

Analog electronic system architecture



ECTS
4 credits



Component
INSTITUT
NATIONAL
DES SCIENCES
APPLIQUEES
TOULOUSE



Number of
hours
54h

Presentation

Description

Programme (detailed contents):

Lecture is divided in three main parts :

* **Active filtering and modeling of noise sources:**

ü Identify sources of noise and maximize signal to noise ratio on each floor of a chain of analog signal processing.

ü Build filters from the specification to the electronic choice with the constraints and drift components.

ü Transcribe a transfer function of biquadratic filter functions and the decline in active analog filter architecture based on feedback montages (Sallen Key, Rauch, UAF, ...) or synthesis of switched capacitor filter.

ü Optimize the order of a filter based on criteria of cost, integration, stability and sensitivity.

* **Architectures for analog information transmission :**

ü In many electronic systems, such as telecommunication or measurement systems, oscillations play an essential role in the information processing. Each electronic system poses different requirements on these oscillations, depending on the type and performance level of that specific system. It is the designer's challenge to find the specifications for the desired oscillation and to implement an electronic circuit meeting these specifications. As the desired oscillations have to fulfill many requirements, the design process can become very complex. To find an optimal solution, the designer requires a design methodology that is preferably completely top-down oriented. To achieve such a methodology, it must be assured that each property of the system can be optimized independently of all other properties. Oscillators and Oscillator Systems: Classification, Analysis and Synthesis takes a systematic approach to the design of high-performance filters and oscillator systems. A fundamental classification of oscillators, based on their internal timing references, forms the basis of this approach.

* **Establish a system prototype design of programmable analog circuits such FPAA.**

Objectives

At the end of this module, the student will have understood and be able to explain (main concepts):

* Dimension and design of analog electronic functions of information processing (filtering, amplification, automatic

gain control, voltage controlled oscillators, modulators / demodulators AM and FM;

- * Optimize the signal to noise ratio in each subset of an embedded system
- * Modeling architectures for robust usage constraints (consumption, temperature to dissipate), the thermal variations of the environment and dispersions characteristics of components

Useful info

Place

› Toulouse