**GeoData**

**Advanced QGIS Online**

**COURSE OUTLINE**

This online 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.

The course is run via a series of zoom video calls.

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**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.

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All of our courses are validated under the Association for Geographic Information CPD scheme.
<table>
<thead>
<tr>
<th>Session</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Session 1:</strong> Connection check</td>
<td>This is a short session to test your zoom connection and to ensure you have correctly installed QGIS on your computer.</td>
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**Session 2: Group training**

9:30 – 4:30

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
- Topology checker
- Reshaping features
- Splitting features
- Advanced digitising (CAD style)
- Forms and Field widgets

Exercise 5 – Advanced digitising

**Session 3: Group training**

9:30–4:30

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