



## COURSE DATASHEET

<b>Semester:</b>	2014/15/1
<b>Course:</b>	Solid State Chemistry IV.
<b>Code:</b>	VEMKSIB142T
<b>Responsible department:</b>	Institute of Materials Engineering
<b>Department code:</b>	MKSI
<b>Responsible instructor:</b>	dr. Margit Eniszné Bódogh

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### Course objectives:

Introduction the structure, physical and chemical properties of the glasses

### Course content:

Undercooled liquids, characterization of noncrystalline (glassy) solids Freezing of melt to a vitreous solid Theories of glass structure Phase separation, immiscibility in glasses, Thermodynamic of phase separation Crystallization, nucleation, crystal growth, controlled crystallization Kinetics of crystallization Glass-ceramics Characterization and experimental investigations of physical properties of glasses, correlation between the physical properties and chemical composition of glasses Measurement of viscosity, thermal expansion, heat and electrical conductivity, density, surface tension, dependence of viscosity and surface tension on chemical composition and temperature Characterization of mechanical properties (strength, hardness, strains) of glasses, strengthening methods Dependence of chemical resistance on the chemical composition and temperature Optical properties

### Requirements, evaluation and grading:

Mandatory attendance of the lectures, the solution of a midterm test with a score of 2 or above, grading is based on a written examination

### Required and recommended readings:

Vogel, W.: Glaschemie, Springer-Verlag Berlin, 1992 Scholze, H.: Glas, Springer-Verlag Berlin, 1988 Simmons, J.H., Uhlmann, D.R., Beall, G.H.: Nucleation and Crystallization in Glasses, The American Ceramic Society, Columbus, Ohio, 1982 Rawson, H.: Properties and Application of Glass, Elsevier Sci. Publ. Comp. Amsterdam, 1980 Doremus, R.H.: Glass Science, John Wiley and Sons, New York, 1973 Zarzycki, J.: Glasses and the Vitreous State, Cambridge Univ. Press, Cambridge, 1991