Training course on Mapping with Geoserver, Postgres, and Openlayers

Professional Development Training Course Outline

Category	GIS	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In today's data-driven world, geographic information system (GIS) technology plays a critical role in how we visualize, interpret, and analyze spatial data. GeoServer, PostGIS, and OpenLayers are powerful tools used to create, manage, and display geospatial data through web-based mapping applications. This training course on Mapping with GeoServer, PostGIS, and OpenLayers is designed to provide you with the skills necessary to implement these technologies and create dynamic, interactive maps that can be used across various sectors, from urban planning to environmental management.

GeoServer is an open-source server for sharing geospatial data, while PostGIS is a spatial database extension for PostgreSQL that stores geographic information. OpenLayers, a web-based mapping library, allows you to embed interactive maps into your web applications. Together, these tools provide a robust platform for developing and serving geospatial data over the web, making it accessible and actionable. This course will give you hands-on experience with each of these technologies, enabling you to develop, manage, and present spatial data efficiently.

Programme Curriculum

Training course on Mapping with Geoserver, Postgres, and Openlayers

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With the rise of location-based services, businesses and organizations need to be able to handle and visualize geospatial data in a meaningful way. This course focuses on creating interactive maps that can display various types of data, such as satellite imagery, terrain models, and vector layers. Learners will understand how to set up GeoServer to serve geospatial data, use PostGIS to store and query geographic data, and utilize OpenLayers to build custom web maps that can be embedded in websites or applications.

Course Duration

10 Days

Course Objectives

1. Understand the principles and benefits of geospatial data and mapping technologies.
2. Learn how to set up and configure GeoServer for serving geospatial data.
3. Gain proficiency in using PostGIS to store, manage, and query spatial data in PostgreSQL.
4. Learn how to integrate PostGIS with GeoServer to serve geospatial data through WMS, WFS, and WCS services.
5. Understand how to use OpenLayers to build interactive web maps.
6. Develop the skills to display multiple types of geospatial data, including vector and raster formats.
7. Learn how to style maps effectively to improve readability and user experience.
8. Gain hands-on experience with integrating various map layers and setting up custom map controls.
9. Understand best practices for optimizing the performance of web-based mapping applications.
10. Gain experience with real-world case studies to apply theoretical knowledge to practical applications.

Organizational Benefits

1. Improved capability to manage and display spatial data using open-source geospatial technologies.
2. Reduced reliance on proprietary mapping solutions by leveraging GeoServer, PostGIS, and OpenLayers.

3. Ability to create web-based mapping applications that support decision-making and enhance data visualization.
4. Streamlined workflows for sharing, editing, and collaborating on spatial data within organizations.
5. Increased efficiency in managing large geospatial datasets, improving data access and retrieval.
6. Cost-effective development of mapping solutions, avoiding expensive software licensing fees.
7. Improved accuracy and quality of geographic data analysis, leading to better decision-making.
8. Enhanced collaboration between departments by providing a centralized platform for spatial data.
9. Ability to scale mapping applications to meet growing data demands as the organization expands.
10. Competitive advantage through the ability to create innovative, custom mapping solutions for clients or stakeholders.

Target Participants

- GIS professionals and analysts looking to expand their knowledge in web-based mapping technologies.
- Developers and IT professionals interested in integrating geospatial data into web applications.
- Urban planners, environmental scientists, and others who need to work with spatial data.
- Database administrators and managers responsible for managing geographic databases.
- Business professionals seeking to enhance decision-making through interactive mapping applications.
- Students and professionals aiming to specialize in geospatial technologies for development or research.

Course Outline

Module 1: Introduction to Geospatial Technologies

1. Overview of GIS and geospatial data concepts.
2. Introduction to GeoServer, PostGIS, and OpenLayers.
3. Understanding the role of web-based mapping in GIS solutions.
4. Benefits of using open-source tools for mapping and spatial data management.
5. **Case Study**: Use of geospatial mapping for urban planning.

Module 2: Setting up GeoServer

1. Installing and configuring GeoServer.
2. Setting up data sources for GeoServer (WMS, WFS, WCS).
3. Configuring GeoServer to serve raster and vector data.

4. Managing layers and styling options in GeoServer.
5. **Case Study**: Creating a basic map service with GeoServer.

Module 3: Introduction to PostGIS

1. Overview of PostGIS and spatial databases.
2. Setting up and configuring PostGIS with PostgreSQL.
3. Basic spatial data types and functions in PostGIS.
4. Importing and exporting geospatial data in PostGIS.
5. **Case Study**: Building a spatial database for environmental data analysis.

Module 4: Integrating PostGIS with GeoServer

1. Connecting PostGIS to GeoServer for spatial data serving.
2. Publishing vector data stored in PostGIS using GeoServer.
3. Configuring spatial queries and filtering in GeoServer.
4. Working with large spatial datasets in PostGIS and GeoServer.
5. **Case Study**: Displaying PostGIS vector data in a GeoServer map service.

Module 5: Using OpenLayers to Build Interactive Maps

1. Introduction to OpenLayers and its capabilities.
2. Embedding OpenLayers in a web page.
3. Integrating GeoServer WMS and WFS layers with OpenLayers.
4. Customizing map controls and user interface with OpenLayers.
5. **Case Study**: Building an interactive map for displaying public data.

Module 6: Styling and Theming Maps

1. Understanding styling options in GeoServer and OpenLayers.
2. Using SLD (Styled Layer Descriptor) for vector styling.
3. Creating and applying custom map themes.
4. Styling raster data for improved visualization.
5. **Case Study**: Designing a thematic map for land use planning.

Module 7: Advanced Geospatial Techniques

1. Using spatial analysis functions in PostGIS for complex queries.
2. Performing spatial joins and buffering in GeoServer.
3. Handling geospatial data projections and transformations.
4. Working with time-based and animated data in maps.
5. **Case Study**: Analyzing transportation networks with spatial queries.

Module 8: Optimizing Web Mapping Applications

1. Best practices for optimizing map performance in OpenLayers.
2. Techniques for improving GeoServer performance with large datasets.
3. Caching strategies for faster map rendering.
4. Load balancing and clustering for web mapping services.

5. **Case Study**: Scaling a web map application for heavy traffic.

Module 9: Security and Data Access Control

1. Securing geospatial data in GeoServer and PostGIS.
2. Configuring user roles and permissions in GeoServer.
3. Setting up secure data access protocols (SSL, authentication).
4. Best practices for protecting sensitive geospatial data.
5. **Case Study**: Securing a map application with restricted access.

Module 10: Deploying and Maintaining Web Mapping Applications

1. Steps to deploy your GeoServer, PostGIS, and OpenLayers applications.
2. Managing data updates and application maintenance.
3. Monitoring and troubleshooting geospatial services.
4. Configuring backup and disaster recovery plans.
5. **Case Study**: Deploying a geospatial mapping application for a government project.

Training Methodology

The instructor led trainings are delivered using a blended learning approach and comprises of presentations, guided sessions of practical exercise, web-based tutorials and group work. Our facilitators are seasoned industry experts with years of experience, working as professional and trainers in these fields.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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