

# Finite elements design



ECTS  
4 crédits



Hourly volume  
38h

## Introducing

### Objectives

At the end of this module, the student should have understood and be able to explain (main concepts): the fundamentals of the finite element method applied to the design of structures in the field of linear elasticity.

The student should be able to:

- build and assemble elementary operators for certain types of simple elements (bars, beams, plane elasticity)
- analyze the behaviour of a simple mechanical part subjected to static using an industrial FE software.
- propose a model of a real problem by choosing a small but sufficient number of suitable elements and apply representative boundary conditions.
- take the usual precautions to obtain reliable results.
- critically analyze the quality of the solution with respect to the numerical phenomena that can alter it.

### Necessary prerequisites

Rigid body mechanics (statics)

Continuum Mechanics (stress, strain, constitutive relation, boundary conditions)

Beam theory

## Practical info

### Location(s)

Toulouse