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

## Course number and name
<table>
<thead>
<tr>
<th>Number</th>
<th>95000015</th>
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</thead>
<tbody>
<tr>
<td>Name</td>
<td>Signals and Systems</td>
</tr>
<tr>
<td></td>
<td>Señales y Sistemas</td>
</tr>
<tr>
<td>Semester</td>
<td>Y2-S3</td>
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## Credits and contact hours
<table>
<thead>
<tr>
<th>ECTS Credits</th>
<th>6</th>
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<tbody>
<tr>
<td>Contact hours</td>
<td>68</td>
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</table>

## Coordinator's name
Gonzalo de Miguel Vela

## Specific course information

### Description of course content
The program covers basics aspects of signal and system analysis, in continuous time and in discrete time. Taking as starting point the basics and mathematical tools known at the beginning of the second course, the main new concepts presented are: linear and time invariant systems characterization using the impulse response, convolution, continuous and discrete time Fourier Transform, and signal and system analysis in the transform domain (Laplace an Z transforms). All these concepts will be used in the remaining subjects of this career.

### List of topics to be covered
- Analysis of signals and systems in time domain (basic concepts, linear systems, impulse response, convolution and systems defined by linear differential or difference equations)
- Analysis of continuous-time signals and systems in transformed domain (Fourier series and transforms, Laplace transform and linear system analysis)
- Analysis of discrete-time signals and systems in transformed domain (Fourier series and transforms, Z transform and linear system analysis)
- Sampling (sampling theory, discrete time implementation of continuous systems)
- Introduction to MATLAB as a basic tool for signal processing

### Prerequisites or co-requisites
It is assumed students have studied Calculus and Algebra

### Course category in the program
| X | R (required) | E (elective) | SE (selective elective) |
Specific goals for the course

Specific outcomes of instruction
RA 1: To know the basics concepts o signals and system analysis
RA 2: To be proficient in the analysis of signals and systems (continuous and discrete time) using transforms (Fourier, Laplace, Z)
RA 3: To known the theory of signal sampling and digital implementation of continuous systems
RA 4: To have a first contact with a signal processing laboratory

Student outcomes addressed by the course
CEB1, CEB4
CG1, CG2, CG5

Bibliography and supplemental materials

Teaching methodology

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Problem solving sessions</th>
<th>Collaborative actions</th>
<th>Laboratory sessions</th>
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</thead>
<tbody>
<tr>
<td>X</td>
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Other: