

## 30172 - Defence technologies

### Syllabus Information

**Academic year:** 2023/24

**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

The subject Technologies for defence aims to contribute to the training of Army Officers on Telecommunications and NBC defence systems.

Main objectives:

- General and basic notions of telecommunications.
- Structure and operation of telecommunications networks.
- Operating principles of telecommunication networks.
- Scientific-technological fundamentals on risk and NBC protection.

These goals are aligned with some of the Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (<https://www.un.org/sustainabledevelopment/es/>), in such a way that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement. The SDGs on which the subject has an impact are: 3 and 16.

### 2. Learning results

1. Understands the operation of the simplest telecommunications systems, as well as the main modes of radioelectric propagation.
2. Recognizes and identifies any civil telecommunications system.
3. Recognizes and identifies any military telecommunications system.
4. Acquires the scientific fundamentals of NBC weapons.
5. Describes the organization of the NBC defence in the small units, and the NBC equipment of the Company type Unit.
6. Predicts areas contaminated by nuclear or chemical-biological attacks, and applies the principles of prevention, protection and control of these types of attacks.
7. Has a general knowledge of the use of NBC weapons in the field of land battle.
8. Acts as Officer in charge of the NBC Control Nucleus of a Company-type Unit.
9. Applies safety standards in the use of weapon systems.

### 3. Syllabus

#### **PART OF TELECOMMUNICATION SYSTEMS**

Unit 1. Introduction to telecommunications.

Unit 2. Signals of a telecommunications system.

Unit 3. Modulation and multiplexing.

- Unit 4. Guided transmission means.
- Unit 5. Antennas and wireless transmission.
- Unit 6. Telecommunications networks.

## NBQ DEFENSE PART

- Unit 1. Nuclear and radiological risk
- Unit 2. Chemical risk.
- Unit 3. Biohazard.
- Unit 4. Detection and identification.
- Unit 5. Protection, decontamination and zoning.

## 4. Academic activities

The methodology followed for the teaching-learning process that has been designed for this subject is based on :

- **Theoretical-practical classes** that allow the transmission of knowledge to the student, encouraging their participation. They will include practical case studies and theory, with no explicit separation between the two.
- **Personalized attention** both in small groups and individualized tutoring.
- Continued **study and personal work** by the student from the beginning of the term.
- **Evaluation tests.**

## 5. Assessment system

The following tests will be performed:

1. **Telecommunications Examination (ExTel)** ( 55 %).
2. **NBC Defense Exam (ExNBQ)** ( 45 %). This test will consist of two parts: theory part (75 %) and problem part (25 %).

The final grade will be calculated as follows:

$$\text{Continuous evaluation grade} = \text{ExTel} \cdot 0.55 + \text{ExNBQ} \cdot 0.45$$

Requirements to pass the subject:

**Requirement 1.** The grade obtained in the theory and problem parts of ExNBQ must be higher than or equal to 4.5

**Requirement 2.** The grade obtained in ExTel and ExNBQ must be greater than or equal to 5.

### Overall test

An overall test will be held at the first or second call.

Parts of the global test:

1. **Telecommunications Examination (ExTel)** ( 55 %). Same characteristics as the continuous evaluation.
2. **NBC Defense Exam (ExNBQ)** ( 45 %). Same characteristics as the continuous evaluation.

The final grade will be calculated as follows:

$$\text{Global Test Grade} = \text{ExTel} \cdot 0.55 + \text{ExNBQ} \cdot 0.45$$

In order to pass the subject, the same requirements 1 and 2 described above must be met.

Assessment instruments:	Weighting	RA-1	RA-2	RA-3	RA-4	RA-5	RA-6	RA-7	RA-8	RA-9
ExTEL	55 %	X	X	X						
ExNBQ TEO	33,75 %				X	X		X		X
ExNBQ PROB	11,25 %						X		X	

