FAG5130 Satellite Based Positioning 7.5 credits

Satellitbaserad positionering

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

Establishment

Course syllabus for FAG5130 valid from Spring 2015

Grading scale

G

Education cycle

Third cycle

Specific prerequisites

Knowledge about the principles of GPS/GNSS positionering, excperience with GNSS data collection and processing, knowledge about least squares adjustment at a level corresponding to M.Sc.

Language of instruction

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

Intended learning outcomes

After the course the student should be able to:

- understand in detail the algorithms and data processing steps necessary to estimate a position based on GPS/GNSS data
- understand the error sources related to positioning based on GPS/GNSS, and the most common models and algorithms used to compensate for the errors
- understand and explain the principle of ambiguity resolution
- understand and explain different methods for positioning with GPS/GNSS
- understand and explain the difference between single point positioning and precise point positioning
- implement Matlab scripts necessary to estimate a position from GPS/GNSS code and carrier phase data

Course contents

During the course the student must develop the necessary routines in Matlab to estimate positions based on GPS code and carrier phase data. The student must answer a number of questions related to error sources, modeling of error sources, various positioning techniques as well as ambiguity resolution. In order to provide the answers the student must implement relevant scripts using Matlab.

Answers to the questions, along with documentation of the code used, must be provided in a report for evaluation by the teacher.

Course literature

Hofmann-Wellenhof, Bernhard, Lichtenegger, Herbert, Wasle, Elmar, 2008. GNSS – Global Navigation Satellite Systems. Springer, Wien, New York.

Current papers on precise point positioning (PPP) and ambiguity resolution.

Examination

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.

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

Other requirements for final grade

Evaluation of written report and matlab scripts.

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.