

PhD in Civil, Chemical and Environmental Engineering
Curriculum in Fluid Dynamics and Environmental Engineering
2023-2024

(The course is open to several PhD courses and curricula)

1. Title

3D modelling by Photogrammetry and Laser Scanning

2. Course Description

The course provides the basic theory of Photogrammetry and Laser scanning and proposes a practical application for the metric and thematic tridimensional (3D) description of a case study.

The students will acquire the theoretical and practical techniques to perform an integrated photogrammetric and laser scanner survey/monitoring campaign and will be able to process, analyze and represent the 3D output coming from it, with different levels of definition/accuracy depending on the employed devices (digital camera, smartphone, ...).

The main topics will be:

- Basic theoretical elements of Photogrammetry (image and color theory; stereovision; shooting geometry; collinearity equations; bundle-block adjustment; achievable accuracy) and laser scanning (time of flight/triangulation instruments; measured entities; point cloud registration; achievable accuracy);
- Photogrammetric and laser scanner survey planning and execution;
- Data processing and representation (point cloud, meshes, Digital Terrain/Surface Models, and orthophotos).

3. Course Organization

The course consists of lectures (10 hours) and practical activities (survey campaign and data processing, 10 hours).

4. Teachers

Ilaria Ferrando (ilaria.ferrando@edu.unige.it).

5. Duration and credits

20 hours/3 credits.

6. Activation mode and teaching period

Teaching period: September 2024 (the definitive schedule will be arranged with students).

Periodicity: every two years.

7. Deadline for registration

Registration via e-mail (ilaria.ferrando@edu.unige.it) within end of July 2024.

8. Final exam

Oral presentation concerning the performed survey campaign, with critical analysis on the resulting products.