



T-501-REGL **REGLUNARFRÆÐI (enska: FEEDBACK CONTROL SYSTEMS)** **6 ECTS**

Year of study: 3rd/4th year (final year BSc/first year MSc).
Semester: Fall.
Level of course: 3. First cycle, advanced / 4. Second cycle, introductory.
Type of course: Core HÁV, RAV. Recommended elective for HEV and VV.
Prerequisites (mandatory): Calculus I (T-101-STA1), Calculus II (T-201-STA2), Mathematics III (T-301-MATH), Linear Algebra (T-211-LINA), Linear Dynamic Systems. T-401-LISY. Programming in Matlab and/or Python.
Schedule: Runs for 12 weeks - 6 lectures each week, along with exercises.
Supervising teacher: Elias August.
Lecturer: Elias August.

Learning outcome: This course is designed to give you a solid foundation in the theory and concepts of dynamic systems and how models are used for determining system behaviour. The design of feed-back control systems is particularly well suited to achieving this objective, as it calls for an in-depth understanding of system stability and how this is affected by the design of control signals.

Having completed this course, you should be able to

- explain structure and characteristics of automatic control systems
- develop mathematical models of common control systems using differential equations
- calibrate these models using system response measurements
- determine system stability
- apply control to satisfy operational requirements and achieve satisfactory performance
- use common methods and software (MATLAB) for the design of control systems
- actively participate in the design of a control system
- undertake further studies in the analysis and design of complex control systems

Content: This is an introductory course to feedback control systems. The course topics are:

- Models of dynamical systems based on ordinary differential equations
- Stability analysis
- Linear systems
- Design of control systems in state-space
- PID control
- Frequency domain analysis
- Frequency domain design methods

Reading material:

K. J. Åström & R. M. Murray, *Feedback Systems: An Introduction for Scientists and Engineers*, Princeton University Press, 2008 (www.cds.caltech.edu/~murray/amwiki/Main_Page)

Teaching and learning activities: To be decided.

Assessment methods: To be decided.

Language of instruction: English.

Birt með fyrirvara um breytingar.

Uppfærðar upplýsingar um námsmat og kennsluáðferðir eru birtar í kennslukerfinu Canvas í upphafi hvorrar annar.