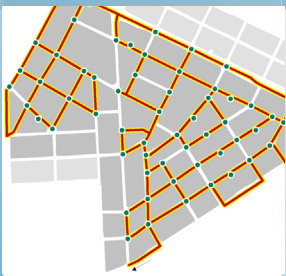
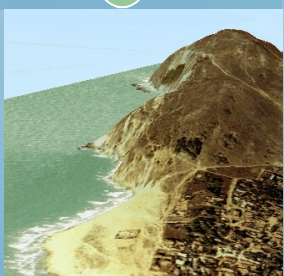
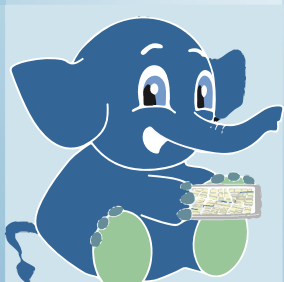
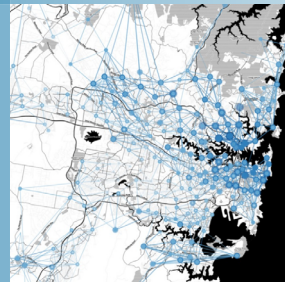
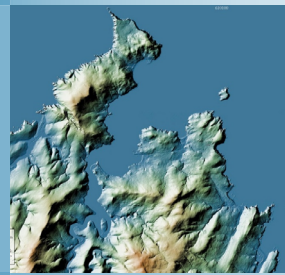
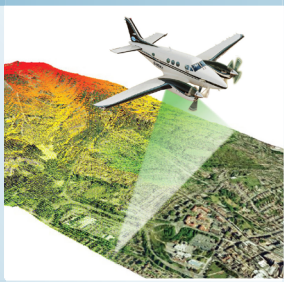
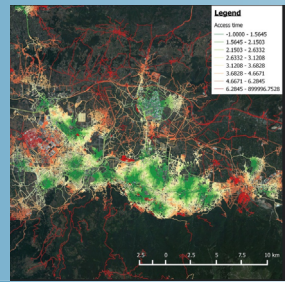
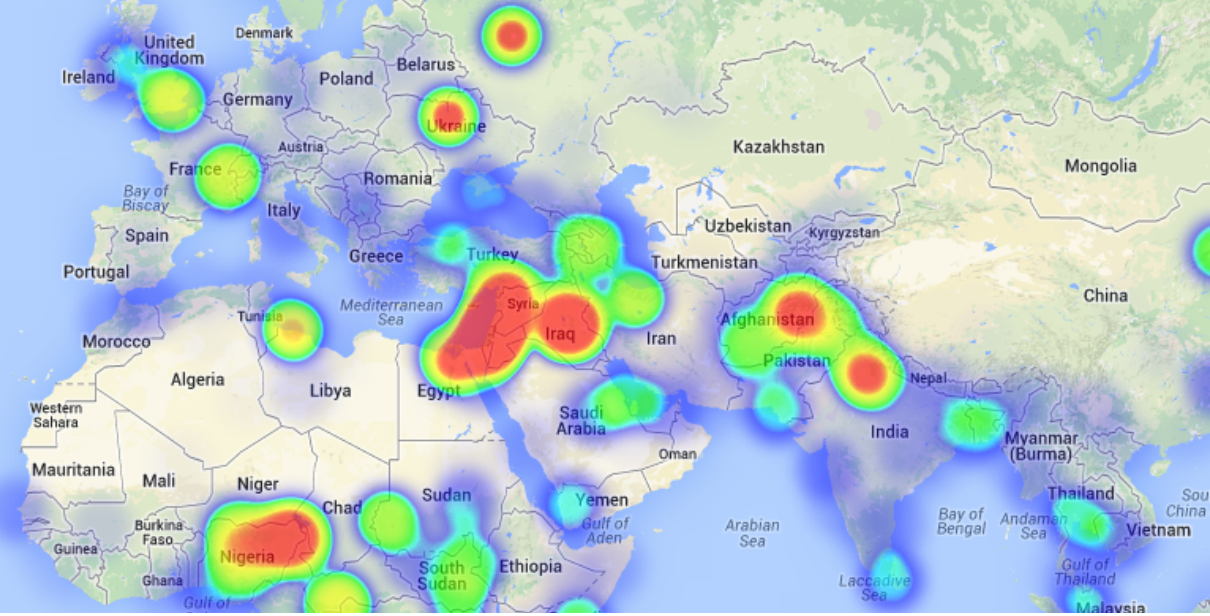
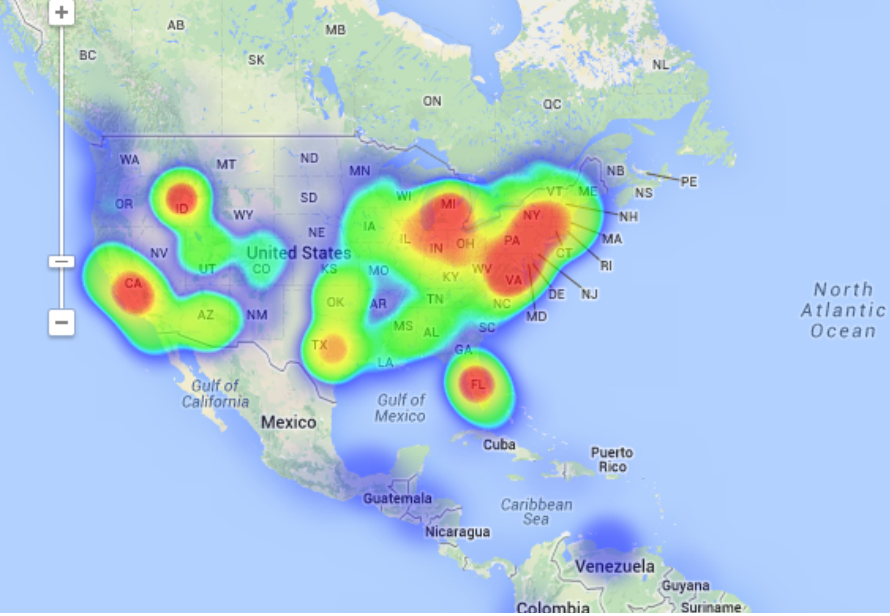


QGIS AND GRASS ADVANCED LEVEL ONLINE TRAINING





COURSE



Intended for users already familiar with the basics of QGIS, who wants to improve their skills, this course is focusing on advanced analysis regarding the management and manipulation of raster data, spatial analysis, using PostGIS and relational databases, performing analysis using Python programming language, network analysis and LIDAR data handling.

The course is structured in units with different levels of difficulty that comes in help of the student who will learn to handle the advanced QGIS tools, from complex multicriterial analysis to optimal route calculations and programming with Python.



GOALS



- Highlight the importance and utility of a Geographic Information System (GIS), especially in the elaboration of complex spatial analysis with applicability in engineering design, topography, geology, hydrology.
- Understand the advanced concepts of QGIS and GRASS GIS.
- Learn about GIS key tools in an appropriate and professional way, create topologies for vector editing, network analysis for finding the best route, closest facility, service area around a location.
- Find about all possible difficulties which you may encounter in the execution of GIS projects, and their solutions through practical advanced exercises.
- Start programming with Python and develop your own complex tools to facilitate your work.

INSTRUCTORS



Alfonso Noriega Díaz

With a Bachelor's Degree in Environmental Sciences and a Master in Safety, Hygiene and Ergonomics from University of Almeria, Alfonso has an extensive experience in GIS/CAD and topography training programs. His expertise extends also on private sector as he worked as a co-director in final career projects and PRL Technician during the construction of "Helios Campos de San Juan I y II".



Ricardo García Álvarez

With a Bachelor's Degree in Geography from Autonom University of Madrid and a Master in Geographic Information Systems from Pontificia University of Salamanca, Ricardo is a Specialist in GIS/Remote Sensing business, with more than 15 years of work experience.

His area of expertise extends over transport networks project management, spatial accessibility studies with GIS, sustainable urban mobility plans, traffic studies (macro and micro simulation) and cartography products development (orthorectification, digital restitution and photogrammetry consulting). As an instructor he is responsible for the training program in different private companies like Tragsa (Tragsatec Group) or Prointec (Indra Group).



Beatriz Ramos López

Beatriz holds a Bachelor Degree in Biology at University of Sevilla, a Master in Geographic Information Systems and another one in Geographic Information Technologies, both of them at the University of Alcalá. She has experience in the execution of Web GIS related projects, in the usage of open source software products and in the development of cartographic viewers.



METHODOLOGY

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.



STUDENT PROFILES



The course is aimed at students and professionals in Engineering, Architecture, Biology, Geography, Geology and Environmental Sciences who are interested in the application of Geographic Information Systems in their present or future professional activities.



RELATIONAL DATABASE MANAGEMENT SYSTEMS AND SPATIAL DATA.

Database design
Database connections, Table joins
Spatial joins, generate new statistics and new data using table and spatial data information

POSTGRESQL and POSTGIS

Different types of data that can be included in a database
How to install PostgreSQL. How to use PostGIS in OpenGeo Suite
Create and manage data in PostGIS
How to handle PostGIS in OpenGeo Suite. Import and export shapefiles (layers)

Practical Exercise 1: Creation and management of Databases.

SPATIAL ANALYSIS USING VECTOR DATA

Geo-processing tools for vector analysis
Generating sampling grids
Multicriterial analysis

Practical Exercise 2: Generating sampling grids for the study of population evolution and density.

Basic operations with raster data
Conversion tools: Raster, Vector, ASCII, KML.
Generate digital models of elevation using vector data, ASCII and TIN files.
Querying and masking raster data for obtaining new information
Merging raster files

Practical Exercise 3: File conversion and Digital Terrain Models development.

ADVANCED SPATIAL ANALYSIS USING RASTER DATA

Reclassify rasters, euclidean distances, boolean operations on layers, raster aggregation and data conversion
Map algebra (Raster calculator), mathematical operations between rasters, cell statistics
Data interpolation techniques (IDW, kriging, natural neighbor)
Contour, slope, hillshade, aspect and visibility maps
Hydrological study: drainage networks, flow direction, watershed basins, catchment areas
Performing Multicriteria raster analysis, basic concepts and weights (the most important component of the MCDA model), weighted layers' combination, non-compensatory

analysis, least cost path analysis

Practical Exercise 4: Viewshed Analysis, hydrological analysis and advance multicriteria analysis.

3D VISUALISATION

Convert 2D data to 3D data
Generate 3D profiles
3D Visualisation of raster and vector data
Map animations
Practical Exercise 5: 3D scene generation.

NETWORK ANALYSIS USING PGRROUTING

Graph Generation
Introduction
Network elements
Impedances
Necessary attributes



Length (Distances)
Speed
Time
Address (one way)
Cost/reverse cost

RDBMS PostgreSQL/PostGIS
Topology
Graphs
PostGIS

Routing calculations with the QGIS
Pgrouting tool
Simple route
Calculating shortest routes with pgRouting.
pgr_Dijkstra
pgr_kDijkstra
pgr_aStar
pgr_drivingDistance
computation of Isochrones pgr alphaShape

Practical Exercise 6: Routes calculation with pgRouting.



PYTHON PROGRAMMING LANGUAGE (PYQGIS)

Variables, data types, reserved words, operations to perform
Lists, tuples, dictionaries, classes
Loops and conditions
How to integrate Python in QGIS
PYQGIS and PYQT. Two APIs for QGIS
What is an API and what does it include?
Step by step explication of code components
Functionality of pyQGIS
Functionality of pyQT

LIDAR DATA MANAGEMENT IN QGIS

QGIS and Lidar. LSTOOLS

How to install LSTOOLS for QGIS
Configuration
2D and 3D visualization for Lidar data

QGIS and Lidar. FUSION
How to install FUSION for QGIS
Configuration

Processing Lidar data in QGIS
DEM Generation
Relief maps
Slope maps

DEVELOPMENT OF A CARTOGRAPHIC VIEWER IN QGIS

What is a cartographic viewer?
Plugins tools in QGIS for viewer development
QGIS Cloud

EVALUATION: DEVELOPMENT AND PUBLISHING OF A CARTOGRAPHIC VIEWER ON THE WEB. USE OF SOCIAL NETWORKS



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, 1º 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