

## 30172 - Defence technologies

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 30172 - Defence technologies

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

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

**ECTS:** 4.5

**Year:** 3

**Semester:** First semester

**Subject type:** Compulsory

**Module:**

### 1. General information

This course is aimed at contributing to the formation of Army officers in terms of telecommunication systems and Nuclear-Biological-Chemical (NBC) defense.

#### Main objectives:

- Basic notions and general aspects of telecommunications.
- Structure of telecommunication networks.
- Working principles of telecommunication networks.
- Scientific and technological aspects of NBC risk and protection.

These objectives are in line with some of the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (<https://www.un.org/sustainabledevelopment/>), in such a way that the acquisition of the course learning outcomes provides training and competence to contribute to their achievement to some degree.

### 2. Learning results

1. The student understands the operation of simple telecommunication systems and the main modes of radio propagation.
2. The student recognises and identifies the most common civil telecommunication systems.
3. The student recognises and identifies the most common military telecommunication systems.
4. The student acquires the scientific fundamentals of NBC weapons.
5. The student describes the organisation of NBC defense in small units, as well as the NBC equipment in a Company-type unit.
6. The student makes predictions of areas contaminated by nuclear attack or chemical-biological agents, and applies the principles of prevention, protection and control to these attacks.
7. The student has a general knowledge of the use of NBC weapons in land battle.
8. The student acts as the officer in charge of the NBC control core of a company-type unit.
9. The student applies safety rules in the use of weapon systems.

### 3. Syllabus

#### TELECOMMUNICATIONS PART

- Topic 1. Introduction to telecommunications systems.
- Topic 2. Signals in a telecommunication system.
- Topic 3. Modulation and multiplexing.
- Topic 4. Wired transmission media.
- Topic 5. Propagation of electromagnetic waves.
- Topic 6. Telecommunications networks.

#### NBC PART

- Topic 1. Nuclear and radiological risk.
- Topic 2. Chemical risk.
- Topic 3. Biological risk.
- Topic 4. Detection and identification.
- Topic 5. Protection and decontamination.

### 4. Academic activities

The learning process designed for the subject combines the following elements:

- **Theoretical-practical classes** that allow transmitting knowledge to the student, encouraging their participation. In these classes practical cases will be solved and theory will be taught, with or without an explicit separation between both.
- **Personalized attention** either in small groups or individualized in the tutorials.
- **Continuous personal work by the student** since the beginning of the course.
- **Assessment tests.**

## 5. Assessment system

### Continuous evaluation procedure

The next tests will be carried out:

**1. Telecommunications exam (ExTel).** Weight 55%.

**2. NBC Defense exam (ExNBC).** Weight 45%.

In both tests, students must demonstrate their knowledge and ability to apply the theoretical contents of each section of the subject.

In order to pass the subject, both the Telecommunications exam (ExTel) and the NBC Defense exam (ExNBC) must have marks greater than or equal to 5.

### Global evaluation test

A Global evaluation test will be carried out at first or second official convocation.

This global evaluation test will consist of two parts:

**1. Telecommunications exam (ExTel).** Weight 55%. Same features as that of continuous evaluation.

**2. NBC Defense exam (ExNBC).** Weight 45%. Same features as that of continuous evaluation.

Both tests will have the same features as those used in the continuous evaluation for each section of the subject.

Thus, the mark for the subject will be calculated as follows:

Global test mark =  $\text{ExTel} \cdot 0,55 + \text{ExNBC} \cdot 0,45$

In order to pass the subject the same requirements as in the case of continuous evaluation method must be met.

## 6. Sustainable Development Goals

3 - Good Health & Well-Being

16 - Peace, Justice and Strong Institutions