

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