

Course Specifications

Valid as from the academic year 2020-2021

Geo-Programming (C003867)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size (nominal values; actual values may depend on programme)
Credits 5.0 Study time 150 h Contact hrs 50.0 h

Course offerings and teaching methods in academic year 2020-2021

A (semester 2)	Dutch, English	Gent	lecture	15.0 h
			seminar: practical PC room classes	35.0 h

Lecturers in academic year 2020-2021

Huang, Haosheng WE12 lecturer-in-charge

Offered in the following programmes in 2020-2021

	crdts	offering
Bachelor of Science in Geography and Geomatics	5	A
Linking Course Master of Science in Geography and Geomatics	5	A
Preparatory Course Master of Science in Geography and Geomatics	5	A

Teaching languages

Dutch, English

Keywords

Geomatics, programming, scripting, libraries.

Position of the course

The practical Python programming experience is elaborated within the context of geography, GIS and geomatics. Special attention is given to the use of geographical data and spatio-temporal data analysis (via geo-libraries) for addressing geographical problems and issues. Algorithms and data structures, needed to use geographical information adequately, are also demonstrated and explained.

Contents

- Introduction to geographical data (e.g. shapefiles) and geographical databases.
- Introduction to (geo-)algorithms and complexity
- Python scripting for GIS applications: processing, analyzing and visualizing geodata (e.g. in GIS software such as ArcGIS or QGIS)
- Python scripting for remote sensing and point clouds
- Python for geo-statistics
- Brief introduction to geo-AI

Initial competences

Experience in Python programming and Geographical Information Systems

Final competences

- 1 The student should be able to solve a simple exercise with a geomatics background, phrased in natural language, to a proper and correct algorithm and/or program in Python.
- 2 The student should have acquired adequate practical and theoretical knowledge of the basic principles of commonly used data types and algorithms.
- 3 The student should be able to manage and process geographical data with the help of Python scripting and geo-libraries.

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

Group work, lecture, seminar: practical PC room classes, online lecture

Learning materials and price

Syllabus, slides, and other course materials are available on Ufora.

References

Tateosian L., "Python for ArcGIS", Springer, 2015.
Zandbergen P., "Python Scripting for ArcGIS Pro", ESRI Press, 2020
Zandbergen P., "Advanced Python Scripting for ArcGIS Pro", ESRI Press, 2020
Xiao N., "GIS Algorithms", Sage Publications Ltd, 2015
Chun Y., Griffith D., "Spatial Statistics and Geostatistics", Sage Publications Ltd, 2013

Course content-related study coaching

Interactive support via Ufora. Students can appeal to the lecturer and exercise assistants, and to the study coaches which are provided by the geography department.

Evaluation methods

end-of-term evaluation and continuous assessment

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

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

Examination methods in case of permanent evaluation

Oral examination, assignment, report

Possibilities of retake in case of permanent evaluation

not applicable

Extra information on the examination methods

- Assessment of the written assignments.
- Assessment of the written project report, supplemented by an oral presentation, in which both the report itself and the work performed can be evaluated.

Calculation of the examination mark

- Assignments (40%)
- Assessment of the written project report + oral presentation (60%)