t.KMA - Keramische Materialien

Person responsible for the course:	Dirk Penner, penr
Credits:	3
Valid for:	2010/2011
Last saved:	12.07.2010 10:28

Learning objectives:

The students

- recognize the importance of ceramics in the field of materials today

- know standard and technical ceramics

- know the relation between structures and properties

- know and understand ceramic composite materials

- know the deformation of ceramic materials at high temperatures

- know properties, applications and manufacturing processes

- know the possibilities of ceramics as engineering materials

- obtain an insight into the current research on ceramics

Course content:

Introduction, definitions of ceramics

Silicate ceramics, oxide ceramics, non oxide ceramics, glass, glass ceramics

Synthetic and natural raw materials, powders, confection

Grain size analysis, density, BET

Shaping - casting, pressing, extrusion

Rheology, colloid stability, additives

Special processes - tape casting, freeze casting, injection moulding, gel casting, pressure casting, printing, infiltration

Sintering, thermal processes, thermal analysis

Structure analysis - XRD, SEM, EDX, TEM, IR

Finishing, decoration, coating, system integration

Fracture mechanics

High temperature properties

Construction, joining

Applications (Bioceramics --> course Biomaterials), functional ceramics, structure ceramics, porous ceramics, refractories

Silicate ceramics, ZrO2, SiC, Si3N4, Al2O3, Pb(Zr/Ti)O3, CMC's, SOFC

Previous knowledge:

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Teaching method:

Type of lesson:	Number of lessons per week:
Lecture	14x2L
Tutorial/Practicum	5x3L
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	
	Exam during the semester	
	Further assessments	

Language of instruction:

Deutsch

Instruction material:

Vorlesungsfolien

3540632735 Keramik Salmang, Scholze, Telle Springer 7 2006

3-8027-2927-7 Technische Keramik Kollenberg Vulkan 1 2004

Comments:

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