MSE-483

Advanced phase transformations

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Cursus	Sem.	Type
Materials Science and Engineering	MA1, MA3	Opt.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	Oral
Workload	90h
Weeks	14
Hours	**3 weekly**
Courses	2 weekly
Exercises	1 weekly
Number of positions	

Summary

This course provides an overview of the phenomenological concepts and mathematical tools that have been developed to study the thermodynamics, kinetics and mechanics of phase transformations.

Content

- Review of the mathematical structure of thermodynamics and kinetics
- Thermodynamics of first-order and second-order phase transitions
- Order parameters for phase transformations
- Thermodynamic descriptions of inhomogeneous systems
- Kinetics of phase transformations
- Mechanics of phase transformations

Learning Prerequisites

Required courses

Basic courses in thermodynamics, phase transformations, physics and mathematics

Learning Outcomes

- Analyze the thermodynamics and kinetics of phase transformations

Teaching methods

Ex cathedra and exercises

Assessment methods

Oral examination

Resources

Bibliography

- Theory of Structural Transformations in Solids, Khachaturyan, Dover.

- Kinetics of Materials, Balluffi, Allen, Carter, Wiley 2005
- Phase Transformations in Metals and Alloys, Porter and Easterling

Ressources en bibliothèque

- Find the references at the Library