CHEM 300: Analytical Chemistry

This detailed course description provides information about course topics & content. It is not a course syllabus. Summer 2013 course syllabi are updated in the spring, and may not be available until summer classes begin.

Instructor Information

Instructor	Email	Course Format	Number of Credits
Stephen Mang	smang@umbc.edu	Lecture, Lab	4

General Information

Course Format Other

Each week, students will attend two three-hour lectures and two four-hour labs.

Delivery Format

In-Person

Prerequisite /Co-requisite:

CHEM 102, 102L

Course Materials

Currently Used Materials

• Harris, "Quantitative Chemical Analysis", 8th ed.

Course Objectives/Learning Outcomes:

Chemistry 300 is a course in analytical chemistry that combines a lecture, a discussion session that uses active learning methods, and a laboratory. Chemistry 300 will expose you to the theory and practice of quantitative chemical analysis and chemical equilibria. Active learning methods will be used in the Friday discussion sections and will also be incorporated into the lecture, in accordance with many recent studies on the ways in which students retain knowledge. Laboratories will loosely follow the topics covered in lecture, giving you a chance to experience the topics covered in Chemistry 300 with hands-on activities.

The following are the course objectives for Chemistry 300. Upon successful completion of this course:

- You will have a thorough understanding of the principles and theory behind chemical equilibria, quantitative analyses, and the laboratory equipment used to do real-world analytical chemistry.
- You will be able to interpret the results of quantitative experiments and interpret the data in meaningful ways.

Potential Topics Covered:

Lecture topics:

- Measurements and Error

- Statistics
- Sample Preparation and Quantitation
- Chemical Equilibria and Activity
- Titrations and Volumetric Analysis
- Redox Titrations
- Analytical Separations
- Gas and Liquid Chromatography
- Mass Spectrometry, GC/MS, LC/MS
- Chromatographic Methods
- Capillary Electrophoresis
- Spectrophotometry and Spectroscopy
- Lab experiments to be performed include:
- Drying to Constant Mass
- Calibration of Volumetric Glassware
- Neutralization Titration
- Precipitation Titration
- Complexometric Titration
- Redox Titration
- Redox Back-Titration
- Potentiometric Acid-Base Titration
- Absorption Spectrophotometry

Instructions for Visiting Students:

Proof of completion must be submitted for courses equivalent to CHEM 102 and 102L. A grade of C or better must have been earned in each case.