

## Hydrological Processes and Hydrometry (1002449)

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** 3.0      **Study time** 90 h      **Contact hrs** 30.0 h

### Course offerings and teaching methods in academic year 2020-2021

A (semester 1)	Dutch	Gent	seminar: practical PC room classes	10.0 h
			excursion	5.0 h
			practicum	2.5 h
			lecture	12.5 h

### Lecturers in academic year 2020-2021

Verhoest, Niko      LA20      lecturer-in-charge

### Offered in the following programmes in 2020-2021

<a href="#">Bachelor of Science in Bioscience Engineering (main subject Land and Water Management)</a>	<b>crdts</b>	<b>offering</b>
	3	A

### Teaching languages

Dutch

### Keywords

Precipitation, evapotranspiration, infiltration, groundwater flow, discharge, hydrometry

### Position of the course

This course describes the hydrological cycle and examines the most important hydrological processes. Emphasis is given to the physical description of the phenomena, the interactions between hydrological processes and to the techniques that are used to measure different hydrological variables. Further, attention is paid to extreme hydrological events.

### Contents

#### *Theory*

1. Precipitation (measurement; point versus areal precipitation; analysis of precipitation time series; rainfall under vegetation)
2. Evapotranspiration (energy balance method; aerodynamic method; estimation of the evapotranspiration of crops based on crop coefficients; measurement devices)
3. Water in the soil (groundwater; soil moisture; introduction to the flow in the (un) saturated zone; infiltration, measurement devices for groundwater depths, soil moisture and infiltration)
4. Discharge (surface runoff, interflow, baseflow, river discharge, routing, discharge measurement)
5. Extreme hydrological events (return period, floods, droughts)

#### *Exercises*

The exercises consist of a combination of conduction measurements of hydrological variables using a data logger, computer-based exercises that demonstrate the theory and make use of online hydrological databases and an excursion to different water management infrastructures.

### Initial competences

This course builds on learning outcomes of the course units 'Earth Sciences',

'Environmental Sciences', 'Fluid Mechanics' and 'Electricity, Magnetism and Sensors' or the learning outcomes have been achieved differently.

### **Final competences**

- 1 To explain the physical background of different hydrological processes.
- 2 To understand the interactions between hydrological processes
- 3 To model some hydrological processes.
- 4 To explain different types of measurement devices for the main hydrological variables
- 5 To perform measurements of different hydrological variables.
- 6 To process hydrological data.
- 7 To calculate the return period of extreme hydrological variables

### **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**

Excursion, lecture, practicum, seminar: practical PC room classes

### **Learning materials and price**

Course notes are available (about 10 euro). All powerpoint presentations are made available to the students via Ufora, prior to the lectures.

### **References**

Chow, V.T., D.R. Maidment, L.W. Mays, Applied hydrology, Mc Graw-Hill International editions, 1988.

### **Course content-related study coaching**

Individual coaching is possible

### **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**

Oral examination, report

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

examination during the second examination period is possible in modified form

### **Calculation of the examination mark**

Theory: 50%, Exercises: 50%

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