

## Information sheet for the course Colloid and Surface Chemistry

<b>University:</b> <i>Alexander Dubček University of Trenčín</i>	
<b>Faculty:</b> <i>VILA – Joint Glass Centre</i>	
<b>Course unit code:</b> <i>CSCH</i>	<b>Course unit title:</b> <i>Colloid and Surface Chemistry</i>
<b>Type of course unit:</b> <i>compulsory</i>	
<b>Planned types, learning activities and teaching methods:</b> <i>Lecture: 2 hours weekly face to face</i>	
<b>Number of credits:</b> <i>3</i>	
<b>Recommended semester:</b> <i>2. semester in the 1<sup>st</sup> year (full-time)</i>	
<b>Degree of study:</b> <i>II. (engineer, magister)</i>	
<b>Course prerequisites:</b> <i>none</i>	
<b>Assesment methods:</b> <i>A requirement to complete the subject is the successful passing the examination. The examination is in the form of test that consists of 20 questions (in total 100 points). Gradings: Final letter grades will be assigned according to the following total points earned: A 95-100 points, B 90-95 points, C 80-90 points, D 70-80 points, E at least 60 points.</i>	
<b>Learning outcomes of the course unit:</b> <i>A student will receive the integral set of basic knowledge in the field of colloid and surface chemistry. The student will be able to understand the principles of physico-chemical phenomena, relations between structure and properties in the field of colloid and surface chemistry, and to apply the received knowledge in modern technology, nanotechnology and environmental protection.</i>	
<b>Course contents:</b> <ol style="list-style-type: none"> <li>1. <i>Introduction to colloid and surface chemistry. Basic definitions and terms used in colloid and surface chemistry.</i></li> <li>2. <i>Surface phenomena and the structure of the interface.</i></li> <li>3. <i>Adsorption at the liquidus-gaseus interfaces. Adsorption isotherms.</i></li> <li>4. <i>Surface active and inactive agents. Adsorption at the solid interfaces. Adsorption at the condensed interfaces.</i></li> <li>5. <i>Molecular and kinetics properties of dispersions – Brownian motion, diffusion.</i></li> <li>6. <i>Sedimentation in dispersion systems and sedimentation methods in analysis of dispersions.</i></li> <li>7. <i>Sedimentation-diffusion equilibrium in dispersion systems.</i></li> <li>8. <i>Thermodynamics of solutions, osmotic pressure and the theory of membrane equilibrium.</i></li> <li>9. <i>Rheological properties of dispersion systems – viscosity.</i></li> <li>10. <i>Optical properties of dispersion systems – light scattering.</i></li> <li>11. <i>Electrical properties of dispersion systems – electrical double layer, electrokinetics phenomena, electrocapillary phenomena.</i></li> <li>12. <i>Lyophilic colloidal systems. Lyophobic colloidal systems.</i></li> <li>13. <i>Gels.</i></li> <li>14. <i>Chemical functionalization of surfaces – importance and applications.</i></li> </ol>	
<b>Recommended of required reading:</b> <i>E.D.Ščukin, A.V.Percov, E.A.Amelinová: Koloidní chemie, Academia, Praha 1990.</i> <i>L. Bartovská, M. Šišková, Fyzikální chemie povrchů a koloidních soustav, 5. vydání VŠCHT Praha, 2005.</i> <i>J. Pouchlý, Fyzikální chemie makromolekulárních a koloidních soustav, 3. vydání, VŠCHT Praha, 2008.</i>	

*P.W. Atkins: Fyzikálna Chémia, STU Bratislava, 1999.*

*P.C. Hiemenz, R. Rajagopalan: Principles of Colloid and Surface Chemistry. 3rd Ed., Marcel Dekker, Inc., New York, 1997.*

**Language:** *Slovak*

**Remarks:** *none*

**Evaluation history:**

A	B	C	D	E	FX

**Lecturer:** *Ing. Róbert Klement, PhD.*

**Last modification:** *31. 1. 2014*

**Supervisor:** *prof. Ing. Marek Liška, DrSc.*