDÚ BAYÉS - ANTONI GASULL LLAMPALLAS - JOSEP SALAVEDRA MOLI -  
M. ASUNCION MORENO BILBAO - ELISA SAYROL CLOLS - CLIMENT NADEU CAMPRUBI -  
FRANCESC REY MICOLAU

### REQUIREMENTS

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MATEL

### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Generical:**

12 CPE N2. They will be able to identify, formulate and solve engineering problems in the ICC field and will know how to develop a method for analysing and solving problems that is systematic, critical and creative.

### TEACHING METHODOLOGY

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Theoretical classes as well as practical ones using Matlab

### LEARNING OBJECTIVES OF THE SUBJECT

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Signals and systems in the time and frequency domains

### STUDY LOAD

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Type	Hours	Percentage
Hours large group	52,0	34.67
Self study	85,0	56.67
Hours small group	13,0	8.67

**Total learning time:** 150 h



## CONTENTS

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### 1. Introduction. Signals and systems in the time domain

**Description:**

Time-domain Signal Processing

**Full-or-part-time:** 36h

Theory classes: 12h

Laboratory classes: 4h

Self study : 20h

### 2. Signals and systems in the frequency domain. The Fourier Transform

**Description:**

Fourier Transform of analog signals and systems. Sampling Theorem.

**Full-or-part-time:** 54h

Theory classes: 20h

Laboratory classes: 4h

Self study : 30h

### 3. Fourier Transform of discrete-time signals. DFT

**Description:**

Fourier Transform of discrete-time signals. Discrete Fourier Transform (DFT)

**Full-or-part-time:** 42h

Theory classes: 14h

Laboratory classes: 4h

Self study : 24h

### 4. Correlation function. Power Spectrum.

**Description:**

Correlation function and power spectrum.

**Full-or-part-time:** 16h

Theory classes: 4h

Laboratory classes: 1h

Self study : 11h

## GRADING SYSTEM

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Continuous assessment (40%)

Final exam (60%)

Students with an excellent continuous assessment are eligible to do not take the final exam and completing the course evaluation with a specific activity.



## BIBLIOGRAPHY

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### Basic:

- Sayrol, E. [et al.]. Senyals i sistemes analògics: una introducció pràctica [on line]. 2a ed. Barcelona: Edicions UPC, 2002 [Consultation: 17/03/2015]. Available on: <http://hdl.handle.net/2099.3/36511>. ISBN 8483016109.
- García de Jalón, J.; Rodríguez, J.I. Aprende Matlab 7.0 como si estuviera en primero [on line]. Madrid: Universidad Politécnica de Madrid. Escuela Técnica Superior de Ingenieros Industriales, 2005 [Consultation: 07/07/2020]. Available on: <http://ocw.uniovi.es/file.php/146/T4MaterClase/MATLAB/matlab70primero.pdf>.
- Haykin, S. S.; Van Veen, B. Señales y sistemas. Mexico D.F: Limusa, 2001. ISBN 9681859146.
- Mariño, J.B.; Vallverdú, F.; Rodríguez, J.A.; Moreno, A. Tratamiento digital de la señal: una introducción experimental [on line]. 3a ed. Barcelona: Edicions UPC, 1999 [Consultation: 19/02/2015]. Available on: <http://hdl.handle.net/2099.3/36344>. ISBN 8483012928.

### Complementary:

- Roberts, M.J. Señales y sistemas: análisis mediante métodos de transformada y MATLAB. México: McGraw Hill, 2005. ISBN 9701050673.
- Oppenheim, A.V.; Willsky, A.S. Señales y sistemas. 2a ed. México: Prentice-Hall Hispanoamericana, 1997. ISBN 970170116X.