

**Course offered for the PhD program
in Civil, Chemical and Environmental Engineering
Curriculum in Fluid Dynamics and Environmental Engineering
a.a. 2017/2018**

(possibility of participation for students in other PhD cycles or other PhD courses)

1. Title

Consultation and analysis of geographic data using GIS software

2. Course Description

The Geographic Information System (GIS): operating logic and basic functionality, overview of application fields, the main existing software (in particular free and open source).

Reference systems and map projections: definitions and features of the most common ones, the EPSG standard codes, the process of geo-referencing.

Numerical cartography: an outline of acquisition methods, conceptual and logic data models, the spatial, semantics and topological components, nominal scale and resolution, metadata and the INSPIRE European Directive, the official Italian cartography.

Digital Terrain Model (DTM): features and data structures, planimetric and altimetric precisions, an outline of interpolation methods for their production; digital models derived from LiDAR survey: acquisition modes, resolutions, strengths and difficulties of use.

Digital image: principles of photogrammetry, the orthorectification process, characteristics of aerial and satellite images.

GeoDataBase: definitions and structure of relational DataBase, SQL queries, the space component and the interaction with GIS software.

GeoWebService: characteristics and methods of use of web services for sharing and distribution of geographic data; main cartographic portals; the OpenStreetMap project.

Free e Open Source Software: main features of QuantumGIS and GRASS GIS; consultation and simple analysis of geographic data through QuantumGIS.

3. Course Organization

The course consists of lectures and a brief computer exercise.

4. Teacher

Bianca Federici

5. Duration and credits

12 hours, 2 credits

6. Activation mode and teaching period

The course is activated every two years; the next one will be held in September 2018.

Registration and information via email: bianca.federici@unige.it

7. Deadline for registration

Registration within the end of July 2018.

8. Final exam

The final examination will be an oral presentation of a theoretical deepening or of an application of management and analysis of geographic data in a GIS environment. The date will be agreed with the students.