



UNIVERSITY of MISKOLC
Faculty of Materials Science and Engineering
Antal Kerpely Doctoral School of Materials
Science & Technology



Solid state transformations

Dr. Márton Benke

COURSE DESCRIPTION

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MAHDFH4EN

Lecturer

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Recommendation

The lecture is proposed for all students of the Kerpely doctoral school, especially in the field of metalforming, physical metallurgy, heat treatment and casting.

Language

English.

Scope

The objective of the course is to categorize and teach the principles of solid state transformations occurring in metallic materials.

Methodology

The course is held in contact lectures. The time of contact courses is based on agreements with the students.

Topics

Nucleation in solid state
Homogenizing, ordering, GP zone formation, the AVRAMI equation
Recrystallization, nucleation, grain growth, TTT diagrams
Precipitation, GP zones, formation of metastable and stable phases
Redissolution
Allotropic transformations in pure metals and solid solutions
Eutectic transformation
Massive transformation
Bainitic transformation
Martensitic transformation

References

1. Verhooven J.D.: Fundamentals of physical metallurgy. John Wilen and Sons, 1975
2. Haasen P.: Phase transformation in materials. Mat. Sci. Techn. Vol. 5. VCH. 1991

Exam

Oral exam if basic questions are answered correctly.

Complex exam questions

1. Homogeneous transformations
2. Phase transformations with long range diffusion
3. Phase transformations with short range diffusion
4. Diffusionless phase transformations