

Introductory Instrumental Analysis

Chemistry 316

Section: D102

Term: 2002 Fall

Instructor: Dr. G. Agnes. Office: SSB-7102.

Discussion Topics: This course offers an in depth introduction to the main spectroscopic and chromatographic techniques that are in widespread use today. A limited selection of laboratory assignments amplify theoretical concepts. The principles of signal generation by chemical species and detailed descriptions of the components of instruments are given. The importance of optimization at all stages of an analysis, from sampling and sample preparation to signal detection and data analysis is discussed.

2 lecture hours/week; 0 tutorial hour/week; 4 lab hours.

Lecture Topics:

Instrumental based chemical measurement; signal generation & interpretation; electronic principles - analog, digital, noise signal-to-noise ratio; sample preparation; interferences & optimization; data treatment - statistical tests, standard deviation, precision, accuracy, calibration curve fitting, least squares method, standard addition, internal & external standardization, detection limit; atomic & molecular spectroscopic chromatographic techniques - AAS, AES, ICPS, molecular absorption, molecular fluorescence; Beer's Law; chromatographic techniques - GC, LC, HPLC, IEC, SEC, TLC; separation theory; detector systems; van Deemter equation; electroanalytical techniques - potentiometry, coulometry, voltammetry.

Laboratory Assignments:

Assignments include gas chromatography (GC), high performance liquid chromatography (HPLC), atomic absorption & emission spectroscopy (AAS & AES) molecular absorption & fluorescence spectroscopy and Introduction to Electronics for Scientists.

Grading: 20% Midterm Exam I, 30% Final Exam, 50% Laboratory Reports.

Required Texts: Skoog, Holler and Nieman, "Principles of Instrumental Analysis" 5th Ed. 1998. Publishers: Holt Rinehart.

Recommended Texts: None

Materials/Supplies: None

Prerequisite/Corequisite: Prerequisite CHEM 215 