DIPLOMA OF EXPERT IN GEOINFORMATION TOOLS FOR CLIMATE CHANGE MANAGEMENT (GEOCLIC)

e-Handbook

Erasmus+ GeoCLIC Project

Geoinformation Educational Resources for Climate Change Management

GeoCLIC

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Diploma of expert in Geoinformation tools for climate change management

Contents

1. Introduction

Climate change (CC) poses significant challenges globally, leading to extreme weather events, rising sea levels, and health impacts due to greenhouse gas emissions. The complexity of CC requires advanced geoinformation technologies, such as geographic information systems (GIS) and remote sensing techniques, and interdisciplinary collaboration, with a growing need for quality online training. Within the framework of the Erasmus+ GeoCLIC project, *Geoinformation Educational Resources for Climate Change Management*, and with the participation of specialists from five European universities, a series of online educational materials have been developed collaboratively on the use of GIS technologies and remote sensing for the management of the evolution of agricultural, forest, urban and coastal ecosystems, and the monitoring of the effects of climate change.

More and more companies and public administrations need specialists and technicians capable of interpreting, processing and analysing different types of geographical and Earth observation data (satellite and aerial images, LiDAR data, etc.) to carry out continuous monitoring of terrestrial, urban and coastal ecosystems, adapt techniques for the use of natural resources to optimise them and reduce the impact on the environment, diagnose its degradation and propose actions and policies that reduce the impact of climate change and improve our adaptation. In addition to the management of the great diversity of data available today - an example is Earth observation data and derived products available through the European Copernicus programme - the application of geographic information technologies requires a multidisciplinary vision, including and training specialists in environmental sciences and ecology, agronomic engineering, forestry, geomatics and civil, as well as territorial and urban planning.

In this context, the online learning materials created in the framework of the GeoCLIC project by experts from Vrije Universiteit Brussel (VUB), University of Applied Sciences Weihenstephan-Triesdorf (HSWT), University of Zagreb (UNIZG), University of Nicosia (UNIC) and Universitat Politècnica de València (UPV), respond to this multidisciplinary approach. The Diploma of Expert in Geoinformation Tools for Climate Change Management consists of five modules: a transversal module for the acquisition of concepts and basic skills in data management georeferenced and images; and four applied modules in which these data and techniques are used to understand and manage the effects of climate change in urban areas, in forest conservation, in the analysis and management of coastal zones, and in the optimization of agronomic techniques. This online educational programme is also supported and endorsed by the European company GDi, a provider of technological solutions in the field of geoinformation, and Human Resource Development Authority of Cyprus (HRDA), both partners of the project GeoCLIC.

2. General objectives

The general objectives of the diploma of expert in geoinformation tools for climate change management are:

- To provide students with the basic principles of geographic information systems, the interpretation of Earth observation data and their processing for their application in the monitoring of terrestrial ecosystems.
- Identify the main effects of climate change on agroforestry, coastal and urban systems that can be reduced through the use of geo-information techniques.
- Train in the use of tools for the processing and analysis of Earth observation data and other georeferenced data aimed at adapting to climate change and reducing its effects on agroforestry, coastal and urban systems.
- Analyse and evaluate results obtained using remote sensing and GIS techniques to optimise the management of different types of terrestrial ecosystems.

3. Overview and training itinerary

The " Diploma of Expert in Geoinformation Tools for Climate Change Management" is a specialized online program designed to address the pressing global challenges of climate change through advanced geoinformation technologies such as GIS and remote sensing. The diploma provides students with the knowledge and skills to analyse and interpret geospatial data to monitor ecosystems, and to the use of tools to develop strategies for climate adaptation and mitigation.

This 15 ECTS independent diploma is entirely online and taught in English, to be accessible to a global audience. It is structured into two main subjects, combining theoretical principles and practical applications. The first subject, "Basis of Remote Sensing and GIS" (3 ECTS), introduces core concepts, methodologies, and tools required for geoinformation analysis, serving as a prerequisite for other courses. The second subject, "Applications of Geoinformation Tools for Climate Change Management" (12 ECTS), includes four specialized courses: *Coastal Dynamics Management*, focusing on coastal monitoring and risk assessment; *Smart Agriculture*, addressing agro-environmental monitoring and sustainable resource management; *Urban Monitoring*, emphasizing urban climate analysis and mitigation; and *Forest Conservation*, exploring the impacts of climate change on forests and the use of remote sensing for their management.

