ARCGIS ARCOBJECTS AND VISUAL STUDIO

ONLINE TRAINING
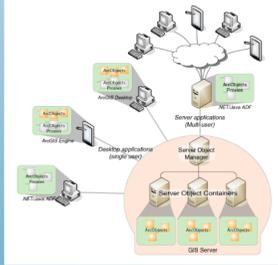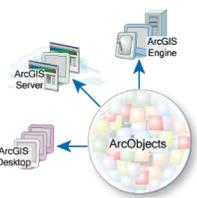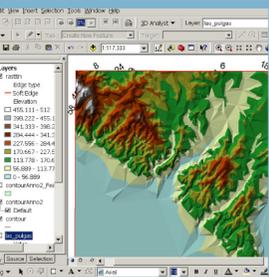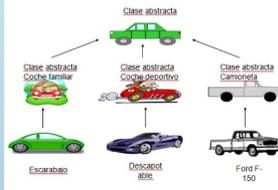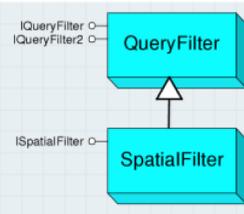
COURSE

This course will introduce the students in the use of ESRI's ArcObjects programming framework. Together with Visual Basic for Applications, it allows developers to improve the functionalities of ArcGIS and create more and more sophisticated applications.

ArcObjects is a development environment of ArcGIS suite of software, it is a library of COM, components that build up the foundatio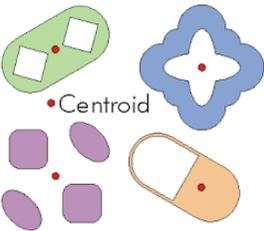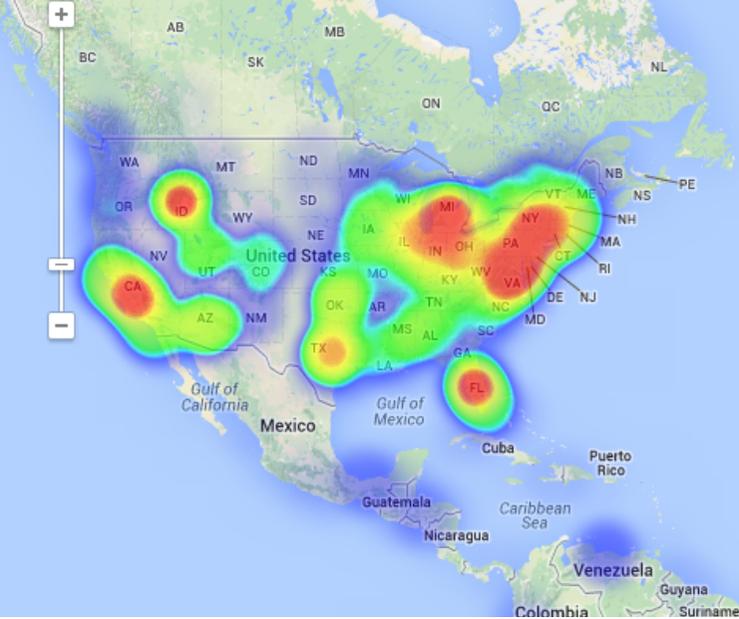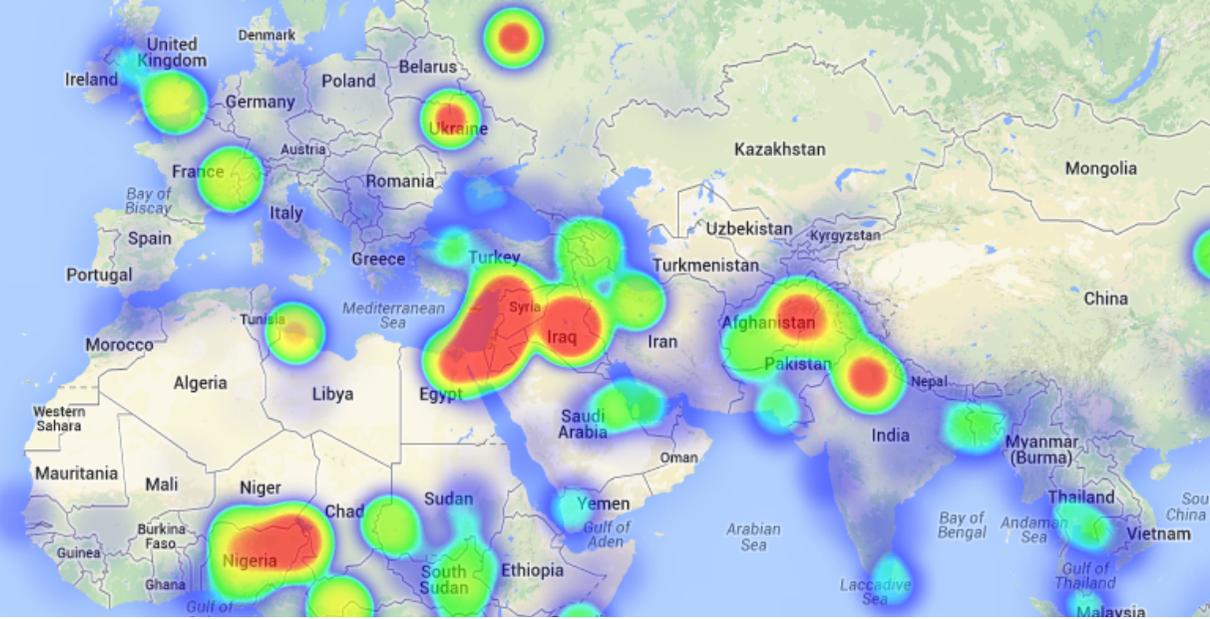n of the Esri's ArcGIS platform. All the ArcGIS for Desktop applications are based on ArcObjects. To start programming in this environment, the best option would be the use of Microsoft Visual Basic programming language.

GOALS

- Introduce the students to ArcObjects, a development environment, on which all ArcGIS for Desktop applications are based.

- The course provides notions of development in Visual Basics, a Microsoft programming language, offering a complete introduction in its capabilities and functionalities.

- Develop new tools and Add-Ins applications that can be used in ArcGIS suite of software.

- Learn about object oriented programming, data models, interfaces and classes used in ArcObjects.

- Understanding the advantages of Visual Basic programming language through practical exercises, which will provide an extensive overview over the different processes and functions that can be integrated with ArcGIS.

ArcGIS, QGIS, IIWIS
Photomodeler, ENVI, LIDAR
Teledetección clásica y DRONES

Teledetección y LIDAR aplicados al medio ambiente, medio marino, agua, recursos hídricos, ordenación territorial, agricultura, medio forestal, etc.
MDT y Ortoimágenes con Drones, etc.

Cursos
TELEDETECCIÓN

SATÉLITE, LIDAR Y UAV/DRONES

CAD y 3D

CAD, BIM, DISEÑO 3D, MICROSTATION Y RETOQUE FOTOGRÁFICO

Catálogo de cursos de programas CAD, BIM y Diseño 3D que disponemos tales como AutoCAD (Clásico, Civil, Map), Revit, 3DS Max, Microstation, etc.

Ver Cursos

GIS

Sistemas de Información Geográfica

Catálogo de cursos de programas de Sistemas de Información Geográfica (GIS) tanto gratuitos (QGIS y GvSIG) como de privativos (ArcGIS Desktop) que disponemos. Los cursos están enfocados a trabajos de escritorio como a programación (Python y JavaScript) y generación de aplicaciones (ArcGIS Server, Opengeo Suite).

Ver Cursos

TELEDETECCIÓN

SATÉLITE, LIDAR Y UAV/DRONES

Catálogo de Cursos de teledetección, incluyendo LIDAR y Drones o UAV, con software libre (QGIS, ILWISS) y privativos (ArcGIS, Photomodeler).

Ver Cursos

METHOLOGY

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.

PERFILES

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 Visual Studio 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.

PROGRAM

## INTRODUCTION TO ARCOBJECTS, ARCGIS EXTENSION

History of ESRI programming
Advantages and disadvantages
Customizing ArcObjects programming framework

Practical exercise 1: Create a custom zoom button in ArcGIS

BASIC PROGRAMMING PRINCIPLES

GIS data access and manipulation, add layers, edit proprieties and table attributes
How we do declare the variables
Constants
Enumerations
Declaring variables and constants
Expressions
Operators
Programming Statements
Putting comments in code
Matrices
Code reuse
Functions
Classes and Modules
Variables scope
Forms
Control proprieties: Control-textbox, ComboBox

Practical exercise 2: Adding a description to a form field, create a toolbar, modifying field properties, set proprieties for a field.
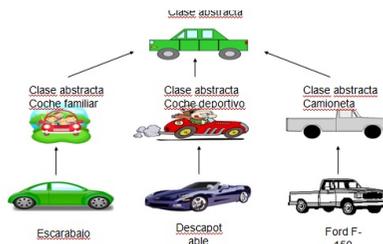
OBJECT ORIENTED PROGRAMMING

Programming style
Object-Oriented Programming Principles
Create a new instance of an object
Interfaces
Object hierarchy
Collections of objects
Access Members of an Object
Objects in ArcGIS
Declare an object
Explicit conversions
Object model diagrams (OMD)

Practical exercise 3: Creating object model diagrams

WORKING WITH MAP DOCUMENTS

Application and document objects
Hiding or displaying the status bar
Progress bar
Setting map document properties
ActiveView
Output parameters
Map
Graphic elements
Adding a marker element to the map
ArcObjects colors
Code modulation

Practical exercise 4: List the graphic elements in a map document

WORKING WITH LAYERS

ArcObjects Object Model
ILayer
iFeatureLayer2
Accessing Feature Layers
Working with enumerations
Types of Operators
Working with group layers
ArcObjects data model
IFeatureClass
Cursors
Resource Management
IFeature
Boards
Access classes
Get Field Value
Fields
Create a new custom field from scratch

Practical exercises 5: Add graphics to layers; Add XY data to a polygon.

WORKING WITH GEOMETRIES

IGeometry
Point
IPoint Interface
Creating a point feature
How to create AWARE points?
ArcObjects Geometry Object Model
Interfaces: IPath, IPolyline6, IPointCollection4, IGeometryCollection, IRing, IPolygon4, IPolycurve2
Access feature geometries and graphic elements
IFeature.Shape vs. IFeature.ShapeCopy
Spatial reference: ISpatialReferenceFactory Interface

Practical exercise 6: Building a geometric structure

# PROGRAM

WORKING WITH GEOMETRIC OPERATIONS

Introduction
What is a geometry operation?
IArea Interface
Other types of operators
Topological operators
ITopologicalOperator Interface
IRelationalOperator2
IProximityOperator

Practical exercise 7: Creating a buffer around a feature, sum of areas

INTERROGATIONS (QUERIES) AND SELECTIONS

Three types of queries
IQueryFilter
SQL examples
SQL questions
ISQLSyntax interface
Other resources
ISpatialQuery
What can you do with a Query Filter?
ISpatialQuery example
Working with Selections
IFeatureSelection
ISelectionSet

Practical exercise 8: Using spatial filters to control areas calculations, Update texts in maps
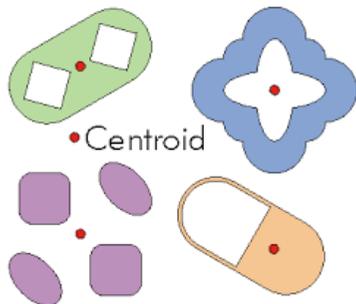
OBTAIN ACCESS TO THE DATA

The architecture of a geodatabase
File Geodatabase in ArcObjects
IFeatureWorkspace interface
IDataset interface
IFeatureClassContainer interface
Dataset Objects
Dynamic layers, dynamic workspaces
IWorkspaceFactory Interface
Types of workspace factories
Working with shapefiles
Opening a feature class in a geodatabase
Add a feature class to a map

Practical exercise 9: How to access local data?

WORKING WITH RASTERS

The raster data model
IPnt interface
IRasterProps interface
IRaster interface
IRaster2 interface
IRasterEdit interface
IPixelBlocks interface
IRasterBandCollection interface
IRasterDataset2 interface
IRasterWorkspace2 interface
Raster Access
Reading & Writing Cell Values

Practical exercise 10: Obtain an elevation profile over a predefined line
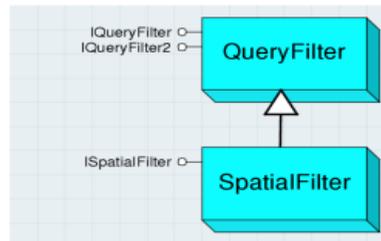
OTHER APPLICATIONS AND USEFUL TOOLS

ArcObjects Geoprocessing
How to use the Geoprocessor
Geoprocessor examples
Working with time-aware layers
Software products life cycles
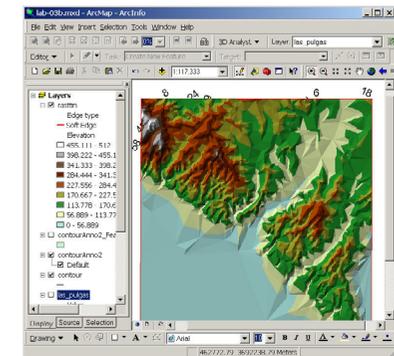
TYC **GIS**
Training

GIS
Course.com

📞 (+34) 910 325 482

✉️ training@tycgis.com

Calle Fuencarral 158,
Entreplanta, Oficina 16-17
28010 Madrid

TYC GIS MÁLAGA
Avda. Pintor Joaquin Sorolla 137, 1° D
29017 MÁLAGA

TYC GIS MÉXICO
Tequesquitengo 4, Fracc. Cuaunáhuac
C.P. 62450,
Cuernavaca, Morelos.

TYC GIS PANAMÁ
Calle Eusebio A. Morales
El Cangrejo
PH Neo Plaza Oficina 2015