

Chm511: Advanced Analytical Chemistry I **Spring Term, 2017**

Instructor: Jay (Jiyeon) Kim, Assistant Professor
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Lecture: T,TH, 11:00 am-12:15pm
Room 215, Beupre

Text: Electrochemical Methods, 2nd Ed., by A. J. Bard and L. R. Faulkner
John Wiley & Sons, Inc., 2001.

Goals: To understand the fundamental of electrochemistry and the application of electrochemical methods to chemical problems with emphasis on quantitative interpretation of electrochemical results. Note that topics such as electron transfer reaction, interfacial structure, interfacial potential, and diffusion process, which are repeatedly discussed in this course, are important in many scientific fields.

Topics:

1. Introduction and Overview of Electrochemical Methods (Ch. 1)
2. Potentials and Cell Thermodynamics (Ch. 2)
3. Kinetics of Electrode Reactions (Ch. 3)
4. Mass Transfer (Ch. 4)
5. Controlled Potential Methods (Ch. 5)
6. Linear Sweep and Cyclic Voltammetry (Ch. 6)
7. Double Layer Structure and Adsorption (Ch. 13)
8. Electroactive Layers and Modified Electrodes (Ch. 14)
9. Analysis of Electrode Reaction Mechanisms (Ch. 12)
10. Ultramicroelectrodes and SECM (Ch. 16)
11. Stochastic nanoelectrochemistry

Examination: A take-home midterm examination (150 point) is scheduled early March. A final examination (150 point) will be given in Beupre 215 at 8-11 am on May 4th.

Class off: No class on Apr 6th.

Problem Sets: Some problems at the end of each chapter in the textbook will be assigned during the course. They are collected and graded (each 15 points).

Participation: One-sentence feedback about lecture, each worth one point, is welcome. You may e-mail it to jkim@chm.uri.edu by the beginning of the next class. Please use **"CHM 511" as subject.**