DEVELOPMENT OF WEB BASED GIS APPLICATIONS USING ARCGIS SERVER API 3.X FOR JAVASCRIPT

ONLINE TRAINING
You will learn how to develop web mapping applications using ArcGIS Server API (3.x and 4.x) for JavaScript. Students will learn to insert spatial data in their own Web applications through ArcGIS Server map services. They will be informed about the new released API version 4.x, and about all the new added features and capabilities. They will also learn about the differences between the two versions.

Learn the fundamentals of JavaScript, the most widely used web-based programming language, learn App design and development for iOS products (iPhone and iPad), integrate through advance programming techniques, online web mapping resources like Google Maps or Bing Maps. They will also gain knowledge in the developing 3D cartographic viewers using ArcGIS JavaScript API.

- Learn the fundamentals of JavaScript, the most widely used web-based programming language and how to develop and manage online cartographic viewers.
- Get familiar with ESRI Web GIS technologies in a dynamic and interactive way.
- Create your own Web based GIS Applications using ArcGIS Server and ArcGIS API for JavaScript.
- Get an insight on how JavaScript API is connected with ArcGIS Server in order to share your new developed applications on the web.
- Gain experience in using ArcGIS online resources like ArcGIS Server and ArcGIS Online services.
Enrolled students in this online course will have access to our virtual e-learning platform (which is available 24 hours), where they will find the content of the course, practical exercises, forum discussion and additional content. One of the advantages of this online platform, is that students can benefit of real time support and assistance offered by the instructor (2 hours per week), whom they can contact via direct messages, regarding course related issues, at any moment. They can also contact the instructor via email.

**Methodology**

The course is aimed at professionals of the GIS world who, with knowledge or not of programming, want to know all the possibilities that programming with JavaScript offers.

**Instructors**

**Chencho Martín Lagunas**
GIS Developer with extensive experience in Full-Stack software development, specialized in GIS data analysis and pre-processing using Python.

**Alberto Santos Estévez**
Consultant and Geospatial Developer with more than 15 years' experience in GIS integrated solutions and high performance systems.
INTRODUCTION TO JAVASCRIPT PROGRAMMING LANGUAGE

DEBUGGING APPLICATIONS
What is Firebug?
Using Console and Script tabs
Highlighting HTML Elements
Using CSS tab
Debugging JavaScript code
Error monitoring & reporting
DOM Tab
RED Tab
Documentation

WORKING WITH DOJO AND ARCGIS SERVER
Introduction to Dojo
Dijit
Dojox
Dojo architecture
Integrating Dojo with ArcGIS Server
ArcGIS Server resources
Initialization script
Templates
Dojo base and Dojo core
Type checking
String utilities
Array processing
JavaScript events and Dojo. What are the events?
dojo.connect()
Managing events
Should we record all the events?
Mouse and Keyboard Event Normalization
Publish/Subscribe Event Mechanism

ARCGIS SERVER FOR DEVELOPERS
What is ArcGIS Server?
GIS resources and services
ArcGIS Server components
ArcSDE
ArcGIS Server editions
What’s new in ArcGIS Server 10.1.
What’s new in ArcGIS Server 10.3.1

INTRODUCTION TO JAVASCRIPT API FOR ARCGIS SERVER
Aptana plugin
Short overview of JavaScript API for ArcGIS Server
Why JavaScript?
Working with maps
Tiled and dynamic/feature layers’ services
Working with map extension
Working with graphics and graphic layers
Feature layers
Drawing graphics and elements
Map events
Info window
Adding toolbars
Controls (widgets)
Editing
Design a basic application
ArcGIS templates
API configuration parameters

ADVANCE TECHNIQUES USING JAVASCRIPT API FOR ARCGIS SERVER
Introduction to ArcGIS Server tasks
Performing Spatial and Attribute Queries
Identifying Entities
Finding elements
Perform geocoding and reverse geocoding
Geometry Service
Route Task and Network analysis services
Geoprocessing services
Working with spatial data
Multiple types of layers
arcgis.com integration
Using proxy with ArcGIS API for JavaScript
Working with secure services

GOOGLE AND BING MAPS INTEGRATION
ArcGIS Server extension for Google Maps
Add an ArcGIS Server Dynamic Map Service to Google Maps
Creating a query layer
Search features
Identify features
Geocoding
Geometry Service
Geoprocessing services

ADVANCED RESOURCES OF DOJO
Introduction
Accessing Multiple Data Formats with the Dojo
Data API
Working with JSON
Reading JSON Data with Dojo
Working with XML Data
How to read CSV file
Ajax for client-server communication
dojo.xhr
Cross Domain Scripting Issues & JSONP
Using Iframe
JSON-RPC
User interface manipulation using DOM
Display a simple dialog box and store input data from user
Advanced Dijit Selects with Dojo
Create dynamic graphs and charts using Dojo
Display Image with Dojo

ADVANCED DESIGN TECHNIQUES FOR MAP APPLICATIONS
User-centered design (UCD)
KISS Design principles
Prototypes

INTRODUCTION TO USER INTERFACE DESIGN. CSS BASICS
What is User Centered Design?
CSS Syntax
Comments in CSS
ID selectors
Class selectors – CSS
External Style Sheet
Internal Style Sheet
How to add CSS styles to HTML code
Cascading Style Sheets
CSS Backgrounds
CSS Text
Font styles
Link styles
List styles
Use an image as a list marker
Table styles
Design better data tables
CSS Box Model

ADVANCED STYLING WITH CSS
Grouping Multiple CSS Selectors in One Style
Property
CSS Display and Visibility
CSS Sizing
CSS Positioning
Overlapping elements in CSS
Floating Elements with CSS
CSS Image Transparency
CSS image hover effects

USER INTERFACE DESIGN FOR IPHONE AND IPAD
Compact development (compact build)
Initializing Display Parameters
iOS Gestures
Map interaction using IOS gestures
API Geolocation
Dojox.mobile

FINAL PROJECT
INTRODUCTION TO THE NEW JAVASCRIPT API VERSION 4.X
What are the new features added in the new version?
Restrictions
Practical Exercise 1: Where to find API help documentation and practical examples?

CONSTRUCTORS PROGRAMMING
What is a constructor in programming?
Constructor proprieties
Collections
Promise Object
Practical exercise 2: Proprieties.
Practical exercise 3: Working with Promise object.

MAPS, VIEWS AND LAYERS
Maps and Views
The new API version, MapView, SceneView and LayerView
Maps as a data sources
Web Mapping: Building Great Web Maps and manipulate data
Maps and Layers. Types of Layers:
• GraphicsLayer
• FeatureLayer
• MapImageLayer
• SceneLayer
• VectorTileLayer
• GroupLayer
How to access feature data via LayerView object?
Working with FeatureLayer object
Practical exercise 4: Create a 2D map.
Practical exercise 5: Create a web map.
Practical exercise 6: FeatureLayer access.
Practical exercise 7: Working with VectorTileLayer.

WORKING WITH 3D SCENES
Scenes and Web Scenes. How to add a Web Scene to your application?
Use Topographic Elevation Data to Create a 3D Map
Edit the Scene View: Camera & Environment
• Display Sun and Shadows
• Local Scenes
How to add Scene layers?
3D representation and symbology. Use of Visual Variables
Symbologies

CONCLUSIONS