



Faculté des sciences appliquées

FSA**MAPR2420 Complements of physical metallurgy**

[30h+22.5h exercises] 4 credits

This two-yearly course is taught in 2005-2006, 2007-2008,...

This course is taught in the 2nd semester

Teacher(s): Francis Delannay (coord.), Pascal Jacques
Language: french
Level: 2nd cycle course

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.

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.