


| | | | | | | |
|---|---|--|---|---|-----------------------------|----------------------|
|  | UNIVERSITY OF EAST SARAJEVO Faculty of Technology Zvornik | |  | | | |
| | Study programme: Chemical Engineering and Technology | | | | | |
| | Cycle I | Year III | | | | |
| Course title | Physical Chemistry 2 | | | | | |
| Department | Department for Physical Chemistry, Electrochemical engineering and materials– Faculty of Technology Zvornik | | | | | |
| Course code | Course status | Semester | ECTS | | | |
| 04-1-025-5 | Compulsory | V | 7 | | | |
| Teacher | Dragan Tošković, PhD, full professor | | | | | |
| Teaching assistant | Danijela Rajić, MSc, senior assistant | | | | | |
| Number of classes/ teaching workload (per week) | | Individual student workload (in hours per semester) | | Student workload coefficient S₀ | | |
| Lectures | Auditory exercises | Laboratory exercises | Lectures | Auditory exercises | Laboratory exercises | S₀ |
| 3 | 1 | 2 | 45 | 15 | 30 | 1.33 |
| 3*15+1*15+2*15=90 hours | | | (3*15*1.33+1*15*1.33+2*15*1.33)=120 hours | | | |
| Total course workload 90 + 120=210hours per semester | | | | | | |
| Learning outcomes | After finishing the course, students will be able to: <ol style="list-style-type: none"> 1. use the kinetic theory of the equation of state on different models; 2. calculate heat capacities in systems based on tabular or experimentally obtained data; 3. experimentally determine the order of the reaction and, based on the obtained solution, calculate the amounts of participants in the reaction at any moment of its development; 4. determine coefficients of thermal conductivity, viscosity and diffusion based on experimentally obtained data and use the results in the description of industrial systems; 5. use Faraday's laws on specific examples; 6. experimentally use the obtained data in order to form coatings or metal powders. | | | | | |
| Prerequisites | | | | | | |
| Teaching methods | Lectures, auditory and laboratory exercises, mid-term tests (colloquia). | | | | | |
| Syllabus outline per week | <ol style="list-style-type: none"> 1. Introduction to chemical dynamics. Kinetic gas theory. 2. Transfer processes, transfer flow, viscosity, diffusion. 3. Chemical kinetics, basic kinetic concepts. 4. Irreversible chemical reactions. Simultaneous reactions. 5. Dependence of reaction speed on temperature. Theory of reaction speed. 6. Reactions in the gas phase. Reactions in solutions. 7. Heterogeneous reactions, diffusion control of heterogeneous processes. 8. Catalysis. Catalytic reactions, homogeneous reactions, heterogeneous reactions. 9. Kinetics of biochemical reactions. 10. Electrochemistry and electrochemical systems. 11. Interaction of ions in electrolyte solutions. 12. Basics of electrochemical thermodynamics. 13. Basic model of the double electric layer structure. 14. Kinetics of electrochemical oxidation and reduction reactions. 15. Electrode potential and electromotive forces of galvanic couplings. <p style="text-align: center;">Mid-term tests are taken after the 8th week and the 15th week. Semester verification is required after the 15th week.</p> | | | | | |
| Obligatory reading | | | | | | |

| Author | Title, publisher | Year | Pages | |
|---|---|------|--------------|------------|
| Tošković, D. | Physical Chemistry, Faculty of Technology Zvornik | 1999 | 208-567 | |
| Additional reading | | | | |
| Author | Title, publisher | Year | Pages | |
| Holclajtner-Antrunović, I. | General course of Physical Chemistry | 2012 | 158-250 | |
| Đorđević, S., Dražić, V. | Physical Chemistry, Faculty of Technology and metallurgy Belgrade | 2002 | 1-370 | |
| Dondur, V. | Chemical kinetics, Faculty of Sciences Belgrade | 2012 | 95-120 | |
| Atkins, P.W., De Paula, J. | Physical Chemistry, 9 th Edition, W.H. Freeman & Co., New York | 2002 | 1-300 | |
| Tošković, D., Aleksić, V. | Collection of exercises in Physical Chemistry, Faculty of Technology Zvornik | 2002 | 203-300 | |
| Tošković, D., Vasiljević, Lj., Lazić, D. | Experimental Physical Chemistry, Faculty of Technology Zvornik | 2005 | 99-215 | |
| Korać, F., Gutić, S., Gojak, S., Ostojić, J., Islamović, S. | Practical course in physical chemistry I and II, Technological Faculty of Tuzla | 2013 | 1-90 | |
| Obligations, assessment methods and grading system | Type of student evaluation | | Grade points | Percentage |
| | Pre-exam obligations | | | |
| | Attendance | | 6 | 6% |
| | Mid-term test (colloquium) I tasks | | 10 | 10 % |
| | Mid-term test (colloquium) I theory | | 17 | 17 % |
| | Mid-term test (colloquium) II tasks | | 10 | 10 % |
| | Mid-term test (colloquium) II theory | | 17 | 17% |
| | Laboratory exercises | | 10 | 10% |
| | Final examination | | | |
| | Final examination (oral) | | 30 | 30 % |
| Total | | 100 | 100 % | |
| Webpage | www.tfzv.ues.rs.ba | | | |
| Date | 2023 | | | |