SG2805 Spacecraft Dynamics 9.0 credits

Rymdfarkosters dynamik

Course syllabus for SG2805 valid from Autumn 11

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: Technology

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 main content

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

Language of instruction

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

Eligibility

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

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

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