



Faculty of Applied Sciences

MAPR2482 Plasticity and metal forming

[30h+22.5h exercises] 4 credits

This two-yearly course is taught in 2006-2007, 2008-2009,...

This course is taught in the 2nd semester

Teacher(s): Thomas Pardoën
Language: French
Level: Second cycle

Aims

The course covers the various concepts or theory related to the forming of metals: macroscopic theory of plasticity, mechanisms of microstructure evolution, cristallographic textures, residual stresses, tribology, forming limits. It also introduces to the key technological issues involved in the most common metal forming processes.

Main themes

1. Plasticity theory
 - Phenomenological isotropic deformation and flow theory
 - Phenomenological anisotropic theory
 - Introduction to crystal plasticity
2. Cristallographic textures and deformation textures
3. Localization and fracture during metal forming
 - Localisation mechanisms
 - Fracture mechanisms
 - Forming limit diagrams
4. Residual stresses in metal forming
5. Microstructure evolution : recristallisation, recovery, precipitation
6. Introduction to contact mechanics and wear
7. Technological aspects of metal forming operations (extrusion, deep-drawing, rolling, drawing)

Content and teaching methods

Introduction to the mechanical, metallurgical and technological aspects involved in the forming of metallic materials.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Nil

Other credits in programs

MATR22	Deuxième année du programme conduisant au grade d'ingénieur civil en science des matériaux	(4 credits)
MATR23	Troisième année du programme conduisant au grade d'ingénieur civil en science des matériaux	(4 credits)
MECA22	Deuxième année du programme conduisant au grade d'ingénieur civil mécanicien	(4 credits)
MECA23	Troisième année du programme conduisant au grade d'ingénieur civil mécanicien	(4 credits)