



SD2805 Flight Mechanics 9.0 credits

Flygmekanik

Course syllabus for SD2805 valid from Autumn 07

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

Grading scale:

Education cycle: Second cycle

Main field of study: -

Intended learning outcomes

The **overall objectives** of the course are that you should be able to:

- *formulate* equations of motion for an aircraft in atmospheric flight,
- *motivate* the assumptions made to simplify a flight mechanics problem,
- *analyze* equilibrium and stability for an aircraft,
- *explain* the basic modes of motion and related mechanisms of an aircraft,
- *design* a basic control system using simplified equations of motion,
- *perform* simple trajectory calculations by integrating the equations of motion in time,
- *present* your results in a well written report.

Course main content

The course is based on lectures, the contents of which are applied in wind-tunnel testing and during computer labs. The exercises are performed in groups but the results must be presented individually. The first assignment in the course is a short introduction to Matlab, since the main part of the analysis is performed in this program. Here you can build your own "toolbox" to use in the successive assignments.

Parallel to the lectures you apply the theory in different labs where you also have to use your knowledge from earlier courses in aeronautics, solid mechanics, numerical methods and linear algebra. The course treats general equations of motion for aerial vehicles, models of aircraft and the atmosphere, and conditions for equilibrium. Thereafter linearization and solution of equations of motion. This forms the basis for analysis of trajectories, modes of motion as well as control analysis and synthesis. The course also gives an orientation on sensors and actuators.

Language of instruction

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

Eligibility

SD2600 Aircraft Performance Analysis and preferably SD2800 Experimental Aerodynamics or permission from the coordinator.

Literature

Etkin, B. and Reid, L. D. Dynamics of Atmospheric Flight: Stability and Control. John Wiley & Sons, 1996.

Examination

- LAB1 - Laboratory Work, 3.0 credits, grading scale: P, F
- PRO1 - Project, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 3.0 credits, grading scale: P, F

Requirements for final grade

Laboratory work (LAB1; 3 university credits)

Written exam (TEN1; 3 university credits)

Project assignment (PRO1; 3 university credits)