

Continuous Linear Systems Control



Component

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



Semester

Printemps

In brief

> **Code:** N6EE02C

Presentation

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

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)

Pre-requisites

Laplace transform, Electrical circuits, complex numbers