


 Faculty of Applied Sciences

ELEC1510 Linear Automatic

[30h+37.5h exercises] 5 credits

This course is not taught in 2005-2006

This course is taught in the 2nd semester

Language: French

Level: First cycle

Aims

Basic education in linear control systems.

The objective is to learn how to design control systems from linear models through practical case-studies.

Main themes

Derivation of mathematical models of linear dynamical systems (state equations and transfer functions).

Design of regulators and closed-loop control systems in order to satisfy specifications of stability, robustness, steady-state accuracy and transient performance.

PI and PID regulation.

Computer aided design.

Content and teaching methods

1. Mathematical models
2. General principles of closed-loop control
3. Stability
4. Steady-state accuracy
5. Disturbance attenuation
6. Transient performance
7. Robustness
8. Regulation structures
9. Case studies: electrical machines, automotive systems, aeronautics, thermic and nuclear power plants, heat exchangers, industrial grinding and mixing processes, etc.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Methodology : problem based learning, laboratory experiments.

Evaluation : exam based on exercises.

Reference book : R.C. Dorf and R.S. Bishop, Modern control systems, Addison Wesley.