

# PhD program in Civil, Chemical and Environmental Engineering

## Curriculum in Fluid Dynamics and Environmental Engineering

Academic year 2019/2020

### **1. Title of the course**

Satellite and aerial images: automatic processing and analysis

### **2. Contents**

Basic knowledge will be provided about remote sensing image acquisition through passive sensors. In particular:

- elements of radiometry and radiation propagation;
- spectral signature of natural surfaces;
- the atmospheric effect on remotely sensed data;
- optical sensors;
- digital images, formats and resolutions;
- ortophotos and image georeferencing;
- main satellite missions for environmental remote sensing;
- image classification: supervised and unsupervised classifiers; classification validation.
- band composite and spectral indices;
- possible applications to case studies in civil protection (floods, fires), thematic and metric map updating, environmental monitoring and pollution detection;
- data representation in a geographic information system (GIS).

### **3. Structure of the course**

The course consists of lectures (8h) and a computer exercise (4h) in GIS environment.

### **4. Lecturers**

Bianca Federici

### **5. Duration and credits**

12 hours, 2 credits

### **6. Period and registration procedure**

The course will be held in September 2020.

For registration and information send an email to [bianca.federici.et.unige.it](mailto:bianca.federici.et.unige.it)

### **7. Deadline for registration**

Registration within the end of July 2020

### **8. Final exam**

The final examination will be an oral presentation of a theoretical deepening or an experience of automatic processing and analysis of aerial or satellite optical images. The date will be agreed with the students.