



# FAG5125 Geodynamics 7.5 credits

## Geodynamik

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

## Establishment

Course syllabus for FAG5125 valid from Spring 2019

## Grading scale

P, F

## Education cycle

Third cycle

## Specific prerequisites

Advanced Physical Geodesy

Satellite gravimetry

Satellite Positioning

1N5113 Theory of Science and Research Methods, Technological and Natural Sciences.

## Language of instruction

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

# Intended learning outcomes

The aims of the course are:

- To develop a comprehensive understanding of the Earth physical system,
- To provide the skills necessary to model large scale geodynamic processes

After the course the student is expected to be able to:

- Achieve knowledge on the physics of the Earth's interior,
- Understand the quantitative aspects of plate tectonics and the earth's structure,
- Describe stress and Strain in Solids ,
- Understand the problems related to climate changes and geodynamics,
- Explain principle of isostasy.

## Course contents

To give the student a general knowledge of ongoing geodynamic processes with emphasis on interpretation on geodetic data. The main topics are:

- Earth rotation and global dynamic processes (Earth rotation, polar motion, Reference Frames, nutation and precession),
- The Gravity Field of the Earth (Potential theory, geoid),
- Mass transport and mass distribution in the Earth system,
- Earth tides,
- Isostasy and compensation and their applications in Earth modelling,
- Tectonics and Crustal Deformation (Plate kinematics, continental drift, seafloor spreading),
- Sea surface topography and sea level changes (climate change studies),
- Effects of the Earth's fluid layers (e.g. post-glacial rebound, loading) and applications,
- Stress and Strain in Solids

## Course literature

- Geodynamics: Applications of continuum physics to geological problems, 2nd Ed. by D.L Turcotte and G. Schubert, Cambridge University Press, 2001 (T&S).
- Fowler C M R (1990) The solid earth: an introduction to global geophysics. Cambridge University Press.
- David E. Smith, Donald L. Turcotte, (2013). Contributions of Space Geodesy to Geodynamics: Earth Dynamics. Published Online: 15 MAR 2013. DOI: 10.1029/GD024. Online ISBN: 9781118669723.
- 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.