



Faculty of Science

## **GEOB23, Geology: Sedimentology, Geomorphology and Structural Geology, 15 credits**

*Geologi: Sediment, landformer och strukturer, 15 högskolepoäng*  
**First Cycle / Grundnivå**

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### **Details of approval**

The syllabus is an old version, approved by Study programmes board, Faculty of Science on 2016-09-17 and was valid from 2017-01-01, spring semester 2017.

### **General Information**

The course is a compulsory first cycle component of a Bachelor of Science in Geology.

*Main field of studies*

Geology

*Depth of study relative to the degree requirements*

G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

### **Learning outcomes**

The course forms part of a series of six compulsory courses, which aims at providing basic knowledge within a broad range of geological disciplines.

### **Knowledge and understanding**

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

- account for the geomorphological system from a global and geological perspective
- identify and describe the large-scale and small-scale landforms of Earth's surface
- describe and explain dominating processes, lithological properties and spatial distributions of sediments in different continental and marine depositional environments, as well as account for the relationship between sediments and

landforms in these environments

- use sediments or landforms to interpret formation processes and conditions
- provide a general explanation of how depositional environments and sedimentary basins are affected by changes in the global climate and sea level as well as by plate-tectonic movements
- account for fundamental concepts in structural geology
- account for fundamental properties of geological materials during deformation at brittle and ductile conditions
- identify, describe and classify deformation structures and tectonites, and explain their origins
- account for how deformation structures are linked in large-scale tectonic systems

### **Competence and skills**

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

- describe sedimentary stratigraphies in an objective way, and compile and present the descriptions in a graphical log
- perform facies analysis for interpretation and reconstruction of sedimentary processes and environments
- apply common geological analytical methods and approaches and conduct sedimentological field studies and laboratory investigations of stratigraphies in sediments and sedimentary rocks, and describe and interpret the results in a written report
- use aerial photos, satellite images or terrain models for identification of exogenic and endogenic landforms
- perform basic documentation and interpretation of deformation structures
- execute basic constructions in stereographic projection and basic profile construction
- construct informative and clear illustrations in the form of photos as well as hand-drawn and computer-based figures

### **Judgement and approach**

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

- justify choices of common geological analytical methods and approaches in the field and in the laboratory for studies and descriptions of different types of sediments, landforms and structures
- make a general assessment of uncertainties in the interpretation of processes and environments based on sediments, landforms and structures

### **Course content**

The course consists of two modules:

**Module 1: Sedimentology and Geomorphology, 7.5 credits**

Module 1 contains the following components in fundamental sedimentology and geomorphology:

- The geomorphological system: the rock cycle, the water cycle, denudation and sedimentation. Geomorphology from global and geological perspectives
- Karst landscapes and other landforms formed through weathering
- Sediments and landforms in alluvial, arid and periglacial environments, deltaic environments, clastic coasts and shallow coastal environments, carbonate platforms, and pelagic and hemi-pelagic deep-sea environments
- Landform systems and facies models for the above-mentioned continental and marine environments
- Landforms shaped by igneous processes and landforms related to plate tectonics, and erosional landforms governed by structures in bedrock
- Fieldwork project including logging, photo documentation and laboratory analyses
- Geomorphological remote sensing

**Module 2: Structural Geology, 7.5 credits**

Module 2 contains the following components in basic structural geology:

- Basic concepts, such as stress and strain, and basic mechanics
- Origin and classification of different deformation structures, including folds, faults, fault and shear zones, and tectonites
- Different tectonic environments: thrust systems, normal fault systems and strike-slip systems
- Large-scale structures of sedimentary basins with a focus on basin evolution in relation to different plate-tectonic environments
- Exercises in the form of measurement of planar and linear structures, evaluation of measurement data in stereographic projection, and interpretation of geological maps
- Field studies focusing on practical training in the identification, description, measurement and interpretation of deformation fabrics and deformation structures

**Course design**

The teaching consists of lectures, field and laboratory exercises, seminars, group exercises and project work. Compulsory participation is required in the field and laboratory exercises, seminars, group exercises and project work, and associated elements.

## **Assessment**

The assessment is based on written exams throughout the course, on project reports and other written assignments, and on compulsory components.

Students who failed the first exam opportunity will be offered an additional exam opportunity soon thereafter.

*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 Pass on the whole course, the student must have passed the exams, the reports and written assignments, and the compulsory components. The final grade is determined by the aggregated results of the different assessed components in proportion to their scope (see appendix).

## **Entry requirements**

To be admitted to the course, students must meet the general entry requirements and have passed GEOA01 Planet Earth ? An Introduction, 15 credits, GEOA81 Geology: Earth, Water and the Environment, 15 credits, or the equivalent.

## **Further information**

The course may not be included in a degree together with GEOB02 Climatology and Geomorphology, 15 credits, GEOB03 The Lithosphere, 15 credits, GEOB04 Sedimentology, 15 credits, GEL303 Climatology and Geomorphology, 10 credits, GEL304 The Lithosphere, 10 credits or GEL305 Sedimentology, 10 credits.

## Subcourses in GEOB23, Geology: Sedimentology, Geomorphology and Structural Geology

Applies from V17

- 1601 Sedimentology and Geomorphology, written examination, 5,5 hp  
Grading scale: Fail, Pass, Pass with distinction
- 1602 Sedimentary Environments, written examination, 2,0 hp  
Grading scale: Fail, Pass, Pass with distinction
- 1603 Structural Geology, written examination, 7,5 hp  
Grading scale: Fail, Pass, Pass with distinction
- 1604 Mandatory Learning Activities, 0,0 hp  
Grading scale: Fail, Pass