# FIRST-LEVEL POSTGRADUATE MASTER'S PROGRAMME IN GEOMATICS (GEOM)

# A.Y. 2026/2027

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|---|---|
| Total duration | 12 months |
| Teaching period | January 2027 - October 2027 |
| Internship period | October 2027 - January 2028 |
| Total teaching hours (Lectures, Practical Sessions and Laboratories) | 488 |
| Total Internship hours | 300 |
| Total credits (CFU/ECTS) | 75 |

## Awarding Institution

University of Siena - Via Banchi di Sotto 55 - 53100 Siena (Italy)

## Programme Type

First-Level Postgraduate Master's Programme

## Aims and Objectives

The Postgraduate Master's Programme aims to train professionals with advanced skills in the latest **geo-informatics technologies**, enabling them to acquire, manage, analyse, monitor, update and disseminate geospatial data **geospatial data**. The programme covers geodesy, topographic surveying, cartography, spatial databases, Geographic Information Systems (GIS), spatial analysis and geoprocessing in 2D and 3D georeferenced environments, geostatistics, remote sensing, aerial digital photogrammetry (including terrestrial and drone-based applications), airborne and terrestrial laser scanning, 3D data editing, web cartography, and Building Information Modelling (BIM), for the integrated management of spatial data and building-related information. Starting this edition, the programme also includes **artificial intelligence** and **machine learning** techniques applied to geospatial data, as well as the use of immersive 3D technologies.

Since its establishment at the Centre for GeoTechnologies in 2004, the programme has attracted graduates, professionals and public-sector practitioners from a wide range of disciplines, including geology, engineering, architecture, agriculture, forestry, archaeology and environmental sciences. Its multidisciplinary approach enables participants to apply geomatics methodologies across numerous fields concerned with the acquisition, management and interpretation of geographic information.

Throughout the programme, students will learn advanced methods for extracting topographic and thematic information from multisource geospatial data and for producing high-quality spatial datasets. Practical activities include the processing and interpretation of remotely sensed imagery with different spatial and spectral resolutions for the generation of Digital Elevation Models (DEMs), orthophotos, stereoscopic models, three-dimensional point clouds and new vector datasets.

The programme combines a solid theoretical foundation with extensive laboratory activities, field surveys and practical applications based on real-world case studies. Upon completion, graduates will be able to design and implement geomatics projects, manage geospatial databases, monitor natural and built environments, produce digital cartography and publish geospatial information through WebGIS platforms, meeting the needs of public administrations, private companies and research organisations.

## Schedule and Duration

January 2027 - January 2028; 788 hours (lectures + practical sessions + laboratories + internship)

## Tuition Fees

Master's tuition fee: **€ 3,700**

The amount is payable in two instalments: the first instalment of € 2,000 (+ € 16 for the electronic stamp duty electronic stamp duty required under Italian law) payable upon enrolment; the second instalment of € 1,700 payable no later than 31 March 2027.

## Language of instruction

Italian. A good command of the Italian language is therefore required.

## Venue of the Master's Programme

Teaching is delivered in blended mode, combining face-to-face instruction with synchronous online learning. All classes are held at the Centre of GeoTechnologies (CGT), University of Siena (Via Vetri Vecchi 34, 52027 San Giovanni Valdarno - AR, Italy). Most lectures are also available through synchronous online delivery.

Activities that require in-person attendance are concentrated over six weekends (Friday and Saturday).

## Recognition of Prior Learning (ECTS/CFU)

Admitted applicants may be granted recognition of previously acquired academic credits (up to a maximum of 25% of the total CFU/ECTS) for prior university-level learning in subject areas relevant to the programme, provided that such learning is appropriately documented. The Teaching Board reserves the right to assess the applicant's prior knowledge and competencies and may require an oral interview or a written assessment where deemed necessary.

## Entry Requirements

To enrol in the First-Level Postgraduate Master's Programme in Geomatics (GEOM) is required at least a first-cycle degree:

- any Italian degree awarded under the regulations prior to d.m. 509/99
- any Italian bachelor's degree classes under d.m. 509/99 and d.m. 270/2004
- any Italian master's degree under d.m. 509/99 and under d.m. 270/2004
- University Diplomas in Industrial Design, Building Engineering, and Territorial Information Systems

Applicants holding an academic qualification awarded abroad may also enrol, provided that, for enrolment purposes only, the qualification is deemed comparable in terms of level, nature, content and academic rights to the Italian qualification required for admission to the Master's Programme.

## Contact Information

**TEACHING SECRETARIAT**:
Training Activities Coordination Office - e-mail master.cgt@unisi.it - Tel. +39 055.9119449

**ACADEMIC CONTACT**:
Prof. Riccardo Salvini - e-mail riccardo.salvini@unisi.it - Tel. +39 055.9119441

**ACCOMMODATION:**
CGT Residence - e-mail collegiocgt@unisi.it - Tel. +39 055.9119457

## Programme Structure

| Disciplinary Area | Learning Activities | Hours | ECTS |
|---|---|---|---|
| **FUNDAMENTALS OF GEODESY AND DIGITAL CARTOGRAPHY** | | **76** | **9,5** |
| | Introduction to Geomatics | 4 | 0,5 |
| | Foundamentals of Geoinformatics | 12 | 1,5 |
| | Fundamentals of Geodesy | 8 | 1 |
| | Digital Cartography | 8 | 1 |
| | Applications of Digital Cartography | 16 | 2 |
| | Satellite Positioning Systems (GPS) | 8 | 1 |
| | Topographic Survey | 20 | 2,5 |
| **SPATIAL DATABASES, AI PROGRAMMING, AND WEBGIS** | | **96** | **12** |
| | Fundamentals of Spatial Databases | 32 | 4 |
| | Applications of Spatial Databases | 24 | 3 |
| | AI Programming: Machine Learning models | 16 | 2 |
| | WebGIS | 24 | 3 |
| **GIS AND AI APPLICATIONS** | | **100** | **12,5** |
| | Fundamentals of GIS | 20 | 2,5 |
| | Applications of GIS | 16 | 2 |
| | Geoprocessing and Geospatial AI | 20 | 2,5 |
| | 3D GIS | 20 | 2,5 |
| | Geostatistics | 24 | 3 |
| **REMOTE SENSING, PHOTOGRAMMETRY AND LiDAR** | | **136** | **17** |
| | Fundamentals of Remote Sensing | 16 | 2 |
| | Practicals of Remote Sensing | 16 | 2 |
| | AI and Remote Sensing | 8 | 1 |
| | Aerial and Satellite Photogrammetry | 40 | 5 |
| | Drone-Based Photogrammetry | 24 | 3 |
| | Aerial LiDAR | 8 | 1 |
| | Terrestrial LiDAR | 24 | 3 |
| **CAD, BIM AND 3D MODELING** | | **80** | **10** |
| | Fundamentals of Building Information Modeling | 8 | 1 |
| | Applications of Building Information Modeling | 16 | 2 |
| | Fundamentals of 3D Editing | 12 | 1,5 |
| | 3D Digital Creation: Editing and Immersive Technologies | 20 | 2,5 |
| | Fundamentals of CAD | 24 | 3 |
| **CURRICULAR INTERNSHIP** | | **300** | **12** |
| | Curricular internship | 300 | 12 |
| **FINAL ASSESSMENT** | | | **2** |
| | Final Dissertation | | 2 |