

30151 - Missiles

Syllabus Information

Academic year: 2024/25

Subject: 30151 - Missiles

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

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

ECTS: 6.0

Year: 4

Semester: First semester

Subject type: Optional

Module:

1. General information

The subject aims for future Officers specializing in Artillery to acquire essential competencies for various aspects of their professional practice. More specifically, it focuses on the specific skills needed to understand and analyze the design, conception, operation, and performance of missile weapon systems and unmanned aerial vehicles. Additionally, it aims to develop the ability to assess the performance of a specific missile system and critically analyze its suitability for executing a particular combat mission.

2. Learning results

- LR 1: Describe the various scientific disciplines involved in the design, conception, and operation of a missile, and relate them to each other to provide an overall view with special emphasis on the guidance system.
- LR 2: Use the technical information accompanying existing missile systems to extract their capabilities.

3. Syllabus

1. Introduction to Missile Systems
2. Propulsion Systems
3. Aerodynamic and Structural Design
4. Flight Mechanics
5. Guidance and Control Systems. Guidance Laws
6. Control and Piloting Modes
7. Navigation Systems
8. Physical Laws of Thermal Radiation. Radiometry
9. Infrared Sensors: Components and Operation
10. Laser: Devices and Control Techniques
11. Operation and Characteristics of Major Missile Systems
12. Introduction to Unmanned Aerial Systems

4. Academic activities

They will be based on the use of methodologies that promote active student participation:

On-site activities (60h):

- Theoretical-practical classes with active methodologies: 32 hours
- Project analysis and development (Project-Based Learning): 10 hours
- Oral presentations and participations: 10 hours
- Evaluation tests: 8 hours

Off-site activities (90h):

- Personal study: 60 hours
- Preparation of assignments and projects by the student: 30 hours

5. Assessment system

FIRST EXAM SESSION:

Continuous Assessment:

1. Exam Block 1 (22% of the final grade): assessment of knowledge from the first part of the course.
2. Exam Block 2 (22% of the final grade): assessment of knowledge from the second part of the course.
3. Exam Block 3 (16% of the final grade): assessment of knowledge from the third part of the course.
4. Project work and deliverable activity (20% of the final grade).
5. Presentations and oral participation (20% of the final grade).

Comprehensive Exam: Students who do not pass the course through continuous assessment or who wish to improve their grade may take this comprehensive exam. It will consist of a theoretical-practical exam.

SECOND EXAM SESSION:

Comprehensive Exam: Students who do not pass the course in the first session may take this comprehensive exam. It will consist of a theoretical-practical exam.

EVALUATION CRITERIA:

These are established based on the learning results of the course. For the project and presentations, an evaluation rubric will be used. To pass the course:

- Continuous assessment: a final grade of five or higher must be obtained, and no score lower than three in any of the described assessment instruments.
- Comprehensive exam: a final grade of five or higher must be obtained.

EVALUATION INSTRUMENTS AND LEARNING RESULTS:

Evaluation instrument	LR-1	LR-2
Block 1 exam	X	X
Block 2 exam	X	X
Block 3 exam	X	X
Project work and deliverable activity	X	X
Presentations and oral participation	X	X
Comprehensive exams	X	X

6. Sustainable Development Goals

9 - Industry, Innovation and Infrastructure
16 - Peace, Justice and Strong Institutions