

Máster online 100%

Master in Drone and Antidrone Engineering for Security and Emergencies + 60 ECTS Credits

Structuralia

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Master in Drone and Antidrone Engineering for Security and Emergencies + 60 ECTS Credits

Modality
Online

Languages
Español

Duration
1500 hours (60 ECTS)

No Limit
AI Assistant

Does it include practices?
NO

Educational Institutions

Structuralia Engineering eLearning

UNIVERSIDAD NEBRIJA

Summary

The Master in Drone and Antidrone Engineering for Security and Emergencies offers a high-level specialization for professionals in public and private security, defense and emergency response. This program delves into the engineering of unmanned aerial systems (UAS) and its evolution, from its origin to the application of current legislation, including European and Latin American regulatory frameworks, essential to operate rigorously in various jurisdictions. You will advance in essential technical and operational aspects, exploring the typology of professional UAS, both civil and military, and you will understand advanced flight modes to optimize each mission. You will learn to prepare detailed equipment technical sheets and evaluate the performance of unmanned aircraft, guaranteeing impeccable planning and execution. This master's degree equips you with methodologies and technical knowledge to address critical missions, from strategic surveillance to search and rescue, integrating anti-drone technology for the protection of sensitive spaces and operations. You will develop a comprehensive vision that will allow you to make informed decisions

and lead teams in complex scenarios, ensuring effectiveness and safety in each intervention, adapting to the demands of a constantly evolving sector.

Agenda

MODULE 1. ORIGIN AND INTRODUCTION TO PROFESSIONAL USE WITH UAS (DRONES)

1. DIDACTIC UNIT 1. HISTORY AND ORIGIN OF UAS

1. What is a Drone?
2. Background and origin of UAS
3. History of UAS worldwide
4. History of UAS in Spain
5. Present and future of UAS

2. DIDACTIC UNIT 2. INTRODUCTION TO SPANISH AND LATAM LEGISLATION

1. Aeronautical Authorities in Spain
2. Aeronautical Authorities in LATAM
3. Spanish UAS Legislation
4. LATAM UAS Legislation
5. Requirements for RPA pilots

3. DIDACTIC UNIT 3. INTRODUCTION TO EUROPEAN LEGISLATION

1. Aeronautical Authorities in Europe
2. European UAS Legislation
3. Categories of operations in RE 2019/947
4. Requirements for UAS pilots in Europe
5. U-Space. Community airspace for UAS

4. DIDACTIC UNIT 4. PROFESSIONAL USE OF UAS

1. Current state of the sector
2. Requirements to operate UAS
3. Operations Manual for UAS DIDACTIC UNIT
4. UAS Operator Responsibilities
5. Change control and signed statements of the Operations Manual

MODULE 2. TECHNICAL AND OPERATIONAL ASPECTS OF UAS (DRONES)

1. DIDACTIC UNIT 1. TYPE OF PROFESSIONAL, CIVIL AND MILITARY UAS

1. Introduction to UAS types
2. Aircraft characterization and operational aspects
3. Takeoff and landing criteria and systems
4. Technical limitations of UAS
5. Mass centering and calibration

2. DIDACTIC UNIT 2. AIRCRAFT FLIGHT MODES

1. UAS positioning modes
2. Safety modes of unmanned aircraft

3. Payloads for unmanned aircraft
4. NATO Classification Aspects related to energy supply systems

3. DIDACTIC UNIT 3. PREPARATION OF EQUIPMENT TECHNICAL SHEETS

1. Regulations and guiding material on equipment characterization
2. Preparation of technical sheets
3. Similarity criteria between aircraft
4. Transformation of the manufacturer's manual into a UAS operational manual
5. Equipment Requirements and Acceptable Means of Compliance

4. DIDACTIC UNIT 4. PERFORMANCE OF UNMANNED AIRCRAFT

1. Forces acting on aircraft
2. Stability and flight phases
3. Global positioning systems
4. Air navigation
5. Air navigation services

MODULE 3. AERONAUTICAL COMMUNICATION AND METEOROLOGY (DRONES)

1. DIDACTIC UNIT 1. COMMUNICATIONS IN AVIATION

1. Evolution of communications in aviation
2. radio waves
3. Electromagnetic spectrum
4. Radio spectrum
5. Propagation of radio waves

2. DIDACTIC UNIT 2. CIVIL AVIATION COMMUNICATIONS

1. Frequencies of use in manned civil aviation
2. Frequencies of use in UAS operations
3. Requirements for aeronautical communications
4. Requirements for communications with air traffic managers in UAS operations
5. Danger, urgency and emergency procedures

