

Course Specifications

From the academic year 2017-2018 up to and including the

3D Acquisition and Visualisation (C001660)

Course size (nominal values; actual values may depend on programme)

Credits	5.0	Study time	150 h	Contact hrs	55.0 h
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Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	Dutch	fieldwork	20.0 h
		project	20.0 h
		lecture	15.0 h

Lecturers in academic year 2018-2019

De Wulf, Alain	WE12	lecturer-in-charge
Goossens, Rudi	WE12	co-lecturer

Offered in the following programmes in 2018-2019

Master of Science in Geomatics and Surveying	crdts	offering
	5	A

Teaching languages

Dutch

Keywords

3D acquisition and visualisation, laserscanning, terrestrial photogrammetry, photomodelling, CAD.

Position of the course

A basic knowledge of all disciplines of geomatics is assumed. This course consists of theory of laserscanning, combined with an integrated project dealing with the following four topics:

- Engineering surveying using totalstation and GNSS
- Laserscanning (including theory)
- Terrestrial photogrammetry
- Photomodelling
- CAD

The aim of the project is, starting with field measurements (GNSS, totalstation, laserscanning and photographs), to make a 3D CAD model of a historic monument or building.

Contents

- Theory of laserscanning;
- Project work comparing photogrammetric acquisition and restitution with laserscanning and classical surveying with GNSS and totalstation;
- 3D modelling;
- Visualisation using CAD.

Initial competences

Basic knowledge of geomatics (geodesy, GIS, informatics, surveying, photogrammetry, remote sensing, satellite positioning, CAD,...) (as is acquired by Bachelors in Geomatics).

Final competences

Students satisfy the requirements of the education profile for surveyors, based on the approved profession profile for surveyors. Therefore, the student needs to possess:

- 1 The knowledge to judge the equipment most adapted for a surveying project;
- 2 The ability to apply the theoretical knowledge in the fields of Surveying, CAD, Photogrammetry and Laserscanning.
- 3 The knowledge to evaluate different approaches on the site;.

- 4 The capacity of explaining the differences between different solving methodologies.
- 5 The capability to predict the accuracy that can be expected with specific equipment and a specific measuring methodology.
- 6 To discern all factors that influence the reliability and accuracy of a solution and of the statistical analytical data processing involved.
- 7 The capacity to manage, execute and self-evaluate an integrated project.

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, project, fieldwork

Extra information on the teaching methods

Ex cathedra for the laserscanning theory.

Projectwork: On site training. A training report has to be made and will be evaluated.

Learning materials and price

Laserscanning Book: free downloadable using Minerva (see "references").

Project description and slides: free downloadable using Minerva.

Surveying instruments, laserscanner, photogrammetric camera, PC's, restitution and CAD software are available, free of cost, for the project work.

References

Jerma Garcia, J.L., Van Genechten, B., Heine, E., Santana Quintero, M. (Eds.) (2008) 3D RiskMapping - Theory and practice on Terrestrial Laser Scanning. Training material based on practical applications. Valencia, Spain: Universidad Politecnica de Valencia, ISBN.:978-84-8363-312-0

Course content-related study coaching

Students can appeal to the lecturer and exercise assistants, and to the study guides foreseen by the geography department every year and to the electronic platform Minerva.

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination, oral examination

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

Written examination, oral examination

Examination methods in case of permanent evaluation

Assignment

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible

Extra information on the examination methods

Oral and written evaluation of the laserscanning theory and of the project work.

Calculation of the examination mark

Laserscanning theory: periodical (1/3 of the total points).

Project report: periodical (2/3 of the total points).