**ANALYTICAL CHEMISTRY (II)**

**Course Description**: An introduction to Electrochemistry and Electroanalytical Techniques. CHEM- 23226

**Textbooks:**

1. D. A. Skoog, D. M. West, F. J. Holler, and S. R. Crouch: “Fundamental of Analytical Chemistry”, 8th Edition.
2. Daniel C. Harris , “ Quantitative Chemical Analysis” , 6th or 7th Edition.

**Lectures Coverage:**

1. **Introduction to Electrochemistry**
   * Oxidation-Reduction reactions, Electrochemical cells, Electrodes potentials, The Nernst equation,
2. **Application of Standard Electrode Potential**
   * Calculation potentials of electrochemical cells, Calculating redox equilibrium constants, Redox titration curves, Oxidation- Reduction indicators
3. **Applications of Oxidation/Reduction Titrations**
   * Auxiliary reducing and oxidizing reagents, Applying oxidizing and reducing agents …
4. **Electrode and Potentiometry**
   * Reference electrodes, Indicator electrodes, Membrane electrodes, The glass electrode for measuring pH, Liquid- membrane electrodes, Crystalline membrane electrodes, Ion- selective field effect transistors, Gas sensing probes, Direct potentiometry, Potentiometric titrations,
5. **Bulk Electrolysis: Electrogravimetry and Coulometry**
   * The effect of current on cell potential, Ohmic potential; IR drop, Polarization effects, Electrogravimetric methods, Electrogravimetry without Potential Control, Controlled-Potential Electrogravimetry, Coulometric methods
6. **Voltammetry and Electroanalytical Techniques**

- Voltammetric electrodes, Voltammograms, linear sweep voltammetry, Hydrodynamic voltammetry, Polarography, Pulse polarographic and voltammetric methods (Differential pulse polarography, Square wave polarography, Cyclic voltammetry, Stripping methods), amperometric

and biamperometric methods,…

1. **Conductometric Methods**