3. DIDACTIC UNIT 3. AERONAUTICAL COMMUNICATION TECHNOLOGIES

1. Competent authorities
2. Radio navigation aids
3. air traffic control
4. Transponders
5. Aeronautical surveillance systems

4. DIDACTIC UNIT 4. IMPACT ON AIRCRAFT IN TACTICAL OPERATIONS

1. The atmosphere. Basic principles of meteorology
2. Wind. Influence on UAS operations
3. Clouds, typology and impact on flight
4. Fronts. Types of fronts and affectation
5. Visibility. Other factors influencing operations

MODULE 4. PREPARATION FOR OFFICIAL AESA EXAM AS A UAS PILOT SUBCATEGORIES A1-A3 AND A2. (DRONES)

1. DIDACTIC UNIT 1. MEDICAL, QUALIFICATION AND TRAINING REQUIREMENTS OF THE UAS UNIT

1. Qualification Requirements and Types of UAS Pilot Certificates
2. UAS Pilot Health Requirements
3. Functional organization chart of the UAS unit. Responsibilities
4. Training program within the UAS unit
5. Training records and qualification verification

2. DIDACTIC UNIT 2. IDENTIFICATION OF OCCUPATIONAL RISKS IN THE CREW

1. Crew health precautions
2. Risk identification in UAS operations
3. Operational Safety Study
4. Risk mitigation in operations with RPAS
5. Individual and Collective Protective Equipment

3. DIDACTIC UNIT 3. FIRST AID IN UAS OPERATIONS

1. Occupational Risk Prevention Legislation and RPAS risks
2. First Aid
3. Responses to Accidents with RPAS (I)
4. Responses to Accidents with RPAS (II)
5. Communication of incidents and accidents. Responsible Entities

4. DIDACTIC UNIT 4. EMERGENCY RESPONSE PLAN

1. Objective of the Response Plan. Emergency Operational Procedures (I)
2. Emergency Operational Procedures (II)
3. Plan to limit the sudden escalation effect
4. Staff Roles and Responsibilities
5. Responsibilities sheets and staff training

MODULE 5. TYPE OF MISSIONS WITH UAS (DRONES)

1. DIDACTIC UNIT 1. TYPES OF POLICE FLIGHTS AND PHASES OF FLIGHT

1. Introduction to Security Search and Rescue
2. Police use of UAS and flight modalities (I)
3. Police use of UAS and flight modalities (II)
4. Search, rescue and recovery techniques for people with UAS (I)
5. Search, rescue and recovery techniques for people with UAS (II)

2. DIDACTIC UNIT 2. TECHNOLOGY, EQUIPMENT MAINTENANCE AND WEATHER IN SECURITY OPERATIONS WITH UAS

1. Use of UAS thermal imaging cameras
2. I use photogrammetry for urban interventions
3. Transmission of images to ground equipment
4. Technical/legal maintenance of UAS and equipment

5. Impact of meteorology in search of people with UAS

3. DIDACTIC UNIT 3. IMPLEMENTATION OF UAS POLICE TACTICAL UNIT

1. Phases to implement a Police UAS or BRR Unit
2. Own risks and elements of individual and collective protection
3. Carrying out scheduled missions
4. Anthropic factors. The human being (I)
5. Anthropic factors. The human being (II)

4. DIDACTIC UNIT 4. MAPPING, POSITIONING, OROGRAPHY AND INTRODUCTION TO MILITARY UAS

1. Mapping for search and rescue teams with UAS
2. Positioning of UAS equipment for BRR
3. Orography of the search space
4. Introduction to UAS for military use
5. Small and medium-range military reconnaissance UAS that influence operations

MODULE 6. AIRSPACE (DRONES)

1. DIDACTIC UNIT 1. INTRODUCTION TO AIRSPACE. TYPOLOGY

1. History of airspace
2. Competent authorities
3. Types of airspace
4. Air navigation services (I)
5. Air navigation services (II)

2. DIDACTIC UNIT 2. DIVISION OF CONTROLLED AIRSPACE

1. airspace
2. FIZ. Flight information area
3. CTA. Control area - TMA. Terminal control area - AWY. Airways
4. CTR. air traffic control zone
5. ATZ. airfield transit zone

