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| Course Name [科目名] | Physical Chemistry |
| Instructor Name [教員] | Makoto Sakurai, Chihiro Fushimi, Susumu Inasawa |
| Office Hours and Contact Information  [オフィスアワー、連絡先] | Office hours: Wednesday 5-6 PM,  M. Sarakurai, Building 4-319, sakuraim@cc.tuat.ac.jp  C. Fushimi, Building 4-322, cfushimi@cc.tuat.ac.jp  S. Inasawa, Building BASE-232, inasawa@cc.tuat.ac.jp |
| Course Structure [授業形態] | Lecture |
| Course Credits [単位数] | 3 |
| Course Overview [概要] | Introduction to engineering thermodynamics, phase equilibria, basic electrochemistry, kinetics, reaction rate and adsorption. |
| Course Key Words [キーワード] | thermodynamics, equilibria, Gibbs free energy, rate constant, Arrehenius, rate-determining step |
| Academic Goal [目標] | 1. To understand thermodynamics and equilibria  2. To understand kinetics including reaction rate and mass transfer |
| Course Schedule [授業内容] | 1. Guidance and The First law  2. Energy balance of closed systems  3. Energy balance of control volumes  4. The Second law I: Entropy  5. The Second law II: Cycle  6. Chemical potential, The location of phase boundaries  7. The thermodynamic description of mixtures, Raoult’s law, Henry’s law  8. The properties of solutions, Activities  9. The response of equilibria to the conditions  10. Equilibrium electrochemistry  11. Molecular collisions  12. Diffusion  13. Chemical reaction  14. Adsorption and surface reaction  15. Examination |
| Textbooks, References,  and Supplementary Materials  [テキスト、参考書、その他] | 1. Y. A. Cengel and M. A. Boles “Thermodynamics, An Engineering Approach Sixth Edition, McGraw Hill, Singapore, 2007 2. P. Atkins, J. De Paula “Atkins’ Physical Chemistry” 9th edition, Oxford, China, 2010 |
| Grading Philosophy  (Percentage / Criteria / Methodology)  [成績評価の方法] | Examination |
| Other  (i.e. Expectations on Classroom  Conduct and Decorum etc.)  [その他] |  |