Course guide

230085 - MATEL - Mathematics for Telecommunications

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 749 - MAT - Department of Mathematics.

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

Academic year: 2023 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

PRIOR SKILLS

Basic Calculus, Linear Algebra

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:
07 AAT N1. SELF-DIRECTED LEARNING - Level 1. Completing set tasks within established deadlines. Working with recommended information sources according to the guidelines set by lecturers.

TEACHING METHODOLOGY

Expository instruction/Master class

LEARNING OBJECTIVES OF THE SUBJECT

The main goal of the subject is the study of the main transforms, the Fourier Series and their applications to solving ordinary differential equations and systems, and some partial differential equations (like the one-dimensional wave equation). The contents of this subject is well connected to the other subjects about linear circuits and signal processing, including as well the basic concepts about differential equations needed in other subjects related to electronics and electromagnetism.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>65,0</td>
<td>43.33</td>
</tr>
<tr>
<td>Self study</td>
<td>85,0</td>
<td>56.67</td>
</tr>
</tbody>
</table>

Total learning time: 150 h
## CONTENTS

### Laplace Transform

**Description:**

**Full-or-part-time:** 12h
**Theory classes:** 12h

### Introduction to ordinary differential equations

**Description:**

**Full-or-part-time:** 12h
**Theory classes:** 12h

### Fourier Series

**Description:**

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

### Fourier Transform

**Description:**

**Full-or-part-time:** 12h
**Theory classes:** 12h

### z Transform

**Description:**

**Full-or-part-time:** 13h
**Theory classes:** 13h

### GRADING SYSTEM

Short partial exams for continuous evaluation (40%). Final exam (60%). The final grade will be the maximum between the grade obtained with continuous evaluation or the one obtained with 100% of the final exam.
BIBLIOGRAPHY

Basic:

Complementary: