UE Modeling and Methods for Electrical Circuits and Systems

ECTS
3 credits

Component
UFR PhITEM (physique, ingénierie, terre, environnement, mécanique)

Semester
Automne

Teaching language(s): English

Open to exchange students: Yes

Presentation

Description

This UE consists of two parts. One deals with modeling and simulation of electrical circuits, while the second covers approaches to system simulation.

- Numerical simulation methods of electrical circuits: generic techniques for setting equation of electrical circuits, graph theory, numerical method for solving linear and nonlinear systems, iterative methods, solving differential equations.
- System simulation and Artificial Intelligence

Assessment: The grading policy comprises homework and lab assessments plus a final examination. The grade of the module is the weighted average of the marks of each assessment.

Course parts

CM	Lectures (CM)	6h
TP	Practical work (TP)	14h

Recommended prerequisites

For this course, the students will benefit of a successful completion of mathematical foundations of electric circuits.

Bibliography

- Introduction to graph theory, Richard J. Trudeau, Dover Pub, 1993.
- Differential-algebraic equations. Analysis and numerical solution, Kunkel Peter, Mehrmann Volker, Zürich: European Mathematical Society Publishing House, 2006.
- Ascher, L. Petzold, Computer Methods for Ordinary Differential Equations and Differential-Algebraic Equations, SIAM, Philadelphia, 1998.

Useful info

Campus

Grenoble - Scientific Polygon