Subject	Code	Name	ECTS
Basis of Remote Sensing and GIS (3 ECTS)	01	Basis of Remote Sensing and GIS	3
Application of Geoinformation Tools for Climate Change Management (12 ECTS)	02	Coastal Dynamics Management	3
	03	Smart Agriculture	3
	04	Urban Monitoring	3
	05	Forest Conservation	3

The program adopts a multidisciplinary approach, integrating knowledge from ICT, geography, environmental science, cartography, agroforestry and urban planning. Students will gain hands-on experience using industry-standard tools like QGIS and UMEP, applied to real-world scenarios such as monitoring coastal erosion, mapping urban heat islands, optimizing agricultural practices, and assessing forest resilience. The course also emphasizes the application of European climate resilience strategies, preparing students to address environmental challenges in various professional contexts.

Admission requirements include a bachelor's degree or equivalent, with provisional acceptance for final-year students who have up to 30 ECTS pending. Proficiency in English is mandatory, assessed during the admission process. The evaluation combines practical exercises, theoretical multiple-choice tests, and optional synthesis or literature analysis for specific modules. Upon completing all 15 ECTS, students earn the full diploma, while individual certifications are granted for each completed module.

The structure of the diploma is made up of subjects and courses, understanding *subject* as the academic unit that includes one or more courses that can be conceived in an integrated manner, and *course* as the basic unit in which teaching is organized. The student will enrol in the courses.

The program offers flexibility in learning, with all materials delivered via a Moodle learning online platform adapted by the University of Nicosia, and features a blend of theoretical lectures, interactive exercises, and case studies. With a faculty composed of professors and specialists from five different European universities, international experts in GIS, remote sensing and climate adaptation, this diploma provides a dynamic and practical learning experience, empowering professionals and students to specialize in climate change management through cutting-edge geoinformation technologies.

GeoCLIC

4. Description of the courses

4.1. *Basis of Remote Sensing and GIS*

Subject	Basis of Remote Sensing and GIS
Title	Basis of Remote Sensing and GIS
Degree	Diploma of Expert in Geoinformation Tools for Climate Change Management
Coordinator	Prof. Olaf Gerhard Schroth (HSWT) and Prof. Andrija Krtalić (UNIZG)
Teachers	- Prof. Olaf Gerhard Schroth (HSWT) - Prof. Andrija Krtalić (UNIZG)
Level	Posgraduate
Mode of delivery	e-learning
Language	English
Workload	3 ECTS

4.1.1. Course Description

This transversal course consists of theoretical sessions in which the bases and fundamentals of remote sensing techniques, digital photogrammetry and geographic information systems are described, along with practical exercises in which data are interpreted and methodologies for spatial analysis and satellite and aerial image processing and analysis are applied. Students will gain basic knowledge about the types of sensors and images and image acquisition in photogrammetry and remote sensing. It is necessary to pass this course before taking the rest of the four courses applied.

4.1.2. Learning Objectives

- Know the basic concepts of remote sensing, photogrammetry and GIS.
- Enter the main sensors, types and properties of the images.
- Interpret and analyse multispectral, hyperspectral, and thermal images.
- Introduce GIS tools for spatial analysis.

4.1.3. Learning Outcomes

Competence 1: Identify aerial and satellite imagery acquisition systems and interpret and analyse them as a basis for use in different environmental, natural resource and urban applications.

- Define the terms Remote Sensing and Photogrammetry and explain the differences between them.
- Describe the basic characteristics of Remote Sensing images (types of resolution and data, etc.)
- Interpret different types of images acquired by remote sensing.

Competence 2: Know the basis of GIS and its application in basic problems of spatial analysis.

- Define the concept of Geographic Information Systems.
- Learn how to use GIS tools and apply them to basic spatial analysis problems.

4.1.4. Contents

1. Introduction to Geoinformation Tools.
    - Environmental Monitoring with Satellite Images a Remote Sensing Perspective.
    - Electromagnetic Wave and Optical Remote Sensing.
    - Preprocessing of remote sensing images.
    - Classification of Remote Sensing Imagery.
2. Basics of Geographic Information Systems (GIS).
    - Geographic Information Systems GIS - Introduction.
    - Data Formats and Quality.
    - Digital Terrain Models DTM
    - Data Inputs.
    - Geoprocessing.
    - Cartography.
    - Remote Sensing and GIS tutorials.
    - Land Cover Classification with a Satellite Image.
    - Pre-processing.
    - Image Classification and Accuracy Assessment.
    - Mapping in QGIS.
    - Complete Beginner's Guide to ArcGIS Desktop.
    - EU Copernicus Land Monitoring Service for open environmental geodata.
    - How to download and work with OpenStreetMap data.
    - GIS reading list.
3. GIS & RS in Agriculture.

