Course guide
230088 - SSIS - Signals and Systems

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: 2022  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER
Coordinating lecturer: Consultar aquí / See here:
https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura

Others: Consultar aquí / See here:
https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma

REQUIREMENTS
LINEAR CIRCUITS AND SYSTEMS - Precorequisite
MATHEMATICS FOR TELECOMMUNICATIONS - Prerequisite

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUDES

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
Theoretical classes as well as practical ones using Matlab

LEARNING OBJECTIVES OF THE SUBJECT
Signals and systems in the time and frequency domains

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>52,0</td>
<td>34.67</td>
</tr>
<tr>
<td>Hours small group</td>
<td>13,0</td>
<td>8.67</td>
</tr>
<tr>
<td>Self study</td>
<td>85,0</td>
<td>56.67</td>
</tr>
</tbody>
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Total learning time: 150 h
## CONTENTS

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

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

Basic:

Complementary: