Advanced Aspects of Metallic Materials

Lecturer: Dr.-Ing. Peter Starke (Saarland University, Germany)

Course description:

The range of metallic materials covers most of the Periodic Table, with a wide range of engineering alloys, such as irons and steels, alloys of aluminium and magnesium, titanium, nickel and zinc alloys, and copper alloys. This course will explain their micro- and meso-structure and the related properties in the unloaded condition and their changes due to static, quasi-static as well as fatigue loading under different environmental conditions.

The elastic and elastic-plastic material behavior as well as the damage evolution up to failure will be characterized and evaluated by means of micro-structure-based parameters based on mechanics, electronics and magnetics. This course also includes the selection, design, processing and modification of these materials for different structural applications.

Syllabus of the lecture

1. Functional metallic materials: structure, properties and application
2. Advanced technologies of the metallic materials production
3. Thermal and thermomechanical treatment of special steels and alloys
4. Deformation behaviour of metallic materials
5. Materials testing
6. Statistic determination of material data
7. Fatigue and fracture
8. Specimen testing vs. component testing
9. Fatigue life calculation and phenomenological approaches

   ➔application examples for the physically based fatigue life calculation method “PHYBAL“

TERMINY WYKLADÓW			
Data	**Dzień tygodnia**	**Godzina**	**Sala**
2015-01-19	Pn	12.15-17.00	EiA E28
2015-01-20	Wt	12.15-17.00	EiA E28
2015-01-21	Śr	12.15-17.00	EiA E28

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