Summary
This course covers optical remote sensing from satellites and airborne platforms. The different systems are presented. The students will acquire skills in image processing and machine learning to extract end-products, such as land cover or risk maps, from the images.

Content
Courses content:
1. Basic concepts of remote sensing and digital imaging
2. Platforms and sensors
3. Information extraction, filtering, visual information
4. Image classification, with machine and deep learning algorithms
5. Multitemporal processing and change detection

Project:
• Study a real (geospatial or other) problematic using remote sensing and image processing techniques.

Keywords
Imagery, remote sensing, image processing, signal processing, machine learning, deep learning, satellites

Learning Outcomes
By the end of the course, the student must be able to:
• Describe remote sensing systems
• Describe applications of remote sensing
• Select appropriately the relevant system for a given application
• Perform image classification
• Perform information extraction
• Implement a processing chain to solve a real problem

Transversal skills
• Use a work methodology appropriate to the task.
• Continue to work through difficulties or initial failure to find optimal solutions.
• Access and evaluate appropriate sources of information.
• Collect data.
• Make an oral presentation.
• Write a scientific or technical report.
• Assess progress against the plan, and adapt the plan as appropriate.
• Use both general and domain specific IT resources and tools

Teaching methods
Lessons ex-cathédra (2/3)
Exercise sessions and group project (1/3)

Assessment methods
• Mid-term written test (40% of the final mark)
• Project report (60% of the final mark)

Resources

Bibliography
• R. Caloz, C. Collet, Precis de Télédétection Volume 3: Traitements numériques d'images de télédétection, Presses Universitaires du Québec

http://www.morganclaypool.com/doi/abs/10.2200/S00392ED1V01Y201107IVM012

Ressources en bibliothèque?
• Precis de Télédétection Volume 3 / Caloz
• Remote Sensing Image Processing, Morgan and Claypool / Camps-Valls

Ressources en bibliothèque
• Précis de télédétection. Vol. 3 / Calos
• Remote sensing image processing / Camps-Valls

Websites
• http://www.oneonta.edu/faculty/baumanpr/geosat2/RS-Introduction/RS-Introduction.html
• http://www.crisp.nus.edu.sg/~research/tutorial/process.htm
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