

UNIVERSITY OF PUERTO RICO AT ARECIBO
PHYSICS/CHEMISTRY DEPARTMENT
BACHELOR OF TECHNOLOGY IN INDUSTRIAL CHEMICAL PROCESSES

Course N°: QUIM 3025

Title of Course: Analytical Chemistry

Credits: 4

Open to: Natural Science and Industrial Chemical Processes Technology students

Contact Hours: 3/weekly

Pre-requisite: QUIM 3002 / TEQU 3003

Textbook: Fundamental of Analytical Chemistry

Co-requisite: QUIM 3026

Author: Skoog, D.A., West, D.M., Holler, F.J., and Crouch, S.R.

Publisher: Brooks/Cole

Publication Year: 2004

Other Supplemental Materials:

- Analytical Chemistry for Technicians, by Kenkel, John. Boca Raton : Lewis Publishers, 2003.
- Quality and reliability in analytical chemistry, by Aboul-Enein, Hassan Y. Boca Raton : CRC Press, 2001.

Term: First Semester

Course Coordinator: Dr. Fernando L. Herrera

Course Description: Study of theory and methods for qualitative and quantitative analysis using gravimetric and volumetric methods, including potentiometric titration. Introduction to the spectrophotometric methods of analysis with emphasis on the ultraviolet-visible.

Course Objectives:

- Explain the principles that underlie the analysis methods commonly used such as volumetry, gravimetry, potentiometry, spectrophotometry, chromatography, analytical, radiochemistry, bioanalytical and environmental.
- Solve problems using data generated from analytical methods.
- Determine the statistical reliability of analysis results.
- Apply the knowledge gained to other areas such as pharmacy, biology and environmental sciences.

Relation of Course to Program Objectives:

1	2	3	4
x			

Relation of Course to Program Outcomes:

1	2	3	4	5	6	7	8	9	10	11
x	x	x								

Evaluation/Grade Reporting: 4 partial examinations (15% each), assignments and quizzes (15%), and final exam (25%)

Topics	Teaching/Learning Strategies Time Distribution (hours)
Introduction	Lectures and Assignments (1.5)
Statistical analysis	Lectures and Assignments (3)
Stoichiometry	Lectures and Assignments (1.5)
General concepts of balance	Lectures and Assignments (4.5)
Gravimetric analysis	Lectures and Assignments (2.5)
Acid-base	Lectures and Assignments (15)
Titration curves of acid-base	Lectures and Assignments (3.5)
Reactions and degrees complexometric	Lectures and Assignments (3)
Reactions and degrees of precipitation	Lectures and Assignments (1.5)
Basic concepts in instrumental analysis	Lectures and Assignments (1)
Fundamentals of electrochemistry	Lectures and Assignments (1.5)
Potentiometry	Lectures and Assignments (4.5)
Molecular absorption spectrophotometry	Lectures and Assignments (4)
Chromatographic methods	Lectures, and Assignments (3)
Total	45