



LUND
UNIVERSITY

Faculty of Science

MATL02, Geometry for Teacher Students, 7.5 credits *Geometri för lärarstudenter, 7,5 högskolepoäng* First Cycle / Grundnivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2022-12-14 to be valid from 2022-12-14, autumn semester 2023.

General Information

The course is an elective course at basic level in mathematics with didactical focus. The course is part of a chain of course packages in mathematics which together provide eligibility for supplementary pedagogical training leading to a subject teacher's degree in mathematics. The course can also be given as a stand-alone course.

Language of instruction: Swedish

Main field of studies

Mathematics

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 overall goal of the course is that the students acquire knowledge in basic Euclidean geometry and are introduced to non-Euclidean geometry. Furthermore, the goal is for the students to plan and implement teaching sessions that are preparatory for the work-placement training that is part of the supplementary pedagogical education.

Knowledge and understanding

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

- use and give an account of basic mathematical concepts, methods, proofs and techniques in basic Euclidean geometry
- give an account of the content related to basic geometry contained in the current policy documents for elementary and upper secondary school.

Competence and skills

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

- identify, formulate and solve problems in basic Euclidean and non-Euclidean geometry
- use dynamic geometry software in connection with problem solving
- identify the logical structure of mathematical reasoning and carry out mathematical proofs, as well as communicate mathematical reasoning in speech and writing
- give an account of some parts of the history of mathematics related to Euclidean geometry and of how these can be used in teaching situations
- plan and carry out teaching session related to a selection of the course elements in Euclidean geometry.

Judgement and approach

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

- analyse and assess students' learning in basic geometry, proofs and problem solving
- assess and use formal treatment of mathematics.

Course content

The course treats:

- Euclidean geometry: Classical theorems in Euclidean geometry.
- Conducting proofs and problem-solving in geometry.
- Different axiomatisations of Euclidean geometry, orientation about non-Euclidean geometry.
- Problem-solving strategies including the use of software for dynamic geometry.
- Learning and teaching geometry in the later years of primary school and upper secondary school in relation to mathematics didactic research.
- Study resources for teaching mathematics in upper secondary school as well as policy documents in the form of course syllabi related to geometry.

Course design

The teaching consists of lectures, seminars and laboratory sessions. An essential part of the teaching sessions is training in problem-solving and oral mathematical communication. Planning and implementation of teaching sessions are included as compulsory parts of the course.

Assessment

The assessment is based on the following components of the different modules:

- computer laboratory sessions, 1.5 credits
- written presentation of problem-solving, 3 credits
- planning and implementation of teaching sessions, 3 credits

All examination parts are given during the course.

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.

To obtain the grade Pass on the entire course it is required to pass the computer laboratory exercises, the written presentation of problem-solving, as well as the planning and implementation of teaching sessions.

Entry requirements

Access to the course requires at least 45 credits in mathematics including knowledge corresponding to the courses MATA21 Analysis in One Variable 15 credits, MATA22 Linear algebra 1, 7.5 credits, MATB21 Analysis in Several Variables 1, 7.5 credits, MATB22 Linear algebra 2, 7.5 credits and one of the courses NUMA01 Computational programming with Python, 7.5 credits, or MATA23 Fundamentals of Algebra, 7.5 credits.

Further information

The course cannot be included in the degree together with the course ÄMAD04 Mathematics 4, 30 credits.

The course is given at the Mathematics Centre, Lund University.

Subcourses in MATL02, Geometry for Teacher Students

Applies from H23

- 2301 Computer laboratory sessions, 1,5 hp
Grading scale: Fail, Pass
- 2302 Written report of problem solving, 3,0 hp
Grading scale: Fail, Pass
- 2303 Planning and implementation of teaching, 3,0 hp
Grading scale: Fail, Pass