FEL3210 Multivariable Control 8.0 credits

Flervariabel Reglering

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 FEL3210 valid from Spring 2012

Grading scale

Education cycle

Third cycle

Specific prerequisites

Language of instruction

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

Intended learning outcomes

After completing the course, the student should be able to:

- describe and explain the general principles for analysis and synthesis of linear multivariable robust control systems.

- model uncertainty in linear dynamic systems
- quantify the achieveable control performance for a given system
- design multivariable controllers for robust performance
- contribute to the research front in the main areas covered by the course

Course contents

Multivariable frequency response analysis, directionality in MIMO systems (SVD), input-output controllability, uncertainty models, linear fractional transformations, robustness analysis including the structured singular value, mu-synthesis, H2- and H-infty controller synthesis, H-infty loop shaping, Glover-MacFarlane robust loops- haping, gap metrics, linear matrix inequalities, control structures.

Disposition

Lectures, homeworks, 72h take home exam

Course literature

- Skogestad and Postlethwaite, Multivariable Feedback Control - Analysis and Design", 2nd ed, Wiley, 2007
- Supporting text: Zhou, "Essentials of Robust Control", Prentice Hall, 1998

Examination

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

- 80% for all homeworks.
- 60% on take-home exam

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.