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| 1. Course title: Physical Chem. III. lect. | | | | | |
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| 2. Code: | | 3. Type (lecture, practice etc.): lecture | | | |
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| 4. Contact hours: 2 hoursper week | | 5. Number of credits (ECTS): 3 | | | |
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| 6. Preliminary conditions (max. 3):  Physical Chemistry II. lect. | | | | | |
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| 7. Announced:fall semester, spring semester, both | | | | | |
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| 8. Limit for participants: - | | | | | |
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| 10. Responsible teacher (faculty, institute and department):  Sándor Kunsági-Máté, PhD (Faculty of Science, Institute of Chemistry, Department of General and Physical Chemistry) | | | | | |
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| 11. Teacher(s) and percentage: | | Dr. Sándor Kunsági-Máté | | 80 % | |
| Dr. Beáta Lemli | | 20 % | |
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| 12. Language:English | | | | | |
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| 13. Course objectives and/or learning outcomes: The scope is to understand the basic rules of electrochemistry, material structure backgrounds necessary for evaluation of experimental results, also improving modeling ability of students according to the structure of materials. | | | | | |
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| 14. Course outline   1. Rotation and vibration spectra of multi atomic molecules (determination of bond length, force constant, dissociation energy from the spectra) 2. Normal modes of vibrations, characteristic frequencies. The IR and Raman spectra. 3. UV and visible spectra (its origin, experimental spectroscopy, absorption spectrophotometry) 4. Electron spectroscopy, Mösbauer-spectroscopy. 5. Relaxations of electronically excited state. Fluorescence, phosphorescence, lasers. 6. Diffraction methods of structure investigation (x-ray-, electron-, neutron diffraction methods) 7. Electric and magnetic properties of molecules, methods for studying them, (dipole moment, polarization, optical activity, refractive index) Magnetic properties. 8. Carbon nanostructures and their fundamental interactions. 9. Weak molecular interactions, properties and investigation methods, their role in the structures of solvents. 10. Interactions in solvent mixtures. Structure of ionic liquids and liquid crystals. Structure transitions, relationship between the structures and macroscopic properties. 11. Host-guest interactions, hydrophobic and solvation effects. The role of solvents in the interactions, microsolvatation. 12. Conformations changes of proteins. Fluorimetric and calorimetric methods of investigations. 13. Interaction of mycotoxins and antibiotics with serum albumins. | | | | | |
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| 15. Mid-semester works  Attending lectures is highly recommended. | | | | | |
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| 16. Course requirements and grading  Oral exam starts with a short test. Solving it the student proves that she/he could learn the basic definitions, equations, laws, and has the necessary problem solving expertise. After successful test the student draws two question leaflets with topics about the text. After a short preparation the exam starts with a short presentation using chalk for drawing and derivations. The student also answers questions raised during the exam. | | | | | |
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| 17. List of readings   1. Peter Atkins, Julio de Paula: Physical Chemistry, W. H. Freeman and Company, New York, 2010. | | | | | |
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| 18. Recommended texts, further readings   1. Peter Atkins, Julio de Paula: Physical Chemistry, W. H. Freeman and Company, New York, 2010. | | | | | |
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| **Date** | 13 April, 2017 | **Prepared by** |  | | |
| Sándor KUNSÁGI-MÁTÉ, PhD  responsible lecturer | | |
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| **Endorsed by** | | |  | | |
| Dr. László Kollár, DSc program supervisor | | |