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| Module designation | Physical Chemistry |
| Module level, if applicable | Undergraduate |
| Code, if applicable | PIPAUM6602 |
| Subtitle, if applicable | - |
| Courses, if applicable | - |
| Semester(s) in which the module is taught | Even/Autumn Term |
| Person responsible for the module | Muhammad Fajar Marsuki, S.Pd., M.Sc. |
| Lecturer | Muhammad Fajar Marsuki, S.Pd., M.Sc., Dr. Yahmin, M.Si. |
| Language | Bahasa Indonesia |
| Relation to curriculum | Undergraduate degree program, compulsory, 4 th semester |
| Type of teaching, contact hours | Direct Instruction for Lectures, Cooperative Learning for Experiments, 100 minutes for lectures and 170 minutes for experiments per week |
| Workload | <ol style="list-style-type: none"> 1. Lectures: 2 x 50 = 100 minutes (1,67 hours) per week 2. Exercise and Assigments: 2 x 60 minutes = 120 minutes (2 hours) per week 3. Private Study: 2 x 60 minutes = 120 minutes (2 hours) per week 4. Experiments: 170 minutes per week |
| Credit points | 3 credit points (~4.76 ECTS-eq) |
| Requirements according to the examination regulations | A student must have attended at least 80% of the lectures to sit in the exams. |
| Recommended prerequisites | Basic Chemistry II |
| Module objectives/intended learning outcomes | <p>After completing this module, students are expected to:</p> <p>LO4: analyze science phenomena in an integrated manner to solve problems logically, critically, systematically, and critically using information technology as data resources in the form of team work that respect the originality of other works.</p> |
| Content | <ol style="list-style-type: none"> 1. Colligative Properties of Solution; decrease in vapor pressure, decrease in freezing point, increase in boiling |

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| | <p>point, and osmotic pressure in electrolyte and non-electrolyte solutions</p> <ol style="list-style-type: none"> 2. Thermodynamics; Thermodynamic laws and their applications in living systems 3. Chemical equilibrium; types of equilibrium reactions, equilibrium constants and equilibrium shifts 4. Chemical kinetics; reaction rate, reaction rate equation, reaction order, collision theory 5. Thermochemistry; Systems and environment, heat of reaction, Hess's Law 6. Electrochemistry; Galvanic cells and electrolysis cells |
| Study and examination requirements and forms of examination | Assessment of student learning achievement by assessing daily assignments, class discussions, practical performance, writing experiment reports, midterm and final semester exams. |
| Media employed | Whiteboard, Power Point, Platform Youtube, Moodle (SIPEJAR) |
| Reading list | <ol style="list-style-type: none"> 1. Penuntun Praktikum Kimia Fisika untuk Program Studi Pendidikan IPA FMIPA Universitas Negeri Malang. 2. Jespersen, N.D., Brady, J.E. & Hyslop, A. 2011. Chemistry the Molecular Nature of Matter. (6th Edition). New York: John Wiley and Sons, Inc. 3. Atkins, P.W. & de Paula, J. 2011. Physical Chemistry for Life Sciences. (2nd Edition). New York: W.H. Freeman Company. 4. Baird, C. 2006. Chemistry in Your Life. (2nd edition). New York: W. H. Freeman Company. |
| Date of last amendment made | May, 2020 |