Linnæus University

Course syllabus

Faculty Board of Science and Engineering
School of Computer Science, Physics and Mathematics

1MA161 Geometri och algebra, 7,5 högskolepoäng
Geometry and algebra, 7.5 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved by the Board of the School of Computer Science, Physics and Mathematics 2009-08-11

Revised 2010 08-04. Revision of prerequisites and course evaluation.

The course syllabus is valid from spring semester 2011

Prerequisites
Basic Mathematics 7.5 credits, Vector Geometry 7.5 credits or equivalent.

Expected learning outcomes
The student should be able to:

- describe, in a broad sense, the structure of Euclid´s Elements, and of axiomatic systems in general
- solve problems of Geometry concerning triangles and circles
- account for the interplay between Geometry and Algebra
- know basic parts about Conic Sections, and be able to solve problems in that area, mostly concerning tangents and normals
- know the basic Projective Geometry, and be able to solve some basic problems in that area
- derive the symmetry groups for plane figures
- account for three classic geometric "unsolvable" problems
- compare different approaches to geometric problems.

Content

- Measuring of lengths, areas and volumes
- Euclid´s Element. Axiomatic systems

- Theorems about triangles and circles
- Constructions with ruler and compasses
- Problem solving
- Geometry and algebra – an interplay. Symmetry groups of plane figures
- Conic Sections
- Projective Geometry. basic elementary parts; theoremes of Desargues, Pascal, Brianchon and Pappus.
- Three classical ”unsolvable” geometric construction problems; something about number fields.

Type of Instruction
Lectures and seminars. Compulsory assignments may be given during the course.

Examination
The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).
On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

The student’s knowledge is assessed in the form of written examinations. Furthermore, continuous assessment can be used during the course.

Course Evaluation
A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Required Reading and Additional Study Material
Required Reading
Anders Tengstrand. *Åtta kapitel om geometri*. Studentlitteratur, 2005. 240 (311) pages.