

# Continuous Linear Systems Control



Component

École Nationale  
Supérieure  
d'Électrotechnique  
d'Électronique  
d'Informatique  
d'Hydraulique  
et des  
Télécommunications



Semester

Printemps

## In brief

> **Ametys Code:** N6EE02C

> **Open to exchange students:** Yes

## Presentation

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### Objectives

Have of knowledge of the basics related to linear system control: modeling with block diagrams and transfer functions, time and frequency analysis, stability analysis

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### Description

#### Introduction to control systems

- Linear time invariant systems
- Modeling with block-diagrams and transfer functions
- Architectures of control systems

#### Time and frequency analysis of linear systems

- Time response related to a particular input signal
- Harmonic analysis : Bode and Nyquist plot diagrams
- Application to particular systems: 1st order, 2nd order, 3rd order

### **Performance of control systems**

- Static and dynamic error, time response, overshoot
- Stability analysis: Routh-Hurwitz algebraic criterion, Nyquist criterion, Bode and Nyquist simplified criteria
- Stability margins (gain and phase margins)

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## Pre-requisites

Laplace transform, Electrical circuits, complex numbers