COURSE OUTLINE

This classroom based course builds on the delegates existing knowledge of QGIS. It comprises a series of presentations, demos and computer practical sessions using FREE open source GIS software. The example datasets are taken from a variety of fields.

Delegates are introduced to advanced analysis techniques using both raster and vector data. The course includes a basic introduction to the PostgresQL/PostGIS enterprise database as well as the Python programming language. The course is designed for existing users of QGIS that want to expand their knowledge and carry out higher-level analysis.

This course is intended for those who have either completed our Introduction to QGIS course or have equivalent knowledge and experience.

ANTICIPATED COURSE OUTCOMES / ACHIEVEMENTS

Aims and objectives

- To develop delegates understanding of the fundamental concepts of GIS including its strengths and limitations.
- To expand on the concept of Open Source software
- To introduce the more advanced functionality of QGIS software package.
- To teach the advanced skills needed to obtain, import, manipulate, analyse, interpret, manage and output spatial data in order to investigate topics in the delegate’s area of interest.
- To demonstrate real-world uses of GIS.

Learning outcomes - by the end of the course, delegates will have a knowledge and understanding of:

- Working with spatial databases including importing existing data sets.
- Manipulating coordinate systems in QGIS.
- Advanced field calculations.
- Working with topologies.
- Vector processing including tools such as union.
- Raster processing and how to use the raster calculator.
- Graphical Modeller.
- PostGIS databases.
# Advanced QGIS Classroom based

## Session 1: Group training
**9:30 – 4:30**

<table>
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<th>Session</th>
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| 1 – Spatial databases | Recap on GIS data types  
SpatiaLite databases  
PostgreSQL / PostGIS  
ESRI file geodatabases  
Shapefiles & GeoPackages  
Creating drop down menus (Value Map)  
**Exercise 1a – SpatiaLite databases**  
**Exercise 1b – PostGIS databases** |
| 2 – Manipulating coordinate systems in QGIS | Fundamentals of coordinate systems  
Datums  
Parameters in QGIS  
What system is best?  
**Exercise 2 – Manipulating coordinate systems** |
| 3 – Introduction to Python | Python as a language  
Python in QGIS  
Console  
Syntax  
Pitfalls  
**Exercise 3 – Introduction to python in QGIS** |
| 4 – Advanced Field Calculations, Expressions and Actions | Field Calculator refresher  
Advanced Field calculations  
Functions  
Expressions  
Actions  
**Exercise 4 – Field calculation** |
| 5 – Advanced Editing | Editing recap  
Snapping  
Feature topology  
Topography checker  
Reshaping features  
Advanced digitising (CAD style)  
Forms and Field widgets  
**Exercise 5 – Advanced digitising** |

## Session 2: Group training
**9:30-4:30**

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| 6 – Advanced Symbologies, Labelling and Presentation of data | Labelling using expressions  
Data defined labelling  
Matching label colour to features  
Setting label properties  
Label engine  
Label priority  
Creating an Atlas and dynamic maps  
**Exercise 6a – Advanced symbologies and Presentation of data**  
**Exercise 6b – Creating an Atlas** |
| 7 – Vector processing in QGIS | Processing framework  
Bath processing  
Geoprocessing tools  
**Exercise 7 – Spatial analysis case study** |
| 8 – Raster processing in QGIS | Raster menu  
Raster calculator  
Interpolation  
Using GRASS  
**Exercise 8 – Interpolation and raster algebra** |
| 9 – Graphical Modeller | What is Graphical Modeller?  
Defining inputs  
Algorithms  
Saving and loading a model  
Editing a model  
Documenting a model  
**Exercise 9 – Graphical modeller** |
| 10 – GIS Clinic | Time to discuss GIS topics and questions of interest to the group with the Trainer |

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