FAG5127 Satellite Gravimetry 7.5 credits

Satellit gravimetri

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

Establishment

Course syllabus for FAG5127 valid from Spring 2019

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Advanced Physical Geodesy

Language of instruction

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

Intended learning outcomes

This course concerns both the theory and application of observing the Earth's gravity fields from

space-borne platforms. After the course the student is expected to be able to:

- explain the observation procedures including orbital mechanics,
- illustrate satellite gravimetry data signal propagation, errors and uncertainties,
- describe concepts of current satellite missions such as radar and laser altimetry, space gravimetry and gradiometry,
- use satellite gravimetry data for studying tectonics, geodynamics, ocean and ice surface monitoring, hydrology, and terrain modeling.

Course contents

The purpose of the course is the use of satellite gravimetry data in a broad range of geo-scientific applications. The main topics are:

- Satellites in orbit (orbits, forces, orbit determination, error sources),
- Gravimetry (satellite gravimetry and gradiometry concepts, orbit analysis, Earth's gravity field, current missions),
- Altimetry (radar and laser altimetry, past and current missions, working with altimetry data)
- Satellite gravimetry applications (Solid Earth, oceans, ice/sea ice, hydrology; gravity, geoid, datum unification, magnetic field, surface monitoring and climate change).

Course literature

- Flury J. and Rummel R. Future Satellite Gravimetry and Earth Dynamics, ISBN 978-0-387-33185-0.
- Visser PNAM (1992) The use of satellites in gravity field determination and model adjustment, Delft University of Technology,
- Koop R. (1993) Global gravity field modelling using satellite gravity gradiometry, Delft U.T.
- Sneeuw N. (2000) A semi-analytical approach to gravity field analysis from satellite observations, DGK, Series C, No. 527, Munich.
- Rummel R, G Balmino, J Johannessen, P Visser, P Woodworth, (2002). Dedicated gravity field missions—principles and aims. Journal of Geodynamics 33 (1), 3-20
- Scientific papers downloadable via the university’s library.

Examination

- PRO1 - Project, 5.0 credits, grading scale: P, F
- SEM1 - Seminar, 2.5 credits, grading scale: P, 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.

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

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.