Course	**CHEM 505 / Electrochemistry**
Instructor	Selmiye Alkan Gürsel
Term	2020-2021 Spring
Hours of classroom	*Monday* ***11.40-13.30*** *Wednesday* ***14.40-15.30***

Instructor's Contact Information

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Teaching Assistant

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General Course Information

Course Description	This course is designed to be a comprehensive introduction to fundamentals of electrochemistry, modern electrochemical methods and applications of electrochemistry.
Objectives	• To provide a foundation in theoretical electrochemistry which is sufficient for the understanding of many basic phenomena. • To teach the theory behind a number of advanced electrochemical methods. • To familiarize the student with those electrochemical methods that are exploited in many electroanalytical and technologically important applications such as batteries and fuel cells.
Reference Books	There will be no textbook for this course. You can study from lecture notes and reference books on *Electrochemistry*. Several examples are given below: • Rieger, **Electrochemistry**, 2nd edition. (Chapman &Hall, 1994). • Bard and Faulkner, **Electrochemical techniques: fundamentals** **& applications**, 2nd edition, (Wiley, 2001) • Sawyer, Sobkowiak and Roberts, **Electrochemistry for chemists,** (Wiley,1995) • Bockris, and Reddy, **Modern electrochemistry**, (Plenum, 1998)
Top Hat **(online response system)**	In lectures, we will use an online response system called TopHat accessible from tophat.com on your web browser, or through free Top Hat app (tophat.com/mobile-apps) if using tablet. If you have not used the system before, please review this "Getting Started" guide before the first lecture. You must log in Top Hat with your SU email account name and bring a device connected to SABANCIUNIV WiFi to each lecture.

Grading	*Top Hat activities– 20 %* *Homework – 20 %* *Project – 30 %* *Final exam – 30 %*

Tentative Course Schedule

Date	***Topic***
February 22 & 26	Introduction
March 1 & 5	Part I: Fundamentals of Electrochemistry A) Terminology, History, Electrode-Electrolyte Interface, Electrochemical Cells, Standard Half Cell Potentials, Electrochemical Series
March 8 & 12	Part I: Fundamentals of Electrochemistry A) Terminology, History, Electrode-Electrolyte Interface, Electrochemical Cells, Standard Half Cell Potentials, Electrochemical Series
March 15 & 19	Part I: Fundamentals of Electrochemistry B) Electrodes, Electrode Reactions, Electrode Kinetics, Motion of Particles in Solution, Electrical Conductivity
March 22 & 26	Part I: Fundamentals of Electrochemistry C) Thermodynamics of Electrochemistry, Electrolysis, Faraday's Law, Nernst Equation
March 29 & April 2	Part II: Basic Techniques in Electrochemistry A) Electrochemical Measurement, Potentiostatic & Galvanostatic Methods
April 5 & 9	Part II: Basic Techniques in Electrochemistry B) Voltammetry, Polarography, Cyclic Voltammetry
April 12 & 16	Part II: Basic Techniques in Electrochemistry C) Electrochemical Impedance Spectroscopy
April 19	Part II: Basic Techniques in Electrochemistry C) Electrochemical Impedance Spectroscopy
April 26 & 30	Part III: Applications of Electrochemistry A) Fuel Cells
May 3 & 7	Part III: Applications of Electrochemistry B) Batteries
May 10	Project Presentations
May 17 & 21	Project Presentations
May 24 & 28	Project Presentations