- Faculté des sciences
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Advanced geomatics for biodiversity conservation (3BL2220)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Master en biologie	**Cours: 28 pg**	**Voir ci-dessous**	3

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Printemps

Equipe enseignante

Sébastien Boillat, Magnus Onyiriagwu

Contenu

This course builds on the fundamental concepts of Geographic Information Systems (GIS) acquired in Introduction to Geomatics. We learn more advanced methods of characterizing the earth's surface focusing on remote sensing (RS) datasets and methods. The main objective of the course is to provide practical basic skills on how to access and interpret remotely sensed data for assessing ecological and social-ecological dynamics. Students will become familiar with the general principles of remote sensing and satellite image processing tools with a focus on vegetation and land use. We will work with open-source and user-friendly tools (QGIS and plugins), as well as with Google Earth Engine, a web-based application. The course consists of a mix of lectures, practical exercises and homework. Participants will develop hands-on skills in using basic RS tools including satellite images sourcing and classification, land cover change assessment and their application to ecology and conservation biology at different scales of analysis.

Forme de l'évaluation

Evaluation in form of continuous control, with graded exercises at the end of some practical sessions.

Modalités de rattrapage

In case of failure registration in next session and re-submission of exercices

Documentation

• Lectures notes and tutorials for the practical exercises will be provided as pdf on Moodle
Textbooks (optional complementary literature)
• Heywood I, Cornelius S, Carver S (2011). An introduction to Geographical Information System (4th Edition). Pearson Prentice Hall.
• Cavender-Bares J, Gamon JA, Townsend PA (eds) (2020). Remote Sensing of Plant Biodiversity. Springer Open: Cham Switzerland. Download from https://link.springer.com/content/pdf/10.1007%2F978-3-030-33157-3.pdf
• Chuvieco E, Huete A (2016). Fundamentals of Satellite Remote Sensing CRC Press ISBN 9780415310840 - CAT# TF1686; 448 Pages
Tool descriptions:
• Jung, M. (2016). LecoS — A python plugin for automated landscape ecology analysis. Ecological Informatics, 31: 18-21 https://www.sciencedirect.com/science/article/pii/S1574954115001879
• Congedo, L., (2021). Semi-Automatic Classification Plugin: A Python tool for the download and processing of remote sensing images in QGIS. Journal of Open Source Software, 6(64), 3172, https://doi.org/10.21105/joss.03172

Pré-requis

Introduction to geomatics (3BL2198) or GIS basic skills

Forme de l'enseignement

Computer-based practical labs, lectures and exercices

Objectifs d'apprentissage

Au terme de la formation l'étudiant-e doit être capable de :

- Analyse remotely sensed data to produce land cover dynamics data
- Describe the basic functioning of remote sensing techniques
- Present results as maps, pictures and charts
- Interpret remotely sensed data to assess ecological and social-ecological dynamics
- Identify and evaluate appropriate remotely sensed data

URLs	1) https://moodle.unine.ch/course/view.php?id=10940

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Compétences transférables

- Interpret remotely sensed data
- Explore and review remotely sensed data sources
- Use satellite image processing software

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