UNIVERSITY OF GOTHENBURG

DEPARTMENT OF EARTH SCIENCES

GV2002 Hydrology and hydrogeology, 7.5 credits

Hydrologi och hydrogeologi, 7,5 högskolepoäng

First Cycle

Confirmation

This course syllabus was confirmed by Department of Earth Sciences on 2020-01-14 and was last revised on 2023-05-03 to be valid from 2023-08-28, autumn semester of 2023.

Field of education: Science 100%
Department: Department of Earth Sciences

Position in the educational system

The course includes 7.5 credits at the undergraduate level. The course is offered as an elective course subject to availability.

The course can be part of the following programmes: 1) Bachelor's Programme in Earth Sciences (N1GVS) and 2) Bachelor of Science in Environmental Science (N1MVN)

Main field of studies	*Specialization*
Earth Sciences	G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

Entry requirements

For admission to the course, at least 45 credits in the main field of Earth Sciences, Geography, Environmental Science or Marine Science is required. In addition, approved knowledge in basic Earth Sciences is required, the course GV1410 Geosciences, Basic Level Course, 30 credits, or equivalent. Students with equivalent education may be admitted to the course after review and approval.

Learning outcomes

On successful completion of the course the student will be able to:

Knowledge and understanding

- understand important concepts and basic concepts in hydrology and hydrogeology and the management of water resources.
- understand and describe the role of water and the importance of different types of water resources within the hydrological cycle, and its relevance to the humanity and the ecosystem.
- understand and use relevant terminology.
- understand the most important theoretical concepts in hydrology and hydrogeology.
- understand the main application areas and the most important hydrological methods.

Competence and skills

- conduct, on a basic level, calculations and use basic hydrological or hydrogeological methods.
- characterize a hydrological or hydrogeological issue, choose method and define the necessary data needed to analyze and solve the issue.

Judgement and approach

- characterize a hydrological or hydrogeological issue, its consequence for the environment, the necessary data needed for a detailed investigation and the method/tool best suited for solving the issue.

The course is sustainability-related, which means that at least one of the learning outcomes clearly shows that the course content meets at least one of the University of Gothenburg's confirmed sustainability criteria.

Course content

The course provides a basic view of all aspects of hydrology, without in-depth in specific areas. The main focus of the course is groundwater. The course aims to give the students an understanding of the variety of hydrological or hydrogeological issues, different applications, concepts and methods.

The course focuses on the quantitative water-related aspects. Qualitative aspects (water chemistry) are treated to a lesser extent. The course provides an introduction to hydrology and hydrogeology and is not intended to to give the students the knowledge required to performs hydrological / hydrogeological projects on a professional level.

Sub-courses

1. **Theory** *(Teori),* 4 credits
   Grading scale: Pass with Distinction (VG), Pass (G) and Fail (U)

- Introduction to the management of water resources, the relevance and importance of water environment and society.
- Introduction to the various parts of the hydrological cycle with emphasis on groundwater, introduction of methods that describe and quantify important processes such as precipitation, discharge, recharge, evaporation, etc.
- Basic introduction to hydrology, its role in geosciences and its main application.
- Introduction to the main principles of hydrogeology and hydrology, introduction to relevant concepts, terminology, processes and its mathematical description.
- Basic introduction to hydrogeological and hydrological methods (theory); field and laboratory measurements and hydrogeochemistry.

2. **Exercises** *(Övningar),* 1.5 credits

   Grading scale: Pass (G) and Fail (U)
   - Computer-based exercises to apply the concepts, discussed in the theoretical part of the course.
   - Mainly based on GIS (ArcGIS) and Excel.

   The students work in smaller groups with a brief report (compilation of results, maps etc.), needs to be submitted within given time-frame.

3. **Project** *(Grupparbete),* 2 credits

   Grading scale: Pass (G) and Fail (U)
   - Oral presentation at seminar.
   - Write a report in a selected topic in hydrology.

Form of teaching

The teaching consists of lectures, laboratory, field-work, computer exercises, group project, and oral presentations.

Language of instruction: English

Assessment

1. Theory, 4 credits: Written exam.

2. Computer exercises, 1,5 credits: Written report / solving problems.

3. Project, 2 credits: Oral presentation and written report.

If a student who has twice received a failing grade for the same examination component wishes to change examiner ahead of the next examination session, such a request should be made to the department in writing and should be approved b the department unless there are special reasons to the contrary (Chapter 6 Section 22 of the Higher Education

Ordinance).

If a student has received a recommendation from the University of Gothenburg for study support for students with disabilities, the examiner may, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, decide to allow the student to sit an adjusted exam or alternative form of assessment.

In the event that a course has ceased or undergone major changes, students are to be guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, but no longer than two years after the course has ceased/been changed. The same applies to internships and professional placements (VFU), although this is restricted to just one additional examination session.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
For the grade Pass (G) in the course as a whole, at least Pass (G) are required for all parts in the course, including the computer-based exercises and the group project. For the grade Pass with Distinction (VG), the grade Pass with Distinction (VG) is required on the written exam.

Course evaluation

The students are given the opportunity to make an anonymous written evaluation of the course.

The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.

Additional information

Students admitted to N1GVS Bachelor's Programme in Earth Sciences are given priority for admission to the course.