


 Faculty of Applied Sciences

MAPR2420 Complements of physical metallurgy

[30h+22.5h exercises] 4 credits

This two-yearly course is taught in 2007-2008, 2009-2010,...

This course is taught in the 2nd semester

Teacher(s): Francis Delannay, Pascal Jacques (coord.), Thomas Pardoen
Language: French
Level: Second cycle

Aims

Complement to the formation given in the course MAPR 2473 Metallurgical physical-chemistry. At the end of this course, the student should be able to read on an autonomous way the whole literature in the domain of physical metallurgy.

Main themes

Nil

Content and teaching methods

- Solutions and intermetallic compounds : rules of Hume-Rothery ; order-disorder transformations
- Magnetic materials : ferromagnetism ; permanent magnets, soft magnetic materials
- Rapid solidification, metallic glasses and quasi-crystals
- Superconductors
- Steels : reminder of basic notions, mechanical properties, phase transformations, quenchability, tempering, reheating and surface treatments, thermomechanical treatments
- Non-ferrous alloys : light alloys : Al, Mg, Ti, Cu and Cu-alloys. Low melting point alloys, high temperature alloys, superalloys
- Selection of materials : criteria and performances.

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

TP : Mini-project proposed by industry and carried-out in groups of students.