3. DIDACTIC UNIT 3. OTHER DIVISIONS OF CONTROLLED AIRSPACE

1. Restricted areas (R)
2. Prohibited areas (P)
3. Dangerous areas (D)
4. Temporarily reserved areas and areas restricted to photographic flight
5. Other restrictions on flying with UAS

4. DIDACTIC UNIT 4. APPLICATIONS FOR AERONAUTICAL INFORMATION (AIP)

1. Tools for consulting airspace typology
2. EARO and EAS space
3. Request for activity in controlled airspace. Use of ENAIRE Plana
4. Flight plans for UAS in ICARO XXI
5. Communication prior to flights over agglomerations of buildings

MODULE 7. ANTI-DRONE SYSTEMS, DNA METHOD. DETECTION, NEUTRALIZATION AND FORENSIC ANALYSIS. AERONAUTICAL SAFETY (DRONES)

1. DIDACTIC UNIT 1. REGULATIONS AND USE OF RADIOELECTRIC DETECTION AND INTERFERENCE EQUIPMENT

1. Legislation and use of the electromagnetic spectrum
2. UAS passive and active detection system
3. UAS neutralization system (I)
4. UAS neutralization system (II)
5. Comprehensive anti-drone security plan (PSIAD)

2. DIDACTIC UNIT 2. PREPARATION OF STRATEGIC PROCEDURES FOR OPERATIONS OPERATIONAL SCENARIOS

1. Flight preparation
2. Standard operating procedures. Normal procedures
3. Contingency procedures
4. Emergency procedures
5. ERP Emergency Response Plan

3. DIDACTIC UNIT 3. OPERATIONAL MANAGEMENT

1. Operational safety
2. Operational risk management
3. Operational control in tactical flight with UAS
4. Procedure to validate a tactical flight
5. Ground operational control

4. DIDACTIC UNIT 4. JUST CULTURE POLICY AS AN OPERATIONAL SECURITY STRATEGY

1. Just Culture Policy. Introduction
2. Regulatory framework and human error
3. Guilt Decision Tree
4. Developing and maintaining the right culture
5. Evaluate the degree of maturity of the implementation

MODULE 8. LIGHT UNMANNED AIRCRAFT OPERATOR CERTIFICATE - LUC (DRONES)

1. DIDACTIC UNIT 1. INTRODUCTION TO LUC

1. What is a LUC certificate?
2. Objectives and scope of a LUC Manual (LUC-M)
3. Operational Safety System (SMM) (I)
4. Operational Safety System (SMM) (II)
5. Minimum content of the introductory part of the LUC-M

2. DIDACTIC UNIT 2. CONOPS, UAS UNIT STAFF AND NORMAL, CONTINGENCY AND EMERGENCY PROCEDURES

1. CONOPS and technical means

2. Operations, training and health personnel
3. Normal Procedures
4. Contingency and Emergency Procedure
5. Emergency response plan

3. DIDACTIC UNIT 3. ENVIRONMENTAL IMPACT OF THE UAS, COLLECTION OF PERSONAL DATA AND AUDIT OF THE LUCO

1. UAS environmental impact and event notification
2. Data registration, communication and responsible declaration
3. Data collection with UAS and fundamental rights
4. LUCO audit and data management
5. LUC-MF content

4. DIDACTIC UNIT 4. ANNEXED DOCUMENTS THAT MUST BE INCLUDED IN THE LUCM AND LUC-MF

1. LUC-M Annexes. Responsible declaration and UAS technical sheet
2. LUC-M Annexes. Maintenance and flight check sheets
3. LUC-M Annexes. Emergency response flowcharts
4. Annexes LUC-M and LUC-MF. Reviews, records and training content STS-ES-01
5. Annexes LUC-M and LUC-MF. Training content STS-ES-02.

MODULE 9. UAS MAINTENANCE PROGRAM AND PILOT TOOLS (DRONES)

1. DIDACTIC UNIT 1. REGULATORY CONCEPT

1. Basic Concepts, Historical Context and Regulatory Framework
2. Important Definitions
3. Main Applicable Procedures. Open Category
4. Main Applicable Procedures. Subcategories A1, A2 and A3
5. Main Applicable Procedures. Specific and Certified Category, Registration and Operator Responsibilities

2. DIDACTIC UNIT 2. GENERAL KNOWLEDGE OF FLIGHTS WITH UAS

1. Basic principles of flight
2. Effects of environmental conditions on UAS flight and UAS components
3. Command and control principles
4. Communications, Sensors, Flight Instruments and Essential UAS and Maintenance Information
5. Introduction, Definitions, Structure, Airspace Restrictions and UAS Flight Zones

