

Gter srl usually provides two kind of training courses (in italian): QGIS basic usage and QGIS advanced usage. Both are usually carried out in three days (24 hours).

The **QGIS basic usage (from 16 h to 24 h)** course consists in:

- The basics of GIS
- Introduction to Numerical Cartography and Spatial Reference System (SRS)
- Introduction to Open Source Software and QGIS
 - installation procedures for different operating systems
 - introduction to the different versions of QGIS
 - user interface customization, configuration of the work environment; what's new in version 3.x (compared to 2.18 LTR)
 - SRS management
 - introduction to supported data formats, raster and vector, and their management in QGIS (import, export, styles, rendering, etc.)
- Introduction to the topic of QGIS plugins and their management (choice, research and installation)
- Description and usage of the main plugins
- OGC services (WMS - WFS - WCS) and how to access them from QGIS, loading of base maps (OSM, Google, Bing, ecc.) and data from the web
- Creation of shapefiles from tables (alphanumeric data) and through editing; spatial editing operations; advantages and limitations of the shapefile
- Analysis of other types of vector data: Gepackage, SpatialLite and PostgreSQL / PostGIS
- Example of connection to PostgreSQL / PostGIS; import/export on DB; join between spatial and alphanumeric data
- Management of tables: queries, selections and filters based on attributes; table editing through expressions (Field Calculator); creation and modification of fields (widgets)
- Examples of data entry with forms and data visualisation
- Statistics and graphs about attributes
- Set up of project print layouts
- Print layout and layer style; labels and their manual and automatic positioning; use of the atlas print function

The **QGIS advances usage** course can be divided in modules and consists in:

- **Module 1 (from 6 h to 8 h) – QGIS and PostgreSQL / PostGIS**
 - Introduction to relational databases
 - PostgreSQL: introduction, installation and configurations
 - Data format; PostGIS extension; database structure
 - Management of DB PostgreSQL / PostGIS with QGIS
 - Connection to PostgreSQL / PostGIS; import and export data
 - Management of tables with the QGIS DB Manager plugin
 - Joins and relations between vector data and tables
 - SQL queries; ST_ functions of POSTGIS; creating views (spatial queries)
 - Editing of PostgreSQL / POSTGIS tables with QGIS, fields computation (domains and lists)
 - Introduction to SpatialLite and comparison with PostgreSQL / PostGIS
- **Module 2 (from 4 h to 8 h) – Advanced Vector Analysis and Editing**
 - Advanced geoprocessing of vector data
 - Topology check and error handling
 - Topological editing
 - Management of tables: queries, selections and filters based on attributes; table editing through expressions (Field Calculator); creation and modification of fields (widgets)
 - Examples of data entry with forms and data visualisation
 - Statistics and graphs about attributes
- **Module 3 (from 6 h to 10 h) – Advanced Raster Analysis**
 - Operations with rasters such as reprojections, conversions, clip, merge, virtual rasters; strategies to improve performance (speed and disk space); customized styles and rendering
 - The georeferencer tool of QGIS; Ground Control Points and transformation settings; error evaluation
 - Tiling of raster data
 - The mapAlgebra and the raster calculator
 - Raster reclassification
 - Geomorphological analysis (DTM); 3D spatial modeling; contour lines, slope, aspect, shading maps;
 - Interpolation tools from point data and generation of raster maps; smoothing, distance analysis, zonal statistics



- **Module 4 (from 4 h to 8 h) – QGIS and Lizmap Web Client for the publication on the WEB**
 - Management and publication of web services through QGIS
 - OWS geoservices (WMS, WFS and WCS) and their management in QGIS
 - QGIS Server and Lizmap Web Client
- **Module 5 (from 4 h to 6 h) – QGIS and QField**
 - QGIS project creation and data management for QField
 - The QfieldSync Plugin – data import/export
 - QField Basic usage
- **Module 6 – QGIS Advanced Case Studies**
 - Introduction to statistics and geostatistics with R using QGIS
 - Basics of hydrological analysis
 - Basics of network analysis
 - Introduction to automatic classification of remote sensing images (Semi automatic classification Plugin / Grass tools in QGIS)