

Hydrological Modelling (I002659)

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 4.0 **Study time** 120 h **Contact hrs** 40.0 h

Course offerings and teaching methods in academic year 2020-2021

| | | | | |
|----------------|-------|------|------------------------------------|--------|
| A (semester 1) | Dutch | Gent | lecture | 15.0 h |
| | | | seminar: practical PC room classes | 25.0 h |

Lecturers in academic year 2020-2021

Verhoest, Niko LA20 lecturer-in-charge

Offered in the following programmes in 2020-2021

| | crdts | offering |
|---|-------|----------|
| Master of Science in Bioscience Engineering: Land and Water Management | 4 | A |
| Exchange Programme in Bioscience Engineering: Land and Forest management (master's level) | 4 | A |

Teaching languages

Dutch

Keywords

Hydrological models, calibration, uncertainty, model updating

Position of the course

An overview of the modelling of the different hydrological processes and of the most important types of hydrological models is given. Attention is also given to the problem of calibrating and uncertainty. Finally, the updating of models through data assimilation is discussed.

Contents

1. Basic concepts of hydrological models
2. Overview of hydrological models
3. Hydrological data
4. Model calibration
5. Sensitivity analysis
6. Uncertainty analysis
7. Data assimilation

Initial competences

Hydrological modelling builds upon certain final competences of the courses 'Hydrological Processes and Hydrometry', 'Modelling and simulation of biosystems', 'Scientific computing' (knowledge of Matlab) and 'Probabilistic models'; or the learning outcomes have been achieved differently.

Final competences

- 1 To explain different alternatives for the modelling of hydrological processes
- 2 To explain the basic principles of hydrological modelling
- 3 To build a simple hydrological model.
- 4 To explain and implement an uncertainty analysis in hydrological modelling.
- 5 To explain and implement different alternative methods for data assimilation.
- 6 To critically read scientific literature on hydrological modelling

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: practical PC room classes

Extra information on the teaching methods

The theory is taught during lectures. During these lectures, scientific paper are critically read. Exercises exist of programming of algorithms that demonstrate the theory and of discussing the results of the simulations performed with them, and to write a scientific report.

Learning materials and price

A syllabus is available. Estimated cost: 12 EUR

References

Beven K., Rainfall-Runoff Modelling - The primer, Wiley-Blackwell, 2nd edition, 2012

Course content-related study coaching

Possibility to ask questions during and after lectures and availability of the lecturer for questions and additional information with regard to theory and practice

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination with open questions, oral examination

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

Written examination with open questions, oral examination

Examination methods in case of permanent evaluation

Assignment, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

Extra information on the examination methods

Closed book exam (written and oral) for the theory. Oral exam on the software developed during the practicals and the obtained results with them.

Calculation of the examination mark

Theory (period aligned evaluation): 40%

Exercises (period aligned evaluation): 25%

Exercises (non-period aligned evaluation): 35%

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.