

30158 - Communication Theory

Syllabus Information

Academic Year: 2020/21

Subject: 30158 - Communication Theory

Faculty / School: 179 - Centro Universitario de la Defensa - Zaragoza

Degree: 457 - Bachelor's Degree in Industrial Organisational Engineering
563 - Bachelor's Degree in Industrial Organisational Engineering

ECTS: 6.0

Year: 4

Semester: First semester

Subject Type: Optional

Module: ---

1.General information

1.1.Aims of the course

The subject Communication Theory makes students know and be able to analyse different aspects related to communication systems. In order to achieve this, the main objectives can be summarized as follows:

- To describe the basic aspects of communication systems.
- To characterize the three main parts of a communication system: transmitter, channel and receiver.
- To describe the properties of information signals and its perturbations (noise, distortion, etc.).
- To perform the analysis of signals and systems in a communication system.

To know the most significant digital modulations, their properties and mathematical expressions.

1.2.Context and importance of this course in the degree

The subject is part of the Communication Systems speciality of Industrial Organization Engineering and it is essential for the students to become part of the Transmissions Branch within the Spanish Army, thus integrating it in the training in the corresponding fundamental speciality.

1.3.Recommendations to take this course

The subject is mainly theoretical, thus making attendance to theoretical sessions with an active participation is highly recommended. Previous knowledge required to be able to properly follow the subject are basic concepts of complex numbers, integrals, electronics and Laplace transform.

2.Learning goals

2.1.Competences

- Ability to plan, budget, organise, manage and monitor tasks, people and resources.
- Ability to solve problems and take decisions with initiative, creativity and critical reasoning.
- Ability to communicate knowledge and skills in Spanish.
- Ability to work in a multidisciplinary group and in a multilingual setting.
- Ability to continue learning and develop self-learning strategies.
- Knowledge of the working principles and applications of the basic methods and systems for transmitting information, and description of the techniques of analog and digital modulation.

2.2.Learning goals

In order to successfully pass the subject, the students will have to show that they are able to:

1. Describe the working principles and applications of the basic methods and systems for transmitting information.
2. Describe the techniques of analog and digital modulation.

2.3.Importance of learning goals

The learning goals are essential to successfully pass the rest of subjects of the Transmissions fundamental speciality, since they are key to understand the basic principles of any communication system. Furthermore, the most significant digital modulation techniques used in real communication systems are presented.

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

The student should reach the learning goals by passing the following assessments:

- Midterm exam about multiple-choice theoretical and practical questions and problem-solving questions from lessons 1-3 of the subject (35%)
- Final exam about multiple-choice theoretical and practical questions and problem-solving questions from lessons 4 and 5 of the subject (45%)
- Continuous assessments during all the semester with autonomous and group work, and laboratory sessions (20%)

In order to pass the subject it is necessary to obtain, at least, a score of 4 (maximum is 10) in both written exams. If a student does not obtain that score in the midterm exam, they could do an exam about the lessons 1-3 in the final exam.

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

If this teaching could not be done in person for health reasons, it would be done telematically.

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

- The presentation of the theoretical contents in lectures.
- The resolution of problems.
- Personal study by students.
- Practical teaching in laboratories where students must apply their theoretical knowledge in practical situations.
- Development of individual or in-group works.

4.2.Learning tasks

The main learning activities are:

- The presentation of the theoretical contents in lectures and the resolution of theoretical problems and practical cases by the students.
- Laboratory sessions.
- Individual or in-group works.

4.3.Syllabus

The course will address the following topics:

1. Introduction
2. Random signals and noise
3. The Transmission channel
4. Analog Modulation Techniques
5. Base Band Digital Transmission
6. Digital Modulation Techniques

4.4.Course planning and calendar

The planning and scheduling of lectures and practical sessions will be announced by the teachers, both in class and at the Moodle platform.

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=30158&year=2020