CHEM 159 – Advanced Analytical Chemistry, subject BATTERY ELECTROCHEMISTRY

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Class Meetings / Office Hours:

Seminar:	F	10:00 - 10:50 AM	DH-515
Office Hours:	T,W	01:15 - 02:15 PM or by appointment	DH-004B
Final Exam:	R, Dec 8th,	7:15-9:30 AM	DH 250

Prerequisites: Upper Division or Graduate Standing / Chem 55

Text: None required. Useful resources include Bard and Faulkner "Electrochemical Methods"

Lecture Notes and Activity Instructions: These will be distributed via the course website on Canvas. https://sjsu.instructure.com/

Objectives: Basic thermodynamics and kinetic theory and practice of electrochemistry, applied to thermodynamic analysis, chemical analysis, batteries and fuel cells.

Grading: A single letter grade will be assigned for Chem 159.

Preliminary plans for grading structure:
Lecture Grade: 550 points

One-hour exam:	100 points
Final two-hour exam:	200 points
Quizzes	50 points

Grading Scale by percent of total points:												
96	92	88	84	80	76	72	68	64	60	56	52	<52
A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F

Overview of Proposed Lecture Topics
Lecture notes will be posted on Canvas.

Week	Overview of Proposed Lecture Topics	
1	Thermodynamics of Electrochemical Reactions	
2	Nernst Equation and Cell Potentials	
3	Electrochemical Kinetics, Butler-Vollmer and Electron Hopping Conduction	
4	Concentration Gradient and Electrical Gradient Conduction	
5	Potential Step Experiments for Reversible Cells	
6	Potential Step Experiments for Irreversible Cells	
7	Potential Sweep Methods	
8	Potential Sweep Methods for Irreversible Cells	
9	Potential Sweep Methods for E-C Reactions	
10	Modeling Electrochemical Sweeps	
11	Modeling Electrochemical Sweep Reactions for Irreversible Reactions	
12	Batteries	
13	Fuel Cells	
14	Potentiometric Sensors	
15	Glucose Sensors	

Due Dates and Policy on Late Work:
I all material are submitted via Canvas, so submission after the due date will not be possible except in extenuating circumstances and by agreement with me. Exercises will typically be due before the beginning of the next activity period.

Drop Policy:
The deadline to drop classes without a W is Tuesday, September 3rd. The deadline to add is Tuesday, September 10th. After the regular drop period ends, only documented medical or similar emergencies will be accepted as a valid reason to drop a course. Note particularly that a change in work schedule is no longer an acceptable reason. Therefore, it is critical that you inform your employer that you have a serious commitment for your scheduled class and laboratory times during the whole semester. If your employer cannot guarantee that you can meet this obligation, then you should drop the class in order to allow someone who can fulfill this commitment to register. Also, be aware of the fact that "unsatisfactory performance in course work and protection of your GPA is not a serious and compelling reason in itself for requesting permission to drop". After the twentieth day of instruction, all petitions to drop classes or withdraw from school will be reviewed by the Director of Academic Services. Petitions are available in the Student Resource Center.

ADDENDUM TO ALL CHEMISTRY DEPARTMENT GREENSHEETS

(Except Chem 291 Sections)

Revised August 2016

University Policy

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on the Office of Graduate and Undergraduate Programs' Syllabus Information Web Page at
http://www.sjsu.edu/gup/syllabusinfo/

CHEMICAL SAFETY – ***all courses***

Chem 120S is a required course for all chemistry majors and minors and a prerequisite for all Chem 180/298 research.

EMERGENCIES AND EVACUATIONS – ***all courses***

If you hear a continuously sounding alarm, or are told to evacuate by Emergency Coordinators (colored badge identification), walk quickly to the nearest stairway (end of each hall). Take your personal belongings, as you may not be allowed to immediately return. Follow instructions of Emergency Coordinators. Be quiet so you can hear. Once outside, move away from the building. Do no return to the building unless the Police or Emergency Coordinators announce that you may.

DISABLED STUDENTS – ***all courses***

Campus policy in compliance with the Americans with Disabilities Act: "If you need course adaptations or accommodations because of a disability, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 requires that students with disabilities requesting accommodations must register with DRC to establish a record of their disability."

ACADEMIC INTEGRITY STATEMENT – ***all courses*** (from the Office of Student Conduct and Ethical Development):

"Your own commitment to learning, as evidenced by your enrollment at San José State University, and the University's Academic Integrity Policy requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the Office of Student Conduct and Ethical Development. The policy on academic integrity can be found at http://sa.sjsu.edu/student_conduct.

LABORATORY SAFETY – ***all laboratory courses***

You should read the safety section of the SJSU Catalog under Chemistry Department (page 121 in the 2006/08 Catalog). Note in particular: “Failure to comply with proper procedures and prescribed safety cautions shall subject the student to disciplinary action. 1) Any student who engages in unauthorized experimentation, or who seriously disregards safety, thereby endangering self or others shall be withdrawn immediately from the class with a grade of F. 2) Any student who shows persistent disregard for safety may have his/her grade lowered, and may risk being withdrawn with a final grade of F.”