

Water Resources Engineering (I002707)

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	<i>(nominal values; actual values may depend on programme)</i>			
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	Gent	seminar: practical PC room classes	25.0 h
			lecture	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			5	A

Teaching languages

Dutch

Keywords

Quantitative Water management, engineering, river management

Position of the course

In this course, water engineering techniques are being taught. First some statistical analysis tools are discussed, which mainly focus on describing extreme events. Then, principles of hydrologic design are introduced. The use of physical scale models for designing constructions are discussed. Techniques for generating design rainfall and design flow are taught. Then some basic theory of sediment transport in rivers is given in order to be able to design or protect rivers and canals for erosion or sedimentation. The storage of water for as well water use as for flood control purposes is discussed as well. Finally, the design of some small hydraulic structures (e.g. culverts, weirs and stilling basins) is studied.

Contents

1. Hydrologic statistics and frequency analysis
2. Principles of hydrologic design
3. Dimensional analysis and physical scale models
4. Design rainfall
5. Design flows
6. River and channel engineering
7. Flood control
8. Small hydraulic structures
9. Design for water use

Initial competences

Water resources engineering builds upon certain final competences of the courses 'Hydrologic processes and hydrometry', 'Hydrological modelling', 'Groundwater flow', 'Open channel hydraulics' and 'Scientific computing' (knowledge of Matlab); or the final competences were obtained in another manner.

Final competences

- 1 To master the concepts of hydrologic design.
- 2 To master the principles of design of small hydraulic structures in rivers.
- 3 To understand flood risk assessment and flood risk management

4 To understand the principles behind management measures against erosion and sedimentation in rivers.

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. Exercises exist of solving problems that demonstrate the theory.

Learning materials and price

A syllabus is available. Estimated cost: 15 EUR.

References

Chow et al., Applied hydrology, McGraw-Hill international Editions, ISBN 0-07-100174-3
Mays, Water Resources Engineering, 2nd edition, Wiley, ISBN 978-0-470-46064-1
Chin, Water-Resources Engineering, Prentice Hall, ISBN 0-201-35091-2
Julien, River Mechanics, Cambridge University Press, ISBN 0-221-56284-8
Chadwick et al., Hydraulics in civil and environmental engineering, 4th edition, Spon Press Taylor & Francis Group, ISBN 0-415-30609-4
Novak et al., Hydraulic structures, 3rd edition, Spon Press Taylor & Francis Group, ISBN 0-415-25071-4
Munson et al., Fundamentals of fluid mechanics, Wiley, ISBN 0-471-44250-X

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

Oral examination

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

Oral examination

Examination methods in case of permanent evaluation

Assignment

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 (period aligned evaluation): 40%

Exercises (non-period aligned evaluation): 60%

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