

Mastering Geographic Information Systems (GIS) Training Course

9 – 13 November 2026
Zoom

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Ref: 36266_230124 **Date:** 9 – 13 November 2026 **Location:** Zoom **Fees:** 1500 Euro

Course Overview:

This training course is an intensive program designed to equip participants with complete knowledge and practical skills in Geographic Information Systems. This course delves deep into the fundamentals of GIS, exploring GIScience, GIS applications, spatial data, and geoinformation. Participants will gain a solid understanding of geographic phenomena, spatial analysis, and the management of spatial databases. With a focus on data management in GIS, geospatial data types, and geographic representations, this training course covers essential aspects of GIS software, spatial data infrastructure, and GIS architecture. Attendees will also learn about the latest GIS hardware and software trends, database management systems in GIS, and advanced techniques for spatial query and analysis. The course emphasizes the importance of spatial data presentation, GIS and DBMS integration, and spatial referencing and positioning. Topics such as map projections, coordinate systems in GIS, and satellite-based positioning will be covered in detail. The training also includes modules on data entry in GIS, spatial data input, and ensuring data quality in GIS. By mastering accuracy and precision in GIS, participants will be adept at GIS data preparation, spatial data analysis, and utilizing GIS analytical capabilities. Additionally, the course will address overlay functions in GIS, network analysis, error propagation, and advanced GIS data visualization strategies. The complete curriculum ensures that participants are proficient in mapping techniques, including mapping qualitative and quantitative data, terrain elevation, and time series, culminating in effective map dissemination.

Target Audience:

- GIS Analysts
- Geospatial Data Scientists
- Urban Planners
- Environmental Consultants
- Surveyors
- Cartographers
- IT Professionals in GIS
- Government and Municipal Employees
- Academic Researchers
- Civil Engineers
- Real Estate Developers
- Forestry and Natural Resource Managers
- Emergency Management Personnel

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Targeted Organizational Departments:

- GIS Departments
- Urban Planning and Development
- Environmental Management
- Surveying and Mapping
- IT and Data Management
- Engineering and Construction
- Natural Resource Management
- Emergency Services

Targeted Industries:

- Urban Planning and Development
- Environmental Management
- Oil and Gas
- Telecommunications
- Transportation and Logistics
- Real Estate
- Agriculture
- Forestry
- Mining
- Public Health
- Emergency Management
- Government entities

Course Offerings:

By the end of this course, participants will be able to:

- Define and explain the fundamentals of GIS and GIScience.
- Utilize various GIS applications for spatial data analysis and geoinformation management.
- Manage and organize spatial databases effectively.
- Apply spatial data infrastructure and GIS architecture in real-world scenarios.
- Implement advanced spatial query, analysis, and presentation techniques.
- Ensure data quality in GIS through accurate data entry and preparation.
- Conduct complete spatial data analysis and utilize GIS analytical capabilities.
- Perform network analysis and handle error propagation in GIS.
- Create and disseminate detailed and accurate maps using advanced GIS data visualization strategies.

Training Methodology:

The course employs a blend of interactive training methodologies to ensure a complete learning experience. Participants will engage in case studies that provide real-world GIS applications, enhancing their understanding of spatial data and geoinformation. Group work and collaborative projects will foster teamwork and problem-solving skills. Interactive sessions will include hands-on exercises with GIS software, allowing participants to apply theoretical knowledge practically. Feedback sessions will be conducted regularly to address any learning gaps and reinforce key concepts.

Course Toolbox:

- complete Workbooks
- Reading Materials and Academic Articles
- Case Study Examples

Course Agenda:

Day 1: Introduction to GIS and Fundamentals

- **Topic 1:** The Nature of GIS
- **Topic 2:** Defining GIS
- **Topic 3:** GISystems, GIScience, and GIS Applications
- **Topic 4:** Spatial Data and Geoinformation
- **Topic 5:** The Real World and Representations of It
- **Topic 6:** Models and Modelling
- **Reflection & Review:** Key Concepts and Applications in GIS

Day 2: Geographic Information and Spatial Data Types

- **Topic 1:** Geographic Phenomena: Defining and Types
- **Topic 2:** Geographic Fields and Objects
- **Topic 3:** Boundaries
- **Topic 4:** Computer Representations of Geographic Information
- **Topic 5:** Regular and Irregular Tessellations
- **Topic 6:** Vector Representations, Topology, and Spatial Relationships
- **Reflection & Review:** Understanding Geographic Information and Spatial Data

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Day 3: Data Management and Processing Systems

- **Topic 1:** Hardware and Software Trends in GIS
- **Topic 2:** GIS Software
- **Topic 3:** GIS Architecture and Functionality
- **Topic 4:** Spatial Data Infrastructure SDI
- **Topic 5:** Stages of Spatial Data Handling
- **Topic 6:** Spatial Data Capture, Storage, and Maintenance
- **Reflection & Review:** Effective Data Management in GIS

Day 4: Spatial Referencing and Positioning

- **Topic 1:** Spatial Referencing and Reference Surfaces for Mapping
- **Topic 2:** Coordinate Systems in GIS
- **Topic 3:** Map Projections
- **Topic 4:** Coordinate Transformations
- **Topic 5:** Satellite-Based Positioning: Absolute and Relative Positioning
- **Topic 6:** Positioning Technology: Errors, Network, and Measurements
- **Reflection & Review:** Mastering Spatial Referencing and Positioning

Day 5: Data Entry, Quality, and Visualization

- **Topic 1:** Spatial Data Input: Direct and Indirect Capture
- **Topic 2:** Obtaining Spatial Data from Other Sources
- **Topic 3:** Data Quality in GIS: Accuracy, Precision, and Consistency
- **Topic 4:** Data Preparation: Checks, Repairs, and Combining Multiple Sources
- **Topic 5:** Spatial Data Analysis: Classification, Overlay Functions, and Network Analysis
- **Topic 6:** GIS Data Visualization: Cartographic Toolbox and Mapping Techniques
- **Reflection & Review:** complete Data Quality and Visualization in GIS

How This Course is Different from Other GIS Courses:

The course stands out from other GIS courses due to its complete and practical approach to learning. Unlike standard courses, this program provides an in-depth exploration of both GIS fundamentals and advanced techniques. Participants will benefit from a curriculum that integrates GIScience with real-world GIS applications, ensuring they are well-equipped to handle complex spatial data and geoinformation challenges. Additionally, the training methodologies used in this course, such as interactive sessions, case studies, and group work, create an engaging and dynamic learning environment. This course also includes advanced topics like spatial data infrastructure, GIS architecture, and the latest trends in GIS hardware and software, setting it apart from other training programs. With a focus on data quality, accuracy, and precision, participants will gain the expertise needed to excel in GIS analysis and data visualization. Overall, this course offers a unique blend of theoretical knowledge and practical skills, making it an essential training program for anyone looking to master Geographic Information Systems.