

### Course datasheet

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| <b>Name of course group:</b>                | Catalysis, Colloid and interface science (MK-PR5)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Course name:</b>                         | <b>Interfacial thermodynamics and colloidal processes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Course name in Hungarian:                   | Határfelületek szerkezete és termodinamikája; kolloid állapotváltozások                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Course name in English:                     | Interfacial thermodynamics and colloidal processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Organization unit (responsible department): | Faculty of Science and Informatics, University of Szeged<br>Institute of Chemistry, Doctoral School of Chemistry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Course Code                                 | KDIT-128                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Course responsible:                         | Tamas Szabo, PhD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Preliminary requirements:                   | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Course announcement time                    | Spring semester – II. semester                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Suggested registration time:                | 2. semester                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Weekly hours:                               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Total hours:                                | 28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Credit number:                              | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Course evaluation (completion outcome):     | 5-grade mark                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Maximum number of course registrations:     | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Department announcing the course:           | Institute of Chemistry, Doctoral School of Chemistry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Type of course                              | Theoretical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Lecturer(s):                                | Oral                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| A kurzus oktatói:                           | Tamas Szabo, PhD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| *Topics:                                    | <ul style="list-style-type: none"> <li>- Basic thermodynamic quantities and relations specifically applied on interfaces.</li> <li>- The structure of the interfacial layer and its thermodynamical excess quantities.</li> <li>- Casting insoluble monolayers; the structure of Langmuir-Blodgett films.</li> <li>- Interfacial equilibria at the solid/liquid interface, surface charge formation (permanent and conditional) and their charge compensation propensities.</li> <li>- Synthesis of nanocomposites by heteroaggregation processes.</li> <li>- Interfacial chemistry of carbon nanostructures.</li> </ul> |

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|                        | - Collodial processes of in aqueous electrolyte solutions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| *Suggested literature: | <p>1- R.J. Hunter: Foundations of Colloid Science, Vol. I., II., Clarendon Press, Oxford, 1989.</p> <p>2- J. Lyklema: Fundamentals of Interface and Colloid Science, Vol. I: Fundamentals, Academic Press, London, 1991., Vol.II: Solid-Liquid Interfaces, 1995.</p> <p>3- G. Sposito: Characterization of particle surface charge, Ch. 7. in Environmental Particles Vol.1. (Eds. J.Buffle, H.P.van Leeuwen), Lewis Publishers, Boca Raton, 1992. pp. 291-314.</p> <p>4- Th.F.Tadros (Ed.): Solid/Liquid Dispersions, Academic Press, London, 1978.</p> <p>5- J.N. Israelachvili: Intermolecular and Surface Forces, Academic Press, London, 1985.</p> <p>6- M.Elimelech, J.Gregory, X.Jia, R.Williams: Particle Deposition &amp; Aggregation, Measurement, Modelling and Simulation, Butterworth-Heinemann Ltd., Oxford, 1995.</p> <p>7- John C Berg: An Introduction to Interfaces and Colloids - The Bridge to Nanoscience, World Scientific Book, New York, 2009.</p> |