# Syllabus

## *Course Description*

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| **Course Title** | Environmental Geomatics and Remote Sensing |
| **Course Code** | 40202 |
| **Course Title Additional** | |
| **Scientific-Disciplinary Sector** | AGRI-04/C |
| **Language** | Italian |
| **Degree Course** | Bachelor in Agricultural, Food and Mountain Environmental Sciences |
| **Other Degree Courses (Loaned)** | |
| **Lecturers** | dr. Massimiliano Schiavo, Massimiliano.Schiavo@unibz.it https://www.unibz.it/en/faculties/agricultural-environmental-food-sciences/academic-staff/person/51418 |
| **Teaching Assistant** | |
| **Semester** | Second semester |
| **Course Year/s** | 3 |
| **CP** | 6 |
| **Teaching Hours** | 36 |
| **Lab Hours** | 24 |
| **Individual Study Hours** | 90 |
| **Planned Office Hours** | 18 |
| **Contents Summary** | The course is based on theoretical and practical learning of topics related to Environmental Geomatics and Remote Sensing. The course objectives are to acquire (i) basic knowledge for understanding and using geospatial data; (ii) notions of geomatics, geodesy, and topography; (iii) ability to analyze geospatial information, like geomatics/topographic, environmental, geological, urbanistic, and agronomic data; (iv) basic skills in topographic georeferenced surveying and measurements in the field; (v) ability to process information for the preparation of technical reports. |

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| **Course Topics** | - basics of geodesy, cartography, and topography<br>- use of raster and vector data<br>- analysis of territorial and geospatial data<br>- theoretical foundations and practical application of GPS survey systems and their use in conjunction with territorial data |
| **Keywords** | GIS, geomatics, geodesy, topography, raster data, vectorial data, GPS, territorial datasets |
| **Recommended Prerequisites** | - fundamentals of logic, mathematics, and physics<br>- basic use of Microsoft Excel |
| **Propaedeutic Courses** | no |
| **Teaching Format** | - frontal lectures, pc exercises, field application<br>- didactic material: frontal lectures, slides, blackboard, and personal notes to be taken during the lectures |
| **Mandatory Attendance** | no |
| **Specific Educational Objectives and Learning Outcomes** | Knowledge and understanding<br>- Know the main methods and tools, both optical and digital, of geomatics and remote sensing;<br>- Know the types of existing digital data (optical and LiDAR) and the main methods for acquiring them;<br>- Know how to apply and use geomatics and georeferenced spatial information for land planning and management.<br><br>Ability to apply knowledge and understanding<br>- Know the difference between raster and vector data<br>- Know the properties of raster and vector data, their spatial resolution, and the reference system<br>- Import, manage, and use digital raster and vector data from the main digital data acquisition systems;<br>- Analyze data using free specialized geomatics software (QGIS) and numerical calculations (Microsoft Excel, MATLAB).<br>- Access digital territorial databases, download data, and use them on GIS platforms.<br>- Be able to use basic GPS tools in the field to acquire georeferenced points, use field points for basic topographic and agronomic measurements, and integrate field data with information from databases.<br><br>Making independent judgments |

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| | - Ability to identify methods for acquiring, analyzing, and using geospatial data.<br>- Ability to integrate geomatics, topographic, environmental, geological, urban planning, and agronomic data to prepare technical reports on territorial issues.<br><br>Communication skills<br>- Use technical language.<br>- Ability to structure and implement technical documentation related to project activities.<br><br>Learning skills<br>Ability to independently study and critically evaluate data types and the tools and methods used to collect and process them in territorial analysis. |
| **Specific Educational Objectives and Learning Outcomes (additional info.)** | |
| **Assessment** | written test |
| **Evaluation Criteria** | - Independent judgment, analysis, and evaluation of territorial datasets<br>- Ability to use basic techniques on the QGIS platform and, if necessary, reprocess them in other computing environments<br>- Ability to connect different topics to solve case studies based on real data |
| **Required Readings** | (personal) lecture notes and slides provided by the teacher |
| **Supplementary Readings** | any bibliographical support will be communicated in class by the teacher |
| **Further Information** | |
| **Sustainable Development Goals (SDGs)** | Clean water and sanitation, Affordable and clean energy, Industry, innovation and infrastructure, Life on land, Responsible consumption and production, Climate action, Sustainable cities and communities |