

Land monitoring by advanced satellite remote sensing - Sustainable food production monitoring

1.00 credits

7.5 h + 7.5 h

Q2

Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Prerequisites	LBIRE2102 Géomatique appliquée ou cours d'introduction équivalent à la télédétection LBRAT2104a Land monitoring by advanced satellite remote sensing Compétences en programmation (R, python) Cours connexes: LBRAT2102 Modélisation spatiale des dynamiques territoriales LBRES2101 Technologies intelligentes pour l'ingénierie environnementale LBRAI2221 Agriculture de précision et mécanisation
Main themes	This module is a complement of the main course LBRAT2104a and aims to develop in-depth understanding of the challenges and potential of Earth Observation to support operational agriculture monitoring systems. The strengths, assumptions, and shortcomings of current operational early warning systems and crop monitoring systems are discussed based on a technical analysis of workflows and a quality assessment of input data sources. The European Copernicus Services and the monitoring systems of the European Common Agriculture Policy are analyzed. Further developments are designed to better support the agricultural transformation towards sustainable practices. In the context of the big data era designing end-to-end solutions that are fit for purpose is discussed in order to tackle the challenges of sustainable food production.
Learning outcomes	
Evaluation methods	Evaluation based on a case study (concrete application of your choice) carried out from A to Z throughout the four-month period and presented as a scientific poster.
Teaching methods	The teachnig introduces the concepts and advanced methods while the praticals in computer lab mobilise them in the context of specific applications. The lessons are quite interactive and thre praticals relies on an inductive approach based on a case study of your choice. The course and the praticals aims to develop on one hand advanced technical skills in Earth Observation data processing and on the other hand, the ability of critical analysis with regards existing solutions, services and products. The student learns not only to use open source packages and Google Earth Engine environment but also to assess the quality and to review the validity of the proposed algorithms and datasets for a given application. The practical training is closely linked to the course and includes the use of several open source libraries (including QGIS, SNAP, GDAL, ORFEO, Sen4CAP), the exploitation of the Jupyter notebook environment for quality control et time series analysis, and the workflow coding in Python or R.
Content	The course combines lessons and use case study mainly based on open source software and systems description analysis. The lessons address the following topics among others: • global early warning systems for food security, • rangelands monitoring systems, • national, continental and global crop monitoring systems, • certification support system for regenerative or sustainable agriculture.
Inline resources	Training material on Moodle and open source libraries available in the computer lab.
Other infos	This course is part of the Certificate in Applied Geomatics accessible to professionals as part of continuing training. The theoretical knowledge and practical of this course are mobilized in many other courses in different programs and different faculties. This course can be given in English.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Environmental Bioengineering	BIRE2M	1		
Master [120] in Agricultural Bioengineering	BIRA2M	1		