



AH2923 Global Navigation Satellite Systems (GNSS)

7.5 credits

Globala satellitnavigeringssystem (GNSS)

Course syllabus for AH2923 valid from Spring 17

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

Grading scale: A, B, C, D, E, FX, F

Education cycle: Second cycle

Main field of study: -

Intended learning outcomes

Theoretical and practical basics of satellite positioning by the global systems: GPS, GLONASS, Galileo, etc. An introduction also to other geodetic satellite methods.

After the course, students will be able to:

- describe the principle of satellite positioning methods, the main components in a satellite navigation system and their functions
- account for and analyse the influence of different error sources on the positioning precision
- plan, perform and process precise GNSS measurements
- identify proper instruments, measurement and processing methods for different applications

Course main content

- Estimation and representation of satellite orbits
- Geodetic reference systems and time systems
- GNSS satellite signals and signal transmission through the atmosphere
- Estimation of positions with GNSS satellite observations
- Differential and relative positioning
- Carrier phase based positioning and estimation of ambiguities
- Statistical methods with Kalman filter and smoothing
- Applications of GNSS

Disposition

Lectures 24h

Laborations 40h

Language of instruction

Language of instruction is specified in the course offering information in the course and programme directory.

Eligibility

For admitted students to the Master of Science in Civil Engineering and Urban Management (CSAMH) or one of the Master of Science programmes in Transport and Geoinformation Technology (TTGTM), Aerospace Engineering (TAEEM), or Electrophysics (TELFM), there are no additional requirements.

For other students:

- A completed bachelor's degree in civil engineering, urban planning, geomatics, geography, engineering physics, computer science, statistics, economics, and/or mathematics, including at least 6 university credits (hp) in each of the following or their equivalents: Programming, Linear Algebra, Calculus in One Variable, and Probability & Statistics; and
- Documented proficiency in English corresponding to English B.

Literature

Hofmann-Wellenhof, et al. (2008): GNSS, Springer

Examination

- LAB1 - Laboratory Work, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Written exam 4.5 credits, grading: A, B, C, D, E, FX, F
- LAB1 - Approved laboratory reports 3 credits, grading: P, F

Requirements for final grade

Examination, approved laboratory work