Faculty of Science

GEOB33, Geology: Sedimentology and Structural Geology, 15 credits

Geologi: Sedimentologi och strukturgeologi, 15 högskolepoäng

First Cycle / Grundnivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2021-05-19 to be valid from 2021-05-19, spring semester 2022.

General Information

The course is a compulsory course at first cycle level for a Degree of Bachelor of Science in geology.

Language of instruction: Swedish

Main field of studies	*Depth of study relative to the degree requirements*
Geology	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 of professional relevance within a broad range of geological disciplines. Theoretical knowledge and practical skills in sedimentology and structural geology will form the basis for understanding of formation processes as well as compostion and documentation of sediments and structures in unconsolidated deposits and bedrock.

Knowledge and understanding

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

- identify and describe sedimentary structures and lithofacies
- account at a general level for fundamental concepts and phenomena in fluid dynamics that are relevant for sediment transport and deposition
- account for and use fundamental stratigraphic principles and lithostratigraphic nomenclature

- describe and explain the characteristics of various continental, coastal and marine depositional environments concerning dominating processes, spatial distribution of sediments as well as lithological properties
- explain how large-scale sedimentation patterns are influenced by relative sea-level change at a general level
- account at a general level for how plate-tectonic processes influence the structural geological construction of the earth's crust
- 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, as well as explain their origins
- account for how deformation structures are linked in large-scale tectonic systems

Competence and skills

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

- describe sediments and sedimentary stratigraphies in an objective way, as well as compile and present the results in a graphical log
- carry out facies analysis for interpretation and reconstruction of sedimentary processes and environments
- apply common analytical methods and approaches and carry out sedimentological field studies and laboratory investigations of stratigraphies in sediments and sedimentary rocks
- identify and interpret structures and landforms from remote sensing data
- perform basic documentation and interpretation of deformation structures
- use stereograms to interpret and present structural data
- interpret bedrock construction in three dimensions from geological maps
- use correct geological technical language to describe and interpret analytical results in a written report
- construct informative and clear illustrations in the form of photographs and figures

Judgement and approach

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

- justify choices of common analytical methods and approaches in the field and in the laboratory for studies and descriptions of various types of sediments and structures
- demonstrate insight into how sedimentological and structural geological knowledge may play a role in society and for sustainability

Course content

The course consists of two parts with the following content.

Part 1, Sedimentology (7.5 credits):

- Fundamental concepts and principles in sedimentology and stratigraphy
- Sediment and facies models in various continental, coastal and marine environments, as well as their applications and relevance
- Sedimentological laboratory work including i.a.. grain-size analysis
- Fieldwork project including i.a. logging and photo documentation

Part 2, Structural Geology (7.5 credits):

- Fundamental 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
- Exercises in the form of measurement of planar and linear structures, evaluation of measurement data in stereographic projection, as well as interpretation of geological maps and remote sensing
- Field studies that focus on practical training in identification, description, measurement and interpretation of deformation fabrics and deformation structures
- Relevance and applications of structural geological data and models, both for the understanding of geological processes and for societal demands

Course design

The teaching consists of lectures, field and laboratory exercises, seminars, group work and project work. Participation in the field and laboratory exercises, seminars, group work and project work, as well as thereby integrated other teaching, is compulsory.

Assessment

Examination takes place in writing in the form of reports and examinations during the course, as well as through participation in compulsory modules. Students who failed the first exam opportunity will be offered an additional exam opportunity soon thereafter.

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.
The marking scale for written reports and mandatory learning activities is Fail, Pass.

To pass the entire course, approved examinations, approved reports and passed compulsory components are required. The final grade is decided through a joint assessment of the results of the examinations of the included modules. The weighting is based on the extent of the two parts (50/50), judging from the results of the written examinations.

Entry requirements

For admission to the course, general entry requirements are required, as well as GEOA02 Planet Earth - an Introduction, 15 credits, GEOA82 Geology: Earth, Water and the Environment, 15 credits, or the equivalent knowledge.

Further information

The course may not be included in a degree together with GEOB23 Sediments, Structures and Landforms, 15 credits.

Subcourses in GEOB33, Geology: Sedimentology and Structural Geology

Applies from V22

2201 Methodology, written report, 1,0 hp
Grading scale: Fail, Pass
2202 Fieldwork, written report, 1,5 hp
Grading scale: Fail, Pass
2203 Sedimentology, written examination, 5,0 hp
Grading scale: Fail, Pass, Pass with distinction
2204 Structural Geology, written examination, 7,5 hp
Grading scale: Fail, Pass, Pass with distinction
2205 Mandatory Learning Activities, 0,0 hp
Grading scale: Fail, Pass