



# AH2922 Map Projections and Reference Systems 9.0 credits

## Kartprojektioner och referenssystem

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for AH2922 valid from Autumn 2008

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

Second cycle

## Main field of study

## Specific prerequisites

AH1811 Geodetic Surveying

AH2921 Adjustment theory

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

After completing this course, students should

- understand coordinate systems used in geodesy and navigation
- be able to compute geodetic lines on the reference ellipsoid
- have insights on different types of map projections and their characteristics
- understand how different geodetic reference systems are constructed
- know how to make transformation among different reference systems

## Course contents

- Geometry of the reference ellipsoid
- Coordinate systems on the ellipsoid
- Computation of geodetic lines
- Classification of map projections.
- General projection theory
- Deformation characteristics.
- Gauss-Krüger projection and UTM. Azimuthal projections
- Gravity, geoid and height systems
- Astrogeodetic triangulation networks
- Geodetic astronomy: celestial coordinates, concept of time and astronomical positioning
- Earth rotation: polar motion, precession and nutation
- Geodynamics: tectonics, postglacial rebound and earth tide
- Celestial vs terrestrial reference systems (frames)
- Existing reference frames: ITRF, WGS 84, EUREF 89 and Swedish geodetic networks
- Least squares estimation of Helmert transformation parameters

## Disposition

Lectures:

36h Laboration:

48h

## Course literature

Fan (2008). Theoretical Geodesy. KTH.

## Examination

- LAB1 - Laboratory work, 4.0 credits, grading scale: P, F
- TEN1 - Examination, 5.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

## Other requirements for final grade

Written exam (TEN1; 5c)

Approved laboration (LAB1; 4c)

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.