



# SG2805 Spacecraft Dynamics

## 9.0 credits

Rymdfarkosters dynamik

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 SG2805 valid from Autumn 2011

### Grading scale

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

### Education cycle

Second cycle

### Main field of study

Technology

### Language of instruction

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

### Intended learning outcomes

The overall aim of the course is that you should be familiar with basic concepts of satellite dynamics and control. Particular focus is placed on satellite attitude control. You should also be acquainted with the sensors and actuators used for attitude control. Finally, you should know the characteristics of propulsion systems used in space and be able to perform preliminary analysis and design of a satellite.

## Course contents

The theory of attitude control is covered and discussed in relation to the sensors and actuators that are used. An overview of propulsion systems is given with an in depth treatment of a few basic concepts. The students are given a preliminary design project of a given micro satellite including attitude control, propulsion system and sensor configuration.

Dynamic Systems Modeling - Dynamic Systems Control - Orbital Dynamics and Control  
- Orbital Dynamics - Orbital Maneuvers and Control - Attitude Dynamics and Control - Rotational Kinematics - Rigid Body Dynamics - Rotational Maneuvers and Attitude Control  
- Structural Dynamics and Control - Structural Dynamics - Attitude and Structural Control  
- Robust Optimal Maneuvers

## Specific prerequisites

Recommended prerequisites: Previous knowledge corresponding to SD2805 Flight Mechanics and SD2815 Rocket science or permission from the coordinator.

## Course literature

Suggested course literature will be found on the course home page. Presently, the standard text book is:

B. Wie, Space Vehicle Dynamics and Control, 2nd edition, AIAA Education Series, 2008.

## Examination

- PRO1 - Project, 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

PRO1 – Project, 4.0 cr, grade scale: A, B, C, D, E, FX, F

TEN1 – Examination, 5.0 cr, grade scale: A, B, C, D, E, FX, F

## 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.