UNIVERSITEIT GENT

Studiefiche

Vanaf academiejaar 2020-2021

Land Information Systems (I002774)

Wegens Covid19 kan mogelijk afgeweken worden van de onderwijs- en evaluatievormen. Dergelijke afwijkingen zullen via Ufora worden gecommuniceerd.

Cursusomvang *(nominale waarden; effectieve waarden kunnen verschillen per opleiding)*

Studiepunten 5.0 **Studietijd** 150 u **Contacturen** 50.0 u

Aanbodsessies en werkvormen in academiejaar 2020-2021

A (semester 1)	Engels	Gent	hoorcollege	12.5 u
			werkcollege: PC-klasoefeningen	22.5 u
			groepswerk	12.5 u
			demonstratie	2.5 u

Lesgevers in academiejaar 2020-2021

Verdoodt, Ann	LA20	Verantwoordelijk lesgever
Dondeyne, Stefaan	WE12	Medewerker
Sleutel, Steven	LA20	Medelesgever

Aangeboden in onderstaande opleidingen in 2020-2021	**stptn**	**aanbodsessie**
Master of Science in Physical Land Resources (afstudeerrichting Land Resources Engineering)	5	A
International Master of Science in Soils and Global Change (afstudeerrichting Physical Land Resources and Global Change)	5	A
International Master of Science in Soils and Global Change (afstudeerrichting Soil Biogeochemistry and Global Change)	5	A
Master of Science in Physical Land Resources (afstudeerrichting Soil Science)	5	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: land- en bosbeheer (niveau master-na-bachelor)	5	A

Onderwijstalen

Engels

Trefwoorden

Georeferenced information, natural resources, GIS, thematic maps, spatial analysis, cartographic modeling; QGIS

Situering

A land information system consists of a database containing spatially referenced land-related data for a defined area and of procedures and techniques for their collection, updating, processing and distribution. This course aims to build insight in the science behind Geographic Information Systems (GIS) with a focus on natural land resources, complemented with a hands-on PC training in the use of GIS software to perform an advanced integrated spatial analysis that supports land use related decision-making.

Inhoud

Theory

1 GIS definition and general functionalities
2 Basic map concepts: vector and raster data structures, topology, sources of geographical information (maps, remote sensing, GPS)
3 Map scale, projections and coordinate systems
4 GPS
5 Hardware and software, DBMS
6 Basic GIS functions (editing, transformations, map join,..)

7 Basic spatial analysis
8 Advanced spatial analysis and cartographic modeling (reclassification, overlay, buffer, network connectivity, contiguity, proximity, spreading, digital terrain model analysis)
9 Interpolation methods (trend surfaces, Thiessen polygons, Inverse distance weighting)

Practical exercises

1 On-screen digitalisation, editing of vector layers and adding attribute information
2 Correct visualization of spatial information (coordinate reference systems, color maps)
3 GIS analysis and basic cartographic modeling
4 GIS analysis and advanced cartographic modeling
5 Applying interpolation techniques

Begincompetenties

The student understands the meaning and use of statistical descriptives, regression analyses, and statistical tests (t-test, ANOVA)

Eindcompetenties

1 Understand and correctly use specific terminology and principles related to GIS in general and land information systems more specifically when communicating with experts
2 Being capable to equip a GIS laboratory with the necessary hardware and software, being at the same time aware of the importance of required human expertise
3 Understand and recognize the importance of map projections in GIS and LIS, and being capable to define and/or change map projection and coordinate systems
4 Being aware of the applicability of LIS in various other scientific disciplines and in interdisciplinary assessments involving natural land resources
5 Importing, exporting and editing digital information from various sources
6 Performing basic as well as advanced spatial analyses on digital maps representing vector and raster data structures
7 Performing advanced analyses on digital elevation models
8 Interpolate point maps to raster maps
9 Perform an integrated spatial analysis on the basis of digital information (cartographic modelling)

Creditcontractvoorwaarde

Toelating tot dit opleidingsonderdeel via creditcontract is mogelijk mits gunstige beoordeling van de competenties

Examencontractvoorwaarde

Dit opleidingsonderdeel kan niet via examencontract gevolgd worden

Didactische werkvormen

Demonstratie, groepswerk, hoorcollege, werkcollege: PC-klasoefeningen

Toelichtingen bij de didactische werkvormen

The theoretical lessons are lectures with some demonstrations.
Practical exercises consist of supervised practicum and demonstration in a PC-class using QGIS, as well as a coached integrative group work.
The students can prepare themselves to each practical exercise through a series of weblectures, handling specific actions and commands in the software package QGIS.
The student can also monitor his/her progress in skills and understanding throughout the practical sessions using curios tasks.

Leermateriaal

An English syllabus (course + practical exercises) will be made available during the first lectures, downloadable from Minerva (about 180 pages, estimated printing cost: €12).
During the course of the lectures, an electronic version of the slides will be deposited at the Minerva site. Weblectures will be provided that illustrate specific actions and commands in QGIS. QGIS software is available for download and is installed on the computers in the PC rooms of the faculty.

Referenties

- Longley, P.A., Goodchild, M.F., Maguire, D.J., Rhind, D.W. 2015. Geographic

Information Science and Systems. 4th Edition. Wiley
- Burrough, P., McDonnell, R.A., Lloyd, C.D. 2015. Principles of Geographic Information Systems. 3rd Edition. Oxford University Press
- Heywood, I., Cornelius S., Carver, S. 2012. An Introduction to Geographic Information Systems. Pearson Education Limited, Prentice-Hall
- DeMers M.N. 2017. Geographic Information Systems in Action. 1st Edition. Wiley.

Vakinhoudelijke studiebegeleiding

GIS-library for additional information is available. The software package is freely downloadable on personal computer and has been installed as well in different PC classes for easy access during self-study. Consultancy by professor and assistant if needed.

Evaluatiemomenten

periodegebonden en niet-periodegebonden evaluatie

Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode

Schriftelijk examen met open vragen

Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode

Schriftelijk examen met open vragen

Evaluatievormen bij niet-periodegebonden evaluatie

Schriftelijk examen met open vragen, participatie, werkstuk, vaardigheidstest

Tweede examenkans in geval van niet-periodegebonden evaluatie

Examen in de tweede examenperiode is enkel mogelijk in gewijzigde vorm

Toelichtingen bij de evaluatievormen

The period-aligned evaluation consists of a written examination with open questions on the theory.

The non-period aligned practical examination consists of an integrated exercise, combining different tools seen in the practical exercises, that (1) needs to be completed on the PC (skills test) and (2) of which the main results are reported in the form of a written exam. This exam takes place during the last scheduled practical exercise at the end of the semester.

Eindscoreberekening

The overall mark for the course is calculated based on three parts: a theoretical exam (35%, written examination), a practical exam (35%, skills test and written exam) and the group work (25% on the submitted maps and report, 5% on participation).

If the student doesn't pass for the course in the first session, but succesfully passed one of the three exam components, he/she can pass on these marks to the 2nd session and only need(s) to repeat the component on which he/she failed.