



Faculty of Health, Science and Technology
Mathematics

Syllabus

Mathematics for Teachers: Geometry

Course Code:	MAGK20
Course Title:	Mathematics for Teachers: Geometry <i>Matematik för lärare: Geometri</i>
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has at least 60 credits in first-cycle course/s as entry requirements (G2F)

Major Field of Study:
MAA (Mathematics)

Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2022-08-24, and is valid from the Spring semester 2023 at Karlstad University.

Prerequisites

150 ECTS credits, including Mathematics 30 ECTS credits

Learning Outcomes

Upon completion of the course, students should be able to:

- explain and discuss an axiomatic-deductive system based on Euclid's Elements and analyse geometry from a historical perspective,
- explain and apply important geometric definitions and theorems in Euclidean geometry and perform and analyse proofs of geometric theorems,
- solve problems in Euclidean geometry and compare and assess different solutions and approaches,
- perform and analyse constructions with compass and ruler as well as mathematical software,
- solve geometric problems in analytical geometry with a focus on conic sections and their

equations,

- apply vector geometry and analytical geometry to solve problems regarding distance and angles on a spherical surface, and
- use and analyse the use of dynamic geometry software.

Content

- Axiomatic deductive systems
- Classic Euclidean geometry and geometrical problem solving: definitions, theorems, and proofs with a focus on the geometry of circles and triangles
- Constructions with compass and ruler as well as dynamic geometry software
- Analytical geometry with a focus on conic sections and their equations
- Non-Euclidean geometries with a focus on spherical geometry: spherical coordinates and vector geometry applied to an idealised globe and spherical trigonometry
- Historical perspectives on geometry, the role of geometry in mathematics as a school subject, and pedagogical adaptations of geometry from an educational perspective

Reading List

See separate document.

Examination

Assessment is based on an individual written exam and an individual assignment involving dynamic software presented in writing.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades

One of the grades Distinction (VG), Pass (G), or Fail (U) is awarded in the examination of the course.

Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional information

The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.

The course MAGK20 cannot be included in the same degree programme as the courses MAGL05, MAGL12, MAGB10 or any other basic course in geometry.