BRES2104 Hydraulics on open channels

[22.5h+15h exercises] 3 credits

This course is taught in the 2nd semester

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

Aims

At the end of the course, the student must be able :
- to characterize different flow regimes in open channels ;
- to apply the principle of energy conservation and momentum on flow in open channels ;
- to characterize a velocity profile in an open channel
- to understand the functioning of discharge measurements
- to understand theory of uniform flow, gradually varying flow and rapid varying flow

Main themes

- Theory of open channel hydraulics
- Classification of flow : uniform and non-uniform flow ; steady state and gradually varied flow
- Properties of open channels : energy and momentum principles
- Velocity profiles. Specific energy, specific force
- Hydrometrology : Venturi, Parshall, gauging,
- Uniform flow theory
- Gradually varied flow theory. Classification of hydraulic axes. Integration methods
- Rapidly varied flow : hydraulic jump, fall, weirs

Content and teaching methods

Theoretical course
- Classification of flow : uniform and non-uniform flow ; steady state and gradually varied flow
- Properties of open channels : energy and momentum principles
- Velocity profiles. Specific energy, specific force
- Hydrometrology : Venturi, Parshall, gauging,
- Uniform flow theory
- Gradually varied flow theory. Classification of hydraulic axes. Integration methods
- Rapidly varied flow : hydraulic jump, fall, weirs
- Demonstration of specific software

Practical work
- Demonstration and use of hydrometrological instruments
- Demonstration of different flow regimes in a hydraulic channel in the laboratory
- Establishment of the specific energy curve
- River gauging

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

PrecursoryCourses Transport phenomena
Evaluation - Report on the practical work - Calculation of a hydraulic axe
Support - Syllabus - Transparents of the course (www.icampys.ucl.ac.be)

Programmes in which this activity is taught

BIR2	Bio-ingénieur

Other credits in programs

BIR22/7A	Deuxième année du programme conduisant au grade de bio-ingénieur : Sciences agronomiques (Ressources en eau et en sol)	(3 credits)
BIR22/7E	Deuxième année du programme conduisant au grade de bio-ingénieur : Sciences et technologie de l'environnement (Ressources en eau et en sol)	(3 credits)