GIS and Spatial Data Analysis for Urban Planning Training Course

14 - 18 Dec 2026

Boston

7500 € (Per Person)

Ref: #CAD5457_84390

Course Introduction / Overview:

This course provides a comprehensive exploration of Geographic Information Systems (GIS) and spatial data analysis as indispensable tools for modern urban planning and management. In an era of rapid urbanization and the rise of smart cities, the ability to analyze and visualize geographic data is crucial for making informed decisions that shape sustainable, efficient, and equitable urban environments. This program moves beyond basic software training to instill a deep understanding of spatial thinking and analytical methodologies. As discussed by prominent urban theorist Michael Batty in works like "The New Science of Cities," understanding cities as complex systems requires powerful analytical tools, a core principle of this course. Participants will learn to manage geospatial data, perform sophisticated spatial analysis, and create compelling cartographic outputs to address real-world urban challenges, from land use planning and environmental impact assessment to infrastructure management and demographic analysis. BIG BEN Training Center has designed this curriculum to empower professionals with the practical skills and theoretical knowledge needed to leverage geospatial technology for strategic urban development and policy-making.

Target Audience / This training course is suitable for:

- Urban Planners and City Planning Technicians.
- GIS Analysts and Specialists.
- Real Estate Developers and Analysts.
- Environmental Consultants and Scientists.
- Public Works and Infrastructure Managers.
- Transportation Planners.
- Public Policy Advisors and Researchers.
- Civil Engineers and Surveyors.
- Emergency Services Planners.
- Public Health Analysts.

Target Sectors and Industries:

- Government and Public Administration (Municipal, Regional, and National).
- Urban and Regional Planning Consultancies.
- Real Estate and Property Development.
- Environmental Engineering and Consulting.
- Architecture and Landscape Architecture.
- Transportation and Logistics.
- Utilities and Telecommunications.
- Construction and Infrastructure Development.
- Non-Profit and Community Development Organizations.

Target Organizations Departments:

- Planning and Development.
- Geographic Information Systems (GIS).
- Public Works and Engineering.
- Environmental Management and Sustainability.
- Transportation and Transit.
- Strategic Planning and Policy.
- Real Estate and Asset Management.
- Research and Analysis.
- Capital Projects and Infrastructure.

Course Offerings:

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

- Master the fundamental principles of GIS and their application in urban contexts.
- Effectively manage and integrate diverse geospatial datasets for planning purposes.
- Perform core spatial analysis techniques, including buffering, overlay, and proximity analysis.
- Conduct site suitability analysis for commercial, residential, and public facility development.
- Analyze demographic and socioeconomic patterns to support equitable urban planning.
- Model and analyze transportation networks to improve urban mobility.
- Create professional-grade thematic maps and data visualizations for reports and presentations.
- Apply GIS for environmental impact assessment and sustainable land use management.
- Utilize spatial data to support the development of smart city initiatives.
- Develop a complete GIS-based urban planning project from data acquisition to final analysis.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, practical, and engaging, ensuring that participants not only learn theoretical concepts but can also apply them confidently in their professional roles. The course blends expert-led instruction with hands-on software exercises, allowing participants to work directly with geospatial data and industry-standard tools. A significant portion of the training is dedicated to real-world case studies drawn from diverse urban environments, providing context and demonstrating the practical application of spatial analysis techniques. Collaborative group projects and workshops encourage peer-to-peer learning and problem-solving, simulating the team-based nature of modern urban planning projects. Interactive sessions, including Q&A periods and open discussions, are integrated throughout the course to foster a dynamic learning environment. Participants will receive continuous feedback from the instructor on their practical work, culminating in a capstone project that allows them to apply their comprehensive skills to a simulated urban planning challenge. This immersive approach ensures a robust and lasting learning experience.

Course Agenda (Course Units):

Unit One: Fundamentals of GIS in Urban Contexts

- Introduction to Geographic Information Systems (GIS) and spatial thinking.
- Understanding vector and raster data models in urban analysis.
- Exploring key coordinate systems and map projections for city mapping.
- Introduction to GIS software interface and core functionalities.
- Techniques for sourcing and acquiring urban geospatial data.
- Fundamentals of geodatabase design for urban planning projects.
- Principles of data quality assessment and metadata management.

Unit Two: Core Spatial Analysis for Urban Planners

- Mastering attribute and spatial queries for data exploration.
- Geoprocessing tools for urban analysis, including buffer and overlay.
- Proximity analysis for accessibility studies (e.g., to parks, schools).
- Using spatial join and relate functions to link disparate datasets.
- Introduction to raster analysis for environmental and land cover mapping.
- Density analysis for visualizing population and crime hotspots.
- Methods for data classification and symbolization in thematic mapping.

Unit Three: Practical Applications in Land Use and Environmental Planning

- Conducting site suitability and selection analysis for new developments.
- GIS techniques for zoning regulation analysis and compliance.
- Mapping and analyzing urban land use patterns and changes over time.
- Environmental impact assessment using spatial data.
- Modeling urban green spaces and their accessibility.
- Watershed and floodplain delineation for risk management.
- Analyzing the spatial relationship between land use and transportation.

Unit Four: Advanced GIS for Smart Cities and Infrastructure Management

- Introduction to network analysis for transportation and utility planning.
- Optimizing routes for emergency services and public transit.
- 3D visualization and modeling of urban environments.
- Integrating GIS with sensor data for smart city applications.
- Managing and mapping public utilities and infrastructure assets.
- Demographic and socioeconomic analysis for policy-making.
- Using GIS for urban growth modeling and scenario planning.

Unit Five: Capstone Project and Advanced Cartographic Communication

- Developing a comprehensive GIS project from start to finish.
- Advanced principles of cartographic design and visual hierarchy.
- Creating compelling map layouts and map series for planning reports.
- Techniques for developing interactive web maps and story maps.
- Effectively communicating spatial analysis results to non-technical stakeholders.
- Exploring future trends in urban GIS, including AI and machine learning.
- Final project presentations and peer feedback session.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

How might the integration of real-time spatial data and predictive analytics fundamentally alter the ethical responsibilities of an urban planner?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by focusing on the strategic application of spatial analysis in urban decision-making, rather than merely teaching software functionalities. While participants will gain proficiency in essential GIS tools, the core emphasis is on developing a "spatial thinking" mindset to solve complex urban problems. We delve into the 'why' behind the analysis, exploring how different methodologies can lead to more equitable, sustainable, and resilient city planning. The curriculum is built around a series of integrated, real-world case studies that mirror the challenges professionals face, from land use conflicts to infrastructure deficits. Unlike generic GIS courses, every module is specifically tailored to the urban planning context, addressing topics like zoning, environmental justice, and smart city integration. Furthermore, the course structure culminates in a capstone project that requires participants to synthesize their skills to produce a professional-level planning analysis, ensuring they leave not just with knowledge, but with a tangible demonstration of their new capabilities and a deeper understanding of the strategic role of geospatial intelligence in shaping the future of our cities.