

## Introduction to Geographical Information Systems and Surveying Engineering (C001668)

Course size (nominal values; actual values may depend on programme)  
Credits 5.0 Study time 150 h Contact hrs 62.5 h

### Course offerings and teaching methods in academic year 2018-2019

Offering	Language	Teaching Method	Hours
A (semester 2)	Dutch	seminar: practical PC room classes	20.0 h
		seminar: coached exercises	20.0 h
		lecture	22.5 h

### Lecturers in academic year 2018-2019

De Wulf, Alain	WE12	lecturer-in-charge
De Maeyer, Philippe	WE12	co-lecturer
Van de Weghe, Nico	WE12	co-lecturer

Offered in the following programmes in 2018-2019	crdts	offering
<a href="#">Bachelor of Science in Geology</a>	5	A

### Teaching languages

Dutch

### Keywords

Topography, Surveying Engineering, Topometry, Micro-GIS, Geodesy, Geomatics, Geographic Information Systems, Geographic Information Science, Georeferencing, Geocoding, Spatial modelling

### Position of the course

To introduce the basics of spatial localisation, surveying and geographic information systems. To analyse the accuracy of different instruments and methods, as foreseen by the aims of the geologic study program.

### Contents

Basic terminology of surveying. Surveying instruments (levels, totalstations, GPS). Different methods of leveling, length and angle measurements. Exercises using these instruments and performing leveling, polygonal, GPS, projects. Basic elements of geodesy, map projections and map coordinate systems (Lambert 72 and UTM). Definitions, development of GIS, GIS components, geocoding of geographic information, georeferencing, datastructures, map layers and overlays, map algebra, spatial modelling, user modalities and applications + exercises.

### Initial competences

Entry level for the University

### Final competences

- 1 To formulate elementary geological positioning problems in GIS-terms.
- 2 Becoming capable of using GIS-techniques in geological applications.
- 3 Insights: to know what types of surveying instruments are available, to understand their advantages and disadvantage, to know which measurement methods are available.
- 4 Skills: handling different types of surveying methods and surveying equipment in order to perform accurate surveying measurements.
- 5 Attitudes: performing and interpreting measurements, learning to discern and evaluate all parameters that can influence the accuracy of a measurement.

#### 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

Lecture, seminar: coached exercises, seminar: practical PC room classes

#### Extra information on the teaching methods

Part Surveying Engineering: Theory: lectures

Exercises in the field.

Part Geodesy and GIS: Theory: oral lectures and demonstrations. Exercises in the PC-class.

#### Learning materials and price

De Maeyer, De Wulf, Neutens, Ooms (2014). Geomatica voor Geologen. Een inleiding tot topografie, GIS en cartografie Academia Press, Isbn nr: 978 90 382 2317 9. Richtprijs ca. 40€.

#### References

A list of standard surveying engineering books in Dutch, French, German and English is included in the syllabus and the books are available in the library of the Department of Geography.

Hendrikx & Ottens (red.), 1997. Geografische Informatie-Systemen in ruimtelijke Analyse, Van Gorcum.

P. Burrough & R.McDonnell, 1998. Principles of Geographical Information systems. Oxford University Press.

#### Course content-related study coaching

Interactive support through Minerva. The students can contact the teaching staff (professors, assistants) or the study coaches yearly appointed by the Department of Geography.

#### Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination

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

Written examination

#### Examination methods in case of permanent evaluation

Report

#### Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

#### Extra information on the examination methods

Theory: written examination.

Exercises Surveying: Written report for surveying exercises.

Exercises GIS: Digital files of GIS exercises will be evaluated.

Surveying/GIS/carto 40/40/20.

#### Calculation of the examination mark

Theory (2/3) and exercises (1/3).