Course Specifications
Valid as from the academic year 2018-2019

Course size
(nominal values; actual values may depend on programme)
Credits 5.0
Study time 135 h
Contact hrs 60.0 h

Course offerings and teaching methods in academic year 2018-2019
A (semester 1) Dutch
seminar: practical PC room classes 20.0 h
lecture 23.75 h
guided self-study 6.25 h
seminar: coached exercises 10.0 h

Lecturers in academic year 2018-2019
Vancoillie, Frieke
LA20 lecturer-in-charge

Offered in the following programmes in 2018-2019 crdts offering
Bachelor of Science in Bioscience Engineering (main subject Land and Forest Management) 5 A

Teaching languages
Dutch

Keywords
Earth observation, platforms, sensors, aerial photography, satellite imagery, visual image interpretation, digital image processing and information extraction

Position of the course
In an introductory part, the physical principles (e.g. radiation) are explained that relate to the mechanisms of image acquisition in remote sensing. A chapter on imaging with photography is followed by a treatise on quantitative measurements on aerial photographs, and a discussion on the basics of image interpretation. Further, scanning hardware is discussed, as well as characteristics of scanner images and their applications (multispectral, thermal, hyperspectral).

The chapter on satellite platforms pertains to a selection of current spaceborne satellite systems.

A comprehensive chapter on digital image processing tackles issues such as image preprocessing, algorithms for image segmentation and classification and applications such as biophysical modelling and mapping. A final chapter is about RADAR and LiDAR remote sensing (sensors, image features, processing).

A comprehensive set of practical exercises enables the student to master visual image analysis (using a mirror stereoscope) as well as digital image processing on PC. Hereby, imagery and techniques originating from research conducted at the department are incorporated.

In modern land, forest and nature management spatial information techniques are indispensable for planning, inventory and monitoring activities. Remote sensing is able to deliver actual and historical analogue and digital raster data from which qualitative (e.g. mapping) as well as quantitative (e.g. measurements) information can be derived. Acquiring insight and knowledge of methods and techniques of earth observation has the ultimate goal to contribute to sound land, forest and nature management.

Contents
- Basic principles of remote sensing: energy sources and radiation principles, energy interactions with the atmosphere and the Earth's surface
  Visual image interpretation: principles, strategies and applications
- Photographic systems: film types, film development, filters and camera's; geometry of
access to this course unit via a credit contract is determined after successful competences assessment.
This course unit cannot be taken via an exam contract.

end-of-term evaluation
examination during the second examination period is possible.

Writing a high-quality scientific report about remote sensing image analysis.

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment.

Conditions for exam contract
This course unit cannot be taken via an exam contract.

Teaching methods
Guided self-study, lecture, seminar: coached exercises, seminar: practical PC room classes

Learning materials and price
- Slides used in the lectures are available from the Minerva learning platform
- Instruction notes for the exercises
Cost: 70 EUR

References
Minerva learning platform
Course content-related study coaching
Via Minerva site, or on an ad hoc basis after lectures or during practicals

Evaluation methods
end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
Written examination with open questions, oral examination, skills test

Examination methods in case of periodic evaluation during the second examination period
Written examination with open questions, oral examination, skills test

Examination methods in case of permanent evaluation
Possibilities of retake in case of permanent evaluation
examination during the second examination period is possible

Calculation of the examination mark
Theory: 12/20
Skill test: 8/20
Abstaining from period aligned evaluations gives rise to a total score (theory + practical exercises) of maximum 9/20, irrespective of the points for the different sections.