

Mechatronic systems modeling

Number of ECTS credits: 3
Coefficient: 3

Description:

This constitutive element is for the modeling and behavior simulation of mechatronic systems through the following aspects:

- 1) behaviors laws, energy and classification of components,
- 2) interconnections in components networks (directed linear graphs),
- 3) Kirchoff laws and Tellegen theorem,
- 4) Algebraic formulation of directed linear graphs,
- 5) resolution techniques,
- 6) state-space representation and numerical somulation.

The labs are carried out with various mechatronic systems (thermal, DC motors, ...) as well as with the Matlab- Simulink software

Pedagogical objectives:

The student will be able:

- to classify and to identify the global energy exchange in given mechatronic components and in networks of mechatronic components,
- to model and simulate numerically the behavior of mechatronic components and of networks of mechatronic components by using linear graphs and linear algebra techniques.

Bibliography: Prerequisite:

Linear algebra, ordinary differential equations

Lectures Hours: 15

Tutorials Hours: 7

Labs Hours: 16

Knowledge monitoring modalities: 100% continuous assesement

Assesement: The continous assessments marks will be composed of at least the labs markings. The final exam mark is from the markings of the exam at the end of this constitutive element MSM 1.

Leader: Cédric CLEVY

Participants: