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: 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

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>
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</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>
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</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: