Course Specifications
Valid in the academic year 2018-2019

Land Information Systems (1000064)

Course

Lecturers in academic year 2018-2019

Vancoillie, Frieke
LA20 lecturer-in-charge

Sleutel, Steven
LA20 co-lecturer

Verhoest, Niko
LA20 co-lecturer

Offered in the following programmes in 2018-2019

Bachelor of Science in Bioscience Engineering (main subject Land and Forest Management)
5 credits offering A

Master of Science in Bioscience Engineering: Environmental Technology
5 credits offering A

Teaching languages

Dutch

Keywords

Geographic information systems, digital data bases, spatial data analysis

Position of the course

This course consists of two parts: a basic module and an in-depth module with integrated applications for land management. The basic module is programmed during the first seven weeks of the semester. The integrated application module then takes five weeks.

GIS: basics (Lecturer: Frieke Vancoillie)

In this module the basic principles of digital geocoded information systems are treated. The full cycle of acquisition, management, processing, visualisation, integration and communication of geographic data is handled. The main functions applied for land management are reviewed. During the exercises, the students can acquire basic skills pertaining to GIS data analysis. The exercises are performed with free and open source software (FOSS), partly available on classroom PCs, partly installed on laptops brought on by the students themselves. The basic module ends with an introduction ArcGIS. During the basic module, a company visit to the Agency of Information Flanders is organized.

GIS: integrated applications (Lecturer: Frieke Vancoillie, NV?, SS?)

This module builds on the basic module. Using advanced GIS techniques, students search for solutions for real-world environmental problems by integrating the various environmental components of soil, water, forest and nature. Where possible, guest speakers are invited to explain the role of GIS analysis for operational applications.

Contents

GIS: basics

The following aspects are addressed systematically: GIS concepts, geospatial data structures, data input, data display, data query, data analysis and data output. The exercises are tasks that are independently performed with QGIS. As the course progresses, the complexity of the exercises increases. The treated geospatial problems are taken from real life: e.g. missing maps, volumetric assessment of the Antarctic

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icecap, emergency planning in case of nuclear plant failure, suitability analysis for the installation of solar panels.

**GIS: integrated applications**

The students are given one or more environmental problems, which are not only more complex than in the basic module, but also require an integrated approach. In groups, they first critically analyse the problem and then design and implement a solution methodology. The solution protocol including the results are reported extensively. In conclusion, the students present their teamwork (presentation) meanwhile thoroughly debating the spatial analysis techniques.

### Initial competences
- Basic knowledge of informatics

### Final competences

1. Identify the function of the different components of a GIS
2. Identify the properties of a geographic data model (including scale, projection, coordinate system, etc.) and use these properly
3. Distinguish the characteristics of raster and vector data and integrate these into applications
4. Identify the basic principles of relational databases and link them with a GIS
5. Retrieval of relevant spatial data for a particular task
6. Critically analyse a spatial problem and solve it independently
7. Design of cartographic information based on a GIS and spatial data
8. Select and use available hardware, software and expertise purposefully
9. Creatively exploit knowledge related to GIS concepts and techniques in spatial analysis and modeling assignments
10. Writing a high-quality scientific report with respect to a spatial analysis
11. Apply these insights and skills for environmental applications related to vegetation, soil and water management

### 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, group work, lecture, seminar

### Extra information on the teaching methods

- The theoretical lessons are lectures. The practical exercises are mainly supervised practicals and seminars in a PC-class.

### Learning materials and price

1) Course books (facultative):
2) Slides + documents downloadable from Minerva

### References

Through Minerva

### Course content-related study coaching

Ad hoc after the lessons or during practicals; through Minerva

### Evaluation methods

- end-of-term evaluation and continuous assessment

### Examination methods in case of periodic evaluation during the first examination period

- Oral examination, skills test

### Examination methods in case of periodic evaluation during the second examination period

### Examination methods in case of permanent evaluation

- Participation, assignment, report

### Possibilities of retake in case of permanent evaluation

- examination during the second examination period is possible

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Extra information on the examination methods

The skill test is a practical exam that assesses the extent to which students can adequately perform the desired GIS skills.

Calculation of the examination mark

Oral exam: 25%
Skill test: 30%
Reports (incl. participatie): 10%
Team work (incl. participatie): 35%

Abstaining from period aligned and/or non-period aligned evaluations gives rise to a total score of maximum 9/20, irrespective of the points for the different sections.