3. DIDACTIC UNIT 3. OPERATIONAL PROCEDURES

1. Limitations of human factors. Insurance and accidents and incidents with UAS
2. UAS privacy, data protection and physical security
3. Pre-Flight Operational Procedures
4. Operational Procedures During the flight
5. Post-flight Operational Procedures. Checklist

4. DIDACTIC UNIT 4. EXAM PREPARATION AND REGISTRATION AS A UAS OPERATOR

1. Procedures and needs to be a UAS Operator
2. Preparatory Summary and webinar for the AESA Official Exam. Regulatory Concept
3. Preparatory Summary and webinar for the AESA Official Exam for the Exam. General Knowledge
4. Preparatory Summary and webinar for the AESA Official Exam for the Exam. Operational Procedures
5. Simulation of official exams

MODULE 10. TFM. MASTER IN DRONE AND ANTIDRONE ENGINEERING (DRONES)

Qualification

University Degree in Master of Lifelong Training in Drone and Anti-Drone Engineering for Security and Emergencies issued by the Antonio de Nebrija University with 60 ECTS University Credits. Teachings not leading to obtaining an official qualification

Objectives

- • You will lead the planning and execution of UAS operations in security and emergency environments, applying a strategic vision. • You will design strategies for the professional use of drones, considering the type of aircraft and their flight modes for specific missions. • You will manage the integration of anti-drone systems in protection and response operations, optimizing the security of infrastructure and personnel. • You will evaluate the impact of European and Latin American legislation on UAS operation, ensuring regulatory compliance in each intervention. • You will make informed decisions about the selection and performance of UAS equipment, based on technical data sheets and operational requirements. • You will implement advanced methodologies for search and rescue missions with drones, maximizing effectiveness in complex scenarios. • You will integrate a global vision of the origin and evolution of UAS, anticipating trends and adapting operations to future challenges. • You will lead multidisciplinary teams in the application of security and emergency protocols with drones, promoting coordination and operational efficiency.

What does it prepare you for?

This program prepares you to lead the strategic management of unmanned aerial systems and anti-drone countermeasures in highly complex scenarios. You will acquire the skills to design and implement advanced methodologies in search and rescue missions, optimizing the response to critical situations and locating people. You will master the technical and operational aspects of various types of unmanned aircraft, including professional, civil and military models, and you will learn to prepare equipment technical sheets and evaluate their performance. In addition, you will understand in depth the applicable legislation, at the national, European and Latin American level, to operate with total security and regulatory compliance. You will develop a comprehensive vision of the implementation and operation of anti-drone countermeasure systems, allowing you to make informed decisions for the protection of infrastructure and risk management in security environments.

Who is it addressed to?

Aimed at active professionals in the public and private protection, defense, search and rescue sectors, who already operate or manage unmanned aircraft systems and are seeking high-level specialization. If you are a member of security forces, military, firefighter, forestry or rural agent, or work in civil protection, this program offers you the tools to optimize your operations. It is also designed for security directors, security guards and rural guards who wish to integrate and lead the implementation of drone and anti-drone technologies in their protection and emergency response strategies, mastering advanced techniques and methodologies for critical missions with drones, guaranteeing effectiveness, speed, security and compliance with applicable regulations.

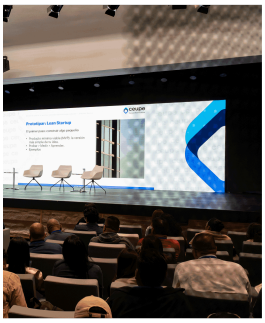
Official Character

This training is not included within the scope of official regulated training (Early Childhood Education, Primary Education, Secondary Education, Official Vocational Training FP, Baccalaureate, University Degree, Master University Officer and Doctorate). It is therefore a complementary and/or specialization training, aimed at the acquisition of certain competencies, skills or aptitudes of a professional nature, which can be assessed as merit in job boards and/or competitive examinations, always within the section of Complementary Training and/or Continuous Training. It is always essential to review the specific grading requirements of the specific public job boards to which we wish to apply.

Professional Outings

- Specialization in the application of unmanned aerial systems and countermeasures positions you to assume highly responsible roles in the security and emergency sector. You will be able to lead teams as Director of UAS Operations, managing fleets and critical missions in complex protection and response environments. You will be able to serve as a Strategic Drone Protection Consultant, designing and implementing advanced defense protocols and countermeasures for sensitive infrastructure or large-scale events. You will also be able to lead the Coordination of Search and Rescue Missions with Drones, optimizing the response in crisis situations and natural disasters. Additionally, your ability to implement and manage C-UAS systems will allow you to assume the role of Anti-Drone Solutions Architect, integrating detection and neutralization technologies. This training prepares you to be a reference in the application of these technologies in the field of public and private security, as well as in defense operations, contributing to operational effectiveness and security.







Live Madrid

Live the International Week

As an additional complement to your training, you can be part of the SIM: Week International in Madrid. A unique meeting that brings together students from all over the world. For seven days you can live an academic and cultural experience in the heart of Europe, culminating with the graduation ceremony in Madrid.

- Conferences and workshops with international experts
- Visits to companies and reference organizations
- Networking with students from different countries
- Cultural activities and discovery of Madrid
- graduation ceremony

Structural

Structuralia is a leading educational institution in postgraduate and highly specialized online training, focused on the fields of engineering, architecture, construction, energy, technology and digital transformation.

Founded in 2001 with a strong industrial DNA, the result of collaboration between large companies in the sector and the Universitat Politècnica de Catalunya (UPC), for more than 25 years we have accompanied technical professionals in their academic and professional development through practical, flexible training aligned with the reality of the labor market.

Our training proposal connects advanced technical knowledge, real employability and international projection, acting as key support in the professional evolution of those seeking to specialize, grow professionally and generate impact in their sector, with a firm commitment to the democratization of access to technical excellence.



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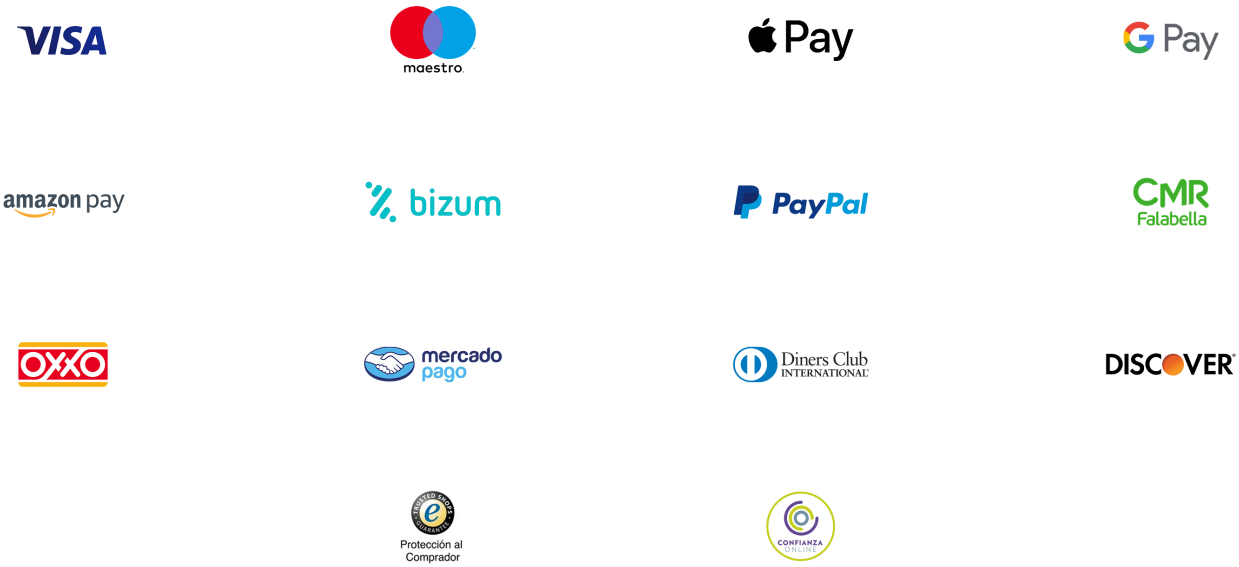
EDUCA EDTECH Group leads the digital revolution in education, promoting the continuous learning and technological transformation. The group is made up of recognized training institutions and its mission is to democratize access to education, promote the transfer of knowledge, technological development and research.

With the experience accumulated over more than 20 years, we have perfected our learning platform EDUCA LXP (Learning Experience Platform), the basis of our educational methodology, which provides students with online training practical and meaningful.



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Funding and scholarships

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15%
Scholarship recommended

20%
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