

Academic Year/course: 2021/22

## 30372 - Mathematics for Telecommunications

### Syllabus Information

**Academic Year:** 2021/22

**Subject:** 30372 - Mathematics for Telecommunications

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

**Degree:** 581 - Bachelor's Degree in Telecommunications Technology and Services Engineering

**ECTS:** 6.0

**Year:** 1

**Semester:** Second semester

**Subject Type:** Compulsory

**Module:**

### 1. General information

### 2. Learning goals

### 3. Assessment (1st and 2nd call)

### 4. Methodology, learning tasks, syllabus and resources

#### 4.1. Methodological overview

The learning process that has been designed for this subject is based on the following:

Continuous work of the student; study of the theory using the provided notes and the bibliography; realization of problems and exercises; query and resolution of doubts.

Master classes in which the contents will be developed, illustrating them with examples and counter-examples sufficient to facilitate their comprehension; exercises in group will be carried out.

Practices in which, with the help of the computer, problems on different questions will be solved and numerical methods will be implemented using software.

Sessions of problems in which, in a participative way, problems that demand the comprehension of the concepts and the relations between concepts and techniques of the different subjects will be solved.

#### 4.2. Learning tasks

The program offered to the student to help him achieve the expected results includes the following activities:

Type I: Master class (42 hours). Three hours by week will be devoted to theory and problem classes. These will be master classes in which the contents and theoretical results will be presented, complemented with the resolution of problems and practical exercises with an active participation of the student.

Type II: Problem's classes (6 hours). Models will be presented to students, with problems and exercises, in which some of the mathematical aspects appear of the subject. Some of them will be solved in class and others will serve as autonomous work material recommended for the student.

Type III: Practical classes (6 sessions of 2 hours each). With the students distributed in three subgroups, they will be developed in the classroom and schedule set by the center. In these sessions the students will use software to perform the proposed exercises.

#### 4.3. Syllabus

Unit 1. Linear Differential Equations.

Unit 2. The Laplace Transform.

Unit 3. Applications of Differential Equations in Telecommunication.

Unit 4. Fourier Series.

Unit 5. Fourier Transform.

Unit 6. Application to Partial Differential Equations.

Unit 7. Applications of Fourier Methods in Telecommunication.

#### **4.4. Course planning and calendar**

Master classes and problems in the classroom and laboratory sessions are taught according to the schedule established by the center (available on their website).

Each professor will inform about his tutoring schedule.

The rest of the activities will be planned according to the number of students and will be announced in advance.

The information will be available at <http://add.unizar.es>

#### **4.5. Bibliography and recommended resources**

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=30372>