Optimization of structures

ECTS credits
1 credits

Semester
Fall

In brief

Course langage: French

Presentation

Learning objectives

- Acquire the theoretical bases necessary for the formulation of an optimization problem in structural mechanics
- Know and know how to implement the main classes of design problems
  -- through simple and academic examples;
  -- through a number of industrial applications by learning a professional optimization software (OptiStruct).
- Discover the methods being developed in the field of optimization

Description of the programme

- Issues in structure optimization
- The main classes of problems
- Introduction to the basic theoretical notions of differentiable optimization in finite dimension and to the algorithmic principles of numerical optimization
- Introduction to optimal control
- Parametric optimization
- Geometric optimization
- Topological optimization (SIMP, homogenization, penalization)
- Handling and parameterization of an industrial code (OptiStruct)
- Other methods (level lines, genetic algorithms...) and new trends

Generic central skills and knowledge targeted in the discipline

- Know how to formulate an optimization problem

- Know how to choose and implement the appropriate algorithm
- Know how to use and parameterize a calculation software for an optimization
- Know how to analyze and criticize the results of the calculation

How knowledge is tested

- CC1: MCQ (33%)
- CC2: Report on FreeFEM practical work (33%)
- CC3: Report on OptiStruct practical work (34%)

Bibliography

Course materials in PDF

Teaching team

Jean-Marie Rossi

Sustainable Development Goal



Responsible consumption and production

Total des heures		**24h**
CM	Master class	16h
TP	Practical work	8h

Useful info

Name responsible for EU

Lead Instructor

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