

System optimization and optimal design



Component

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

In brief

- > **AmetyS Code:** N8EE21A
- > **Open to exchange students:** Yes

Presentation

Objectives

- By the end of this course, students will have learned how to formulate a constrained optimization problem with a view to solving it.
 - They will be able to describe the problem in terms of an objective function under constraints and use numerical tools to solve it optimally.
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Description

- Illustration of design problems formalized as optimization problems with constraints.
- Review of unconstrained optimization: mathematical theorems and gradient algorithms, optimal step gradient, Newton and quasi-Newton.
- Optimization with constraints on variables: first simple projection algorithm.
- Mathematical formalization of optimization problems with constraints.
- Presentation of Penalty Methods

- Definition of the Lagrange Function
- KKT Theorem (Karush-Khun-Tucker)
- Uzawa Algorithm, Active-set, SQP, Interior Point Algorithm