  - Use of GIS in Agriculture.
  - An Exercise on Climate Friendly Land Use.
  - Proximal & Soil Spectroscopy in Agriculture
4. Introduction to Photogrammetry and Remote Sensing.
  - Introduction to Photogrammetry and Remote Sensing
  - Electromagnetic Spectrum
  - Electromagnetic Spectrum and Atmosphere
5. Sensors.
  - Sensors
  - Digital Images
  - Sensor Perception of the Environment.
6. Image Interpretation.
  - Image interpretation
  - Spectral Indices
  - Spectral Signature
7. Resolution and Application of Remote Sensing.
  - Resolution Types in Remote Sensing.
  - Application of Remote Sensing Methods.
8. Final Exam & Project Submission.

4.1.5. Teaching and Learning Methods

- Short video lectures with PowerPoint presentations and reading materials that provide foundational knowledge on coastal dynamics, geomatics, and remote sensing.
- Practical sessions are focused on developing technical skills, including the use of tools such as QGIS, Cloud Compare, and SAET for data processing and analysis.
- Quizzes are used to consolidate knowledge and assess comprehension of key topics.

4.1.6. Pre-Requisites

A bachelor's or engineering degree is required. Exceptionally, bachelor's degree students who have a maximum of 30 ECTS pending access may enter.

Given that the training will be entirely in English, a minimum level of comprehension in this language is required, which will be assessed by the degree committee.

4.1.7. Evaluation

The evaluation will be carried out by checking the results obtained in the practical exercises and passing a multiple-answer test on the theoretical concepts developed.

4.2. *Coastal Dynamics Management*

Subject	Applications of Geoinformation Tools for Climate Change Management
Title	Coastal Dynamics Management
Degree	Diploma of Expert in Geoinformation Tools for Climate Change Management
Coordinator	Prof. Josep E. Pardo-Pascual (UPV)
Teachers	- Prof. Josep E. Pardo-Pascual (UPV) - Dr. Jaime Almonacid-Caballer (UPV) - Prof. Alfonso Fernández Sarriá (UPV) - Prof. Jesús Manuel Palomar Vázquez (UPV) - Prof. Luis Ángel Ruiz Fernández (UPV) - Dr. Pablo Crespo-Peremarch (UPV)
Level	Posgraduate
Mode of delivery	e-learning
Language	English
Workload	3 ECTS

4.2.1. Course Description

Knowledge of the key factors that determine sea level and its changes, mainly everything when they involve a risk, and how climate change will exacerbate these risks. Techniques for the characterization of three-dimensional changes in coastal segments using LiDAR data and Geographic Information Systems are described and applied through practical exercises; as well as the use of radar satellite images to detect bodies of water and map flooded areas. Multispectral satellite images are also used to monitor the evolution of the beaches, applying free software that allows automatic extraction of coastlines and describing techniques to analyse them.

4.2.2. Learning Objectives

- To know how and why coastal spaces evolve and how they are expected to respond to climate change.
- Apply different remote sensing techniques for the detection, mapping and quantification of coastal changes and events, both surface and three-dimensional, using different types of data (LiDAR, optical satellite imagery and radar) and explain the cause of these changes.

4.2.3. Learning Outcomes

- Design a model of changes by comparing LiDAR surveys of the same coastal sector and quantify the changes.
- Use radar imagery to map bodies of water and detect flooded areas.
- Use multispectral satellite imagery to automatically detect coastlines.
- Quantify changes in coastal surfaces and volumes and explain the processes that have caused them.

