

## Faculty of Biological, Agronomic and Environmental Engineering

### BIRE2103 General hydrology

[30h+30h exercises] 5 credits

This course is taught in the 1st semester

**Teacher(s):** Charles Bielders, Marnik Vanclooster  
**Language:** French  
**Level:** Second cycle

#### Aims

At the end of the theoretical course (2.5 ECTS) and the practical exercises (2.5 ECTS), the students must be able :

- to understand the issue of water management at the scale of the local scale (the field parcel) and the scale of the catchment ;
- to describe the different processes and the different terms of the hydrological cycle at the scale of a pedon, the field parcel and the catchment, and to understand the equations used for describing these processes ;
- to describe the functioning, the advantages and disadvantages of hydrological measurement devices ;
- to interpret basic hydrological measurements (rainfall, evapotranspiration, drainage and run-off);
- to calculate, by means of simple hydrological models, the rainfall runoff relationship at the field and catchment scale;
- to justify the choice of a hydraulic device to control the surface water flow at the field and catchment scale; and
- to write a synthetic report on the practical work and to analyse critically the obtained results.

#### Main themes

- Issues of water management at the local and catchment scale
- Hydrological cycle (rainfall, infiltration, run-off, drainage, hypodermic flow, evapotranspiration) : processes, mathematical description, measurement methods and interpretation.
- Hydrological modelling at the field and catchment scale
- Hydraulic control of surface water flow

#### Content and teaching methods

Theoretical courses

- Introduction. Issues of hydrology at different scales
- Rain- Infiltration
- Evapotranspiration
- Run-off
- Hydrological modelling
- Hydrological control

Practical work

The theoretical aspects are illustrated by means of practical work in the laboratory and computer class room around 2 hydrological projects : the design of a storm bassin in a catchment and the calculation of the hydrological balance of a field parcel. An excursion allows to illustrate concepts of hydrometry and hydrological control.

**Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)**

Supplemental courses Soil physics, integrated water resources management, open channel hydraulics

Evaluation Report on the practical works and the excursion. Oral examination

Support - Transparencies of the theoretical course ([www.icampus.ucl.ac.be](http://www.icampus.ucl.ac.be))

- Syllabus ([www.icampus.ucl.ac.be](http://www.icampus.ucl.ac.be))

**Other credits in programs**

<b>BIR22/0E</b>	Deuxième année du programme conduisant au grade de bio-ingénieur: Sciences et technologies de l'environnement (Technologies et gestion de l'information)	(5 credits)	Mandatory
<b>BIR22/4E</b>	Deuxième année du programme conduisant au grade de bio-ingénieur : Sciences et technologie de l'environnement (Technologies environnementales: eau, sol, air)	(5 credits)	Mandatory
<b>BIR22/5E</b>	Deuxième année du programme conduisant au grade de bio-ingénieur : Sciences et technologie de l'environnement (Aménagement du territoire)	(5 credits)	Mandatory
<b>BIR22/6E</b>	Deuxième année du programme conduisant au grade de bio-ingénieur : Sciences et technologie de l'environnement (Nature, eau & forets)	(5 credits)	Mandatory
<b>BIR22/7A</b>	Deuxième année du programme conduisant au grade de bio-ingénieur : Sciences agronomiques (Ressources en eau et en sol)	(5 credits)	
<b>BIR22/7E</b>	Deuxième année du programme conduisant au grade de bio-ingénieur : Sciences et technologie de l'environnement (Ressources en eau et en sol)	(5 credits)	Mandatory
<b>GEOG22</b>	Deuxième licence en sciences géographiques	(5 credits)	