

Energy management for embedded systems



ECTS
3 crédits



Hourly volume

Introducing

Objectives

- At the end of this module, the student will have understood and be able to explain (main concepts):
- The characteristics of the energy sources that can be used on embedded systems,
- The characteristics of quantities in electrical distribution networks
- Power converter architectures,
- The modeling of an electric motor/generator based on its coupled electrical and mechanical values.
- The operation of a transformer and its model.
- The structures and main characteristics of single-phase and three-phase AC-DC converters.
- The main chopper structures, their properties, reversibilities and their control.
- The principle of torque and/or speed regulation of a DC machine using a chopper.

The student should be able to:

- Analyze the energy needs of an on-board system and propose and size a solution,
- Use coupled electrical and mechanical equations to model an electro-mechanical system
- Analyze a mechanical system and identify the drive requirements, the type of converter that must be associated with the machine.
- Dimension the elements of an electrical energy conversion chain which allows to drive a given actuator.

Necessary prerequisites

General knowledge of electricity, alternating current, electrical circuits, analog and digital electronics as well as mathematical tools (Fourier and Laplace transforms) and the basics of automatic control (transfer functions and block diagrams)

Practical info

Location(s)

 Toulouse