4.2.4. Contents

1. Introduction.
    - Introduction to coastal dynamism studies using remote sensing.
2. Sea level variation and coastal dynamics.
    - Sea level variations.
    - Main agents control coastal geomorphic dynamics.
    - Nearshore sediment transport.
3. Coastal evolution.
4. Methods for characterization of beaches and dunes.
    - Introduction.
    - Point cloud visualization with CloudCompare. .
    - Distances between point clouds in CloudCompare.
    - Ground points filtering with FUSION/LDV integrated in QGIS.
    - DTM from ground points. Difference between DTMS.
5. Water bodies extraction from satellite images.
    - Water areas from satellite.
    - Extraction of water bodies from Sentinel-1.
    - Extraction of water bodies from Sentinel-2.
6. Rapid flood mapping with SAR images
    - Introduction to SAR images.
    - Rapid flood mapping using SAR images.
    - Rapid flood mapping with Google Earth Engine.

7. Automatic extraction of coastlines from optical satellite imagery
    - Pixel-scale approach.
    - Sub-pixel scale approach.
    - SAET (Shoreline Analysis and Extraction Tool).
    - Download and installation of SAET.
    - Estimation of storm coastal impact with SAET
8. Analysis of changes bases on SDSs
    - Transect-based methods.
    - Spatio-temporal methods.
9. Final Exam.

4.2.5. Teaching and Learning Methods

- Short video lectures with PowerPoint presentations and reading materials that provide foundational knowledge on coastal dynamics, geomatics, and remote sensing.
- Practical sessions are focused on developing technical skills, including the use of tools such as QGIS, Cloud Compare, and SAET for data processing and analysis.
- Quizzes are used to consolidate knowledge and assess comprehension of key topics.

4.2.6. Pre-Requisites

A bachelor's or engineering degree is required. Exceptionally, bachelor's degree students who have a maximum of 30 ECTS pending access may enter.

Given that the training will be entirely in English, a minimum level of comprehension in this language is required, which will be assessed by the degree committee.

4.2.7. Evaluation

The evaluation will be carried out by checking the results obtained in the practical exercises and passing a multiple-answer test on the theoretical concepts developed. In some cases, synthesis and bibliography analysis work carried out by the student will also be evaluated.

4.3. Smart Agriculture

Subject	Applications of Geoinformation Tools for Climate Change Management
Title	Smart Agriculture
Degree	Diploma of Expert in Geoinformation Tools for Climate Change Management
Coordinator	Prof. Ivana Šestak (UNIZG)
Teachers	- Prof. Ivana Šestak (UNIZG) - Prof. Monika Zovko (UNIZG) - Prof. Marina Bubalo Kovačić (UNIZG) - Prof. Željka Zgorelec (UNIZG) - Prof. Darija Bilandžija (UNIZG) - Prof. Olaf Gerhard Schroth (UNIZG) - Prof. Bernhard Schauberger (UNIZG)
Level	Posgraduate
Mode of delivery	e-learning
Language	English
Workload	3 ECTS

4.3.1. Course Description

Theoretical background and state-of-the-art methodologies that apply GIS and SR tools in agri-environmental monitoring and climate change management in agriculture are provided, with practical tasks for students, such as maps of vegetation indices, soil erosion risk, indices for precision irrigation, and soil property prediction models.

4.3.2. Learning Objectives

- Choose and apply appropriate agri-environmental monitoring and spatial data analysis tools in agricultural applications.

- Ability to process and analyse agri-environmental data and recommend possible improvements in agricultural production through the use of digital applications and tools.

4.3.3. Learning Outcomes

- Apply GIS and SR tools and technologies in agricultural production and agri-environmental monitoring.
- Analyse and evaluate results from the field, laboratory, GIS and remote sensing to optimise agricultural management in relation to climate change (crop adaptation, smart irrigation, soil quality study).
- Develop a plan for sustainable and climate-resilient crop production using smart farming tools.

4.3.4. Contents

1. Identifying and Assessing Climate Change Impacts on Agroecological Systems.
    - Climate change influence on Agricultural Systems & Food Production.
    - Challenges Faced in Agriculture due to Climate Change & Food Production.
2. Data Collection and Monitoring Tools – RS/GIS Theory.
    - Data sources in precision agriculture.
    - Remote and proximal sensing in agriculture.
    - Remote and proximal sensing in agriculture.
    - Case study.
3. RS/GIS Data Analysis
    - An exploratory approach to the utilization of GIS and RS in agriculture.
    - Modelling erosion.
    - Quick LS-factor calculation using Q-GIS.
    - Water management in agriculture.
4. Data Analysis - Proximal Spectroscopy.
    - Chemometry in spectral data analysis.
    - Soil spectroscopy.
    - Building prediction models for soil pH, TN, K_2O and P_2O_5 content.
5. Identifying and Prioritizing Climate Adaptation for Agriculture.
    - Crop Adaption.
    - Crop yield monitoring & forecasting.
    - Climate change impacts on crop production.
    - Identifying and assessing climate change impacts on agroecological systems.
6. Final Exam.

4.3.5. Teaching and Learning Methods

- Short video lectures with PowerPoint presentations and reading materials that provide foundational knowledge on coastal dynamics, geomatics, and remote sensing.
- Practical sessions are focused on developing technical skills, including the use of tools such as QGIS, Cloud Compare, and SAET for data processing and analysis.
- Quizzes are used to consolidate knowledge and assess comprehension of key topics.

4.3.6. Pre-Requisites

A bachelor's or engineering degree is required. Exceptionally, bachelor's degree students who have a maximum of 30 ECTS pending access may enter.

Given that the training will be entirely in English, a minimum level of comprehension in this language is required, which will be assessed by the degree committee.

4.3.7. Evaluation

The evaluation will be carried out by checking the results obtained in the practical exercises and passing a multiple-answer test on the theoretical concepts developed. In some cases, synthesis and bibliography analysis work carried out by the student will also be evaluated.

4.4. *Urban Monitoring*

Subject	Applications of Geoinformation Tools for Climate Change Management
Title	Urban Monitoring
Degree	Diploma of Expert in Geoinformation Tools for Climate Change Management
Coordinator	Prof. Jonathan Chan (VUB)
Teachers	- Prof. Jonathan Chan (VUB)
Level	Posgraduate
Mode of delivery	e-learning
Language	English
Workload	3 ECTS

4.4.1. Course Description

This course describes the principles of monitoring the effects of urban heat islands using satellite data to estimate the temperature of the earth's surface, as well as sensor technologies, such as hyperspectrals, to map urban covers, and photogrammetry based on LiDAR and drones for morphological characterization. Students will learn how to use geo-information tools, such as QGIS and the UMEP add-on, to obtain results such as land cover classification according to Local Climate Zones and urban climate modeling. A brief introduction to the use of urban metrics in urban planning and slum mapping will be provided. The theory and practical exercises will be applied in a real case on urban heat islands.

4.4.2. Learning Objectives

- Monitor and describe the relationship and connections between climate change and urban areas with geo-information tools.
- Application of remote sensing and GIS data for the simulation and monitoring of urban climate.

4.4.3. Learning Outcomes

- Explain the relationship between urbanization, heat island effect and Climate Change.
- Estimate the temperature of the land surface from satellite data, applying the land cover classification of the local climate zone for urban climate monitoring.
- Apply planning and mapping of climate-sensitive urban inequalities for social applications.

4.4.4. Contents

1. RS/GIS for Climate research in City/Urban broad view.
    - Introduction to Urban Climate and mitigation.
    - Urban Heat Island. Not just big cities, but also medium and even small-sized cities.
    - Urban expansion as one of the major drivers of surface temperature increases.
    - How remote sensing and geoinformation are used in Urban Climate.
2. Urban Heat Island and Local Climate Zone.
    - Derivation of Land surface temperature from Landsat satellite images (Practical 1).
    - Urban mapping using Local Climate Zone principles (Practical 2).
3. Urban Climate Modelling.
    - Urban Multi-scale Environmental Predictor.
    - City-base Climate Service.
4. Novel sensor technologies in urban Climate research.
    - Hyperspectral for urban land use/land cover classification.
    - 3D reconstruction using drone-based photogrammetry and LiDAR.
5. Climate modelling with Morphological study.
    - Climate Sensitive Planning and Urban Morphology Practical case of applying.
6. RS/GIS in climate adapted planning. (Practical 3).
    - Social applications: Climate Change, Spatial Deprivation and HUI.
7. Climate Change and Deprivation Mapping.
    - Socio-economic data and HUI.
    - Mapping of slum.
8. Project report: Using a fast growing city as an example to understand urban climate change and mitigation using geoinformatics.

4.4.5. Teaching and Learning Methods

- Short videos of Lectures with PPT and reading materials.

- Progressive accumulative learning.
- Quizzes and exam to consolidate knowledge.
- Practicals to learn processing skills (QGIS, LCZ generator, UMEP).
- Final report to apply learned skills in real case studies.

4.4.6. Pre-Requisites

A bachelor's or engineering degree is required. Exceptionally, bachelor's degree students who have a maximum of 30 ECTS pending access may enter.

Given that the training will be entirely in English, a minimum level of comprehension in this language is required, which will be assessed by the degree committee.

4.4.7. Evaluation

The evaluation will be carried out by checking the results obtained in the practical exercises and passing a multiple-answer test on the theoretical concepts developed. In some cases, synthesis and bibliography analysis work carried out by the student will also be evaluated.

4.5. *Forest Conservation*

Subject	Applications of Geoinformation Tools for Climate Change Management
Title	Forest Conservation
Degree	Diploma of Expert in Geoinformation Tools for Climate Change Management
Coordinator	M.Sc. Kyriakos Georgiou (UNIC)
Teachers	- M. Sc. Kyriakos Georgiou (UNIC) - Prof. Luis Ángel Ruiz Fernández (UPV) - Dr. Pablo Crespo-Peremarch (UPV) - M.Sc. Juan Pedro Carbonell-Rivera - M.Sc. Jesús Torralba Pérez
Level	Posgraduate
Mode of delivery	e-learning
Language	English
Workload	3 ECTS

4.5.1. Course Description

This course will identify the general European strategies for the management and conservation of forests and their diversity, as well as the basic actions for their adaptation and resilience in relation to climate change. The main risks and threats of natural disasters that forests have, in particular forest fires, will also be known, aerial LiDAR systems, ground laser scanners and point clouds derived from images acquired from drones will be described and will be applied to the classification of forest typologies, classification of species and generation of models for the estimation of biomass and other combustibility variables, combining theoretical sessions with practical exercises using free software.

4.5.2. Learning Objectives

- To know the impact of climate change on forests, European strategies and the use of remote sensing tools for the characterisation of the structure and combustibility of forest ecosystems.
- Identify the impact of climate change on forests and the risk of forest fires, and learn about the main European strategies for the management and maintenance of their quality and biodiversity and offset CO_2 emissions.
- Know and apply remote sensing techniques, photogrammetry with drones and LiDAR data processing and laser scanner for the classification of fuel types and the estimation of combustibility variables in forests.

4.5.3. Learning Outcomes

- Identify the European Union's strategy for forest conservation and recognise the effects of climate change on forests.
- Use remote sensing data and point clouds (LiDAR, UAV and terrestrial laser scanner) and apply them to the classification of forest fuel types and the estimation of forest combustibility variables.
- Know the basic aspects of risk and emergency management in forest ecosystems and analyse the relationship between forest fires and climate change.

4.5.4. Contents

1. Introduction to forest conservation.
2. Climate change impact on forests.
3. Classification of fuel types and species.
    - Principles and application of LiDAR data.
    - Drone mapping: Photogrammetry based on Unmanned Aerial Vehicles.
    - Generation of point clouds from UAV images with Meshroom.
    - Classification of vegetation species in point clouds using Class3Dp.
4. Mapping forest structure and fuel variables.
    - Characterization of forest structure using airborne LiDAR.
    - Estimation of fuel and inventory variables using LiDAR data.
    - Mapping forest structure variables.
    - Terrestrial Laser Scanning for the assessment of forest ecosystems.
    - Using terrestrial laser scanning (TLS) for 3D forest structure characterization.
    - Application of TLS in forest inventories.
5. Disaster/Emergency risk analysis and management.
6. Classification of fuel types and species.
7. Final Exam & Project Submission.

4.5.5. Teaching and Learning Methods

- Lectures, interactive discussions, and hands-on activities combine theoretical and practical learning approaches.
- Practical sessions focus on the use of LiDAR data, UAV photogrammetric methods, and terrestrial laser scanning (TLS) to model and visualize forest structure and fuel variables.
- Exercises include creating point clouds and classifying vegetation species with Class3Dp using real-world data.

4.5.6. Pre-Requisites

A bachelor's or engineering degree is required. Exceptionally, bachelor's degree students who have a maximum of 30 ECTS pending access may enter.

Given that the training will be entirely in English, a minimum level of comprehension in this language is required, which will be assessed by the degree committee.

4.5.7. Evaluation

The evaluation will be carried out by checking the results obtained in the practical exercises and passing a multiple-answer test on the theoretical concepts developed. In some cases, synthesis and bibliography analysis work carried out by the student will also be evaluated.