



Department of Earth and Environmental Sciences

GEOM12, Bedrock Geology: Sedimentary Geology and Basin Analysis, 15 credits

Berggrundsgologi: Sedimentär geologi och bassänganalys, 15 högskolepoäng
Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2022-12-06. The syllabus comes into effect 2022-12-06 and is valid from the autumn semester 2023.

General information

The course is an elective course in the second cycle for a degree of Master of Science in Geology, and a compulsory course in the second cycle for a degree of Master of Science in Applied Computational Science with specialization in Geology.

Language of instruction: English

Main field of study *Specialisation*

Geology A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The general aim of the course is to provide students with specialised theoretical and practical knowledge for documentation and interpretation of sedimentary sequences and to carry out basin analysis based on tectonic structures, sedimentary facies, geochemistry, sequence stratigraphy and geophysical bore-hole logging. Together with other second cycle courses in bedrock geology this knowledge will form the basis for advanced understanding of the environmental and climatic development in continental and marine environments in a time perspective of tens to hundreds of millions of years.

Knowledge and understanding

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

- account for the large-scale development of sedimentary basins in different plate-tectonic environments
- describe and explain the most common stratigraphic and geophysical methods for categorisation and interpretation of the structure, facies and temporal evolution of sedimentary basins
- account in detail for how relative sea-level changes and climate influence depositional systems and sedimentary environments with regard to processes and products
- account for how sediment geochemical methods can be used for interpretation of palaeoceanography and palaeoclimatology
- account at a general level for sedimentary basins in Scandinavia, specifically with regard to their formation and development
- account at a general level for the economic importance of sedimentary basins (petroleum, groundwater, carbon dioxide storage).

Competence and skills

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

- comprehend, critically assess and discuss scientific primary publications within the subject, communicate orally and in writing by means of subject-specific terminology, as well as use scientific reference techniques
- apply the most common methods for large-scale analysis of sedimentary basins; primarily sedimentary facies analysis, sequence stratigraphy and sedimentary geochemistry, secondarily be able to understand and at a general level analyse geophysical bore-hole data and seismic stratigraphy.

Judgement and approach

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

- assess and critically discuss views and conclusions expressed in primary research publications in the field.

Course content

The following topics are included in the course:

- Tectonic environments and large-scale tectonic evolution of sedimentary basins
- Sedimentary facies and facies analysis in continental and marine environments
- Diagenesis and its effects on sediments
- Sequence stratigraphy and sea-level changes
- Sedimentary geochemistry and isotope geochemistry
- Palaeoceanography and palaeoclimatology
- Logging and interpretation of drill cores
- Geophysical examination methods and their applications within basin analysis
- Field trips in Sweden or abroad
- Project Work, mainly based on scientific literature.

Course design

The teaching consists of lectures, field exercises, seminars, excursions, group work and project work. Participation in field exercises, seminars, group work and project work as well as associated components is compulsory.

Assessment

The assessment is based on a written exam at the end of the course, and project reports, excursion reports and exercise reports during the course.

Students who did not pass 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.

Grades

Grading scale includes the grades: Fail, Pass, Pass with distinction

For a Pass grade on the whole course, the student must have passed the written exam, the project report, the excursion report, all exercise reports and all compulsory components.

The grading scale for the written exam, the project report and the excursion report is Fail, Pass and Pass with distinction. The grading scale for compulsory elements are Fail and Pass.

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 have 90 credits in science studies, including 75 credits in geology.

Proficiency in English corresponding to English B/English 6 from Swedish upper secondary school.

Further information

The course may not be included in a degree together with GEOM10 Sedimentary Geology and Basin Analysis 15 credits, or GEOM07 Sedimentary Geology and Basin Analysis, 15 credits.

The course is offered at the Department of Geology, Lund University.