QGIS PLUGIN DEVELOPMENT WITH PYTHON
ONLINE TRAINING
The course will provide training in the use of pyQGIS, with a special focus on the development of QGIS plugins.

The student will learn how to develop a plugin, how to manage the IDE, how to debug Python code. At the end of the course each student will have to develop their own QGIS plugin and learn how to publish it on the official QGIS Plugins Repository.

**COURSE GOALS**

- Learn from scratch about capabilities and functionalities QGIS, pyQGIS and PyQt API offer.
- Demonstrate through practical examples the basic methods and functionalities of PyQgis and PyQt.
- Find out about the key tools that can be used in the WEB GIS development environment.
- Get help and guidance in the development process of a QGIS plugin and learn how to disseminate the information.
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 PyQGIS offers.

**Instructor**

Francisco José Raga López

Cartographer and Geodetic Engineer specialized in GIS at Polytechnic University of Valencia, with more than 5 years of experience in GIS related software development projects using QGIS, in Spain as well as overseas. Francisco is one of the best professional expert in this field. He also has training experience due to his involvement in teaching different GIS related courses in private organizations and companies.
INTRODUCTION TO PYQGIS AND PyQt
- Introduction to QGIS
- Introduction to PyQGIS and PyQt
- PyQGIS modules
- PyQt modules
- Python console
- Python Plugins

LOAD DATA THROUGH PYQGIS
- How to create and load a new project
- Loading vector data
- How vector data is organized
- Loading raster data, refresh/update a raster file, display raster data file

USING VECTOR DATA
- Layer attributes - working with the Attribute Table
- Working with selected features records
- Iterate through layers
- Add/Delete new records to an existing layer
- Access geometry
- Project layers in different projection systems

GEOPROCESSES
- Basic concepts about geoprocesses
- List of geoprocesses and help documentation
- Using Python console to execute geoprocesses

USING CANVAS
- Introduction to Canvas
- Using map tools along with Canvas
- Map rendering and printing
- Simple Rendering
- Simple Composition

DEVELOPMENT ENVIRONMENT
- Configuring a IDE on Windows and start debugging

PLUGIN DEVELOPMENT
- Basic structure of a plugin

QT DESIGNER USER INTERFACES
- Designing and building graphical user interfaces with Qt Designer
- Connecting events
- Resource files
- Compile GUIs created with Qt Designer

UPLOADING YOUR PLUGIN
- Name and metadata
- Code and help documentation
- Official repository of QGIS Plugins

FINAL PROJECT
- Develop a plugin at choice.
  Chose one from the following plugin development ideas and customize it after your own will:
  Create a graphic interface that takes as input two vectors, perform simple geoprocessing analysis (intersection, union, etc.), the result can be added or not to the canvas.
  Create a plugin that takes data from the canvas and makes a printout, using a previously created template.