

Syllabus Chem 6153, Spring 2012

Instructor – CR Martin, profcrmartin@gmail.com

General statement of objectives - Electrochemistry is one of the most ancient of the chemical sciences, and yet it remains critically important to modern industry and technology, indeed, to modern life itself. Electrochemistry provides us with the batteries that power our portable lives, and with the commodity chemicals, metals and plastics that have created the modern era. **Life is based on electrochemistry.**

Course Plan – Electrochemistry is challenging because you must learn from so many different fields of science and engineering. Fields that contribute to the knowledge base of electrochemistry include thermodynamics, chemical kinetics, transport theory, instrumentation, and electronics.

The class has two parts. The first is the basics. We will review the thermodynamics of electrochemistry and the transport processes that are essential to making a “redox reaction” occur. One cannot appreciate the inherent beauty of electrochemistry without understanding these basic-science issues.

The second part concerns the methods of electrochemistry. We will discuss cyclic voltammetry, the workhorse tool of modern electrochemical research, chronoamperometry, chronocoulometry, etc.

Office Hours – Wednesdays at 1:45 PM, CLB 218

Text – Bard and Faulkner, *Electrochemical Methods*, 2nd Edition

Chapters Covered –Chaps 1 through 6

Grading – There will be a midterm and a final exam.

Homework -

1.1, 1.4, 1.5, 1.6, 1.10
2.1 (a,b,c,d), 2.3, 2.4 (a,b,c,d), 2.6, 2.10, 2.13, 2.14 (a,b), 2.18
3.1, 3.5, 3.6, 3.7, 3.9, 3.11, 3.12
4.1, 4.2, 4.3, 4.4, 4.5
5.2, 5.3, 5.4, 5.6, 5.7, 5.14, 5.17,
6.3, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10

These will not be collected

But I will periodically ask students to come to the board and work problems