Faculty of Science

GEOC08, Geology: Underground Pollution, 15 credits

Geologi: Förorenad mark, 15 högskolepoäng

First Cycle / Grundnivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2017-09-06 to be valid from 2017-09-06, spring semester 2018.

General Information

The course is an elective first cycle component of a degree of Bachelor or Master of Science (120 credits) in Geology or Environmental Science.

Language of instruction: Swedish

Main field of studies	*Depth of study relative to the degree requirements*
Geology	G2F, First cycle, has at least 60 credits in first-cycle course/s as entry requirements
Environmental Science	G2F, First cycle, has at least 60 credits in first-cycle course/s as entry requirements

Learning outcomes

Solid knowledge of geology is a prerequisite for investigation and management of anthropogenic pollution damaging soil and groundwater and potentially affecting human health negatively. The course focuses on this important application of geology and takes as its point of departure the environmental quality objective "A Non-Toxic Environment". The overall aim of the course is to provide students with basic knowledge in the area of underground pollution for professional activities from a societal perspective.

Knowledge and understanding

On completion of the course, the students shall be able to

- account for different types of underground pollution and their properties
- account for different types of remediation methods and the conditions for which they are suitable

Competence and skills

On completion of the course, the students shall be able to

- find and assess historical data and other relevant background information concerning polluted areas
- plan and conduct a study of a polluted area
- construct a general geological map of a polluted area including description thereof

Judgement and approach

On completion of the course, the students shall be able to

- make assessments of polluted areas with regard to the hazardousness and levels of pollution, the sensitivity and protection value, and the likelihood of pollutant spreading
- interpret geological maps with regard to the likelihood of pollutant spreading in different media

Course content

The course consists of five modules with the following focus areas, scopes and components:

Module 1: Introduction and Case Studies, 1.5 credits

- The national environmental objectives with regard to underground pollution
- The environmental quality objective "A Non-Toxic Environment"
- The general issues of underground pollution
- Introduction to the methodology of inventory of and investigation of contaminated areas
- Risk assessment of underground pollution
- Case studies of sites with a history of pollution

Module 2: Theory and Study Visits, 4 credits

- The Swedish Environmental Protection Agency's guidelines
- Methodology for inventory of polluted areas
- Preparatory studies
- Inventory of source material
- Overview investigation
- The provisions with regard to underground pollution in the Environmental Code

Module 3: Types of Pollution and Methods of Remediation, 1.5 credits

- Different types of remediation methods
- Different types of pollutants and their properties
- Remediation methods adapted to different types of pollutiants and different geological/hydrogeological conditions

Module 4: Planning and Execution of Investigations, 6 credits

- Construction of a general geological map in the field
- Geological/hydrogeological description of a fictitious contaminated area
- Writing of an individual report about a fictitious polluted area

Module 5: Transport Modelling of Pollutants, 2 credits

- Transport modelling of different pollutants from a fictitious landfill

Course design

The teaching consists of lectures, computer exercises, field exercises, seminars and project work. Participation in computer exercises, field exercises, seminars, project work and associated elements is compulsory.

Assessment

The assessment is based on a written exam, seminar performance, project reports, and written and oral presentations. Students who failed the first exam opportunity will be offered an additional exam opportunity soon thereafter.

In order for a permanently disabled student to be offered an examination opportunity equivalent to that of a non-disabled student, the examiner may, after consultation with the University's Disability Support Services, decide about an alternative form of examination for the student concerned.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
For a grade of Pass on the whole course, the student must have passed the exam, the project reports, and the written and oral presentations, as well as participated in all compulsory components. The final grade is determined by the aggregated results of the assessed components in proportion to their extent (see appendix).

Entry requirements

To be admitted to the course, students must meet the general entry requirements and have 75 credits of science studies including one of the courses GEOA01 Planet Earth-An Introduction, 15 credits, or GEOA82 Earth, Water and the Environment, 15 credits, or an equivalent course providing basic knowledge within geology.

Further information

The course may not be included in a degree of Bachelor or Master (120 credits) of Science in Geology or Environmental Sciences together with GEOP02 Geology: Inventory and Classification of Contaminated Sites, 15 credits, or GEOP04: Environmental Soil Investigations, 15 credits.

Subcourses in GEOC08, Geology: Underground Pollution

Applies from V18

1701 Introduction and Case Studies, Seminar, 1,5 hp
Grading scale: Fail, Pass, Pass with distinction
1702 Theory and Study Visit, Written Examination, 4,0 hp
Grading scale: Fail, Pass, Pass with distinction
1703 Pollution Types and Remediation Methods, Seminar, 1,5 hp
Grading scale: Fail, Pass, Pass with distinction
1704 Investigations, Project Report and Seminar, 6,0 hp
Grading scale: Fail, Pass, Pass with distinction
1705 Transport Modelling, Project Report and Seminar, 2,0 hp
Grading scale: Fail, Pass, Pass with distinction
1706 Mandatory Learning Activities, 0,0 hp
Grading scale: Fail, Pass