

# Solving PDEs using finite differences



## Component

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

## In brief

- > **Amety's Code:** ELP4
- > **Open to exchange students:** Yes

## Presentation

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### Objectives

At the end of this course, students will have learned the basics of solving partial differential equations using the finite difference method.

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### Description

In this course, students will study: - Elliptic Equations Discretization and solving of the equation in 1D. Study of consistency, stability, and convergence in 1D. - Parabolic Equations Discretization and solving, stability, consistency, and convergence. Explicit, implicit, Richardson, and Crank-Nicolson schemes. - Introduction to Hyperbolic Equations Presentation of a discretization and some of its properties. Examples will be drawn from the EEEA department (PN junction, electromagnetism, etc.).