

# Material behavior - Plasticity



ECTS credits  
2 credits



Semester  
Fall

## In brief

➤ **Course language:** French

## Presentation

### Prerequisites

Continuum mechanics, algebra and tensor analysis (1st year [Mechanics](#) course)

### Learning objectives

Going beyond the framework of linear elasticity under the assumption of small perturbations:

- Discover the main types of nonlinear behavior of materials
- Know the thermodynamic framework in which the general models must fit
- Master several behavior models

### Description of the programme

- Demonstration on simple tensile tests
- Thermodynamics of irreversible processes as a framework for writing behavior models
- Three examples of elasto-(visco)-plasticity models
- An example of an elasticity-damage model

### Generic central skills and knowledge targeted in the discipline

- Know how to identify the appropriate behavioral model for the problem at hand

- Model complex problems with advanced behavioral models
- Propose behavior models adapted to new materials

---

## How knowledge is tested

DS: written evaluation, 2h (100%)

---

## Bibliography

- J. Lemaître et J.-L. Chaboche, Mécanique des matériaux solides, 2004
- D. François, A. Pineau et A. Zaoui, Élasticité et plasticité, 2009

---

## Teaching team

Thierry Désoyer

Total des heures		24h
CM	Master class	14h
TD	Directed work	8h
TP	Practical work	2h

---

## Useful info

---

### Name responsible for EU

#### Lead Instructor

Thierry Desoyer

✉ [thierry.desoyer@centrale-med.fr](mailto:thierry.desoyer@centrale-med.fr)