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Spatial modelling and remote sensing of natural systems 1 (3BL2198)

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

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

Période d'enseignement:

- Semestre Automne

Equipe enseignante

Dr. Sébastien Boillat

Contenu

This is the first part of the course on spatial modelling and remote sensing of natural systems. The course deals with the fundamental concepts of Geographic Information Systems (GIS) with a practical focus. GIS are powerful tools for the handling of spatial data. They have many applications in the field of biology and ecology including species monitoring, nature conservation, ecosystem management, land planning and the understanding of nature-society interactions in space. In this course, students will learn about geographic information concepts, mapping principles and how to search for, query, create, edit and analyze spatial data. The course consists of a mix of lectures and practical exercises, homework, and field-data collection. Participants will develop hands-on skills in using basic GIS tools and Global Positioning System (GPS), mainly focusing on the open-source software QGIS and its extensions.

Forme de l'évaluation

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

Documentation

• Tutorials for the practical exercises will be provided.
• Madry S (2021). Introduction to QGIS: Open Source Geographic Information System. Locate Press
• Caloz R and Collet C (2011): Analyse spatiale de l'information géographique. Lausanne, Presses Polytechniques et Universitaires Romandes, collection Ingénierie de l'Environnement.
• Heywood I, Cornelius S and Carver S. (2011). An introduction to Geographical Information System (4th Edition). Pearson Prentice Hall/ Education Limited.
• 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, 448 Pages

Pré-requis

None. This course is part 1 (offered in Autumn Semester) and the second course is part 2 (offered in Spring Semester).

Forme de l'enseignement

Lectures and practicals

Objectifs d'apprentissage

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

- Explain the basic representation of biophysical and human variables in a GIS
- Describe the nature of geographic phenomena
- Present results as maps, pictures and charts of some applications
- Use GPS technology and find other spatial data sources, (e.g., species occurrence data from remote sensing)
- Apply a range of spatial query and analysis techniques

Compétences transférables

- Review spatial data sources
- Use geographic information technologies
- Apply spatial reasoning

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