

t.MVBT - Metalle und Verbindungstechnik

Person responsible for the course: Arnd Jung, jung
Credits: 3
Valid for: 2010/2011
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Learning objectives:

- Understanding of the microstructure of metals
 - Understanding of the relation between microstructure and properties of materials
 - Knowing selection criteria for appropriate joining technique
 - Knowing the advantages and disadvantages of the different procedures
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Course content:

- Microstructure of the different classes of metals
- Steels
- Aluminium and titanium alloys
- Nickel and cobalt alloys
- Heat treatments and microstructure transformation

Welding:

- Welding techniques: arc welding, submerged welding, laser- and electric beam welding, inert gas welding (TIG, MIG, MAG)
- Influence of welding on material properties (microstructure, mechanical properties, residual stresses)
- Weldability
- Strength and design of welded joints
- Case studies

Soldering:

- Soldering and brazing processes, including high temperature brazing
 - surfaces treatments
 - Influence of brazing on the strength of joints
 - Case studies
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Previous knowledge:

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Teaching method:

Type of lesson:	Number of lessons per week:
Lecture	14x2L
Tutorial/Practicum	14x1L
Group teaching	
Block instruction	
Seminar	

Assessment:

According to the table or as specified in writing by the lecture at the beginning of the semester!

Number	Type	Weighting
1	End of term exam	100%
	Exam during the semester	
	Further assessments	

Language of instruction:

Deutsch

Instruction material:

- lecture notes
 - E. Roos, K. Maile, Werkstoffkunde für Ingenieure ? Grundlagen, Anwendung, Prüfung, Springer-Verlag, 2. Auflage, 2005, ISBN 3-540-22034-8
 - W. Bergmann, Werkstofftechnik 1 + 2, Hanser-Verlag, ISBN 3-446-21409-7 (Bd. 1), ISBN 3-446- 21639-1 (Bd. 2)
 - U. Diltthey, Schweisstechnische Fertigungsverfahren 1 + 2, Springer-Verlag, ISBN 3-540-21673-1 (Bd. 1), ISBN 3-540-21674-X (Bd. 2)
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Comments:

excursion