



Faculty of Applied Sciences

ELEC1510 Linear Automatic

[30h+37.5h exercises] 5 credits

This course is taught in the 2nd semester

Teacher(s): Georges Bastin
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.

Other credits in programs

FSA13BA	Troisième année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(5 credits)	
MAP22	Deuxième année du programme conduisant au grade d'ingénieur civil en mathématiques appliquées	(5 credits)	
MECA22	Deuxième année du programme conduisant au grade d'ingénieur civil mécanicien	(5 credits)	Mandatory