

Materials mechanical properties

Course code: AMM3

ECTS Credits: 2.5

Department	: MSISI	Lectures	: 15h00
Lecturers	: J.Cormier	Tutorials	: 15h00
Year of study	: 2 nd year	Laboratory sessions	:
Semester	: 3 rd semester	Project	:
Assessment method(s)	: 1 written test	Home works	:
Language of instruction	: English	Total hours	: 30h00
Type of courses	: Compulsory		

Objective: Connect the macroscopic and microscopic aspects of metals and metal alloys mechanical properties.

Prerequisites: Materials science

Content:

1. Materials elasticity behavior

- Isotropic and anisotropic materials
- Elasticity constants
- Measurement techniques

2. Anelastic behavior

- Anelasticity (creep, absorption, relaxation, damping)
- Linear and non linear models (Rheology)
- Physical origin of anelasticity, Applications

3. Plastic behavior

- Plastic deformation of solids
- Stress-deformation relations on micro and macroscopic scales
- Crystalline defects

Recommended reading:

Physique des Matériaux, Quéré, Eds. Ellipses.

Dislocations et Plasticité des Cristaux, Martin, Presses Polytechniques et Universitaires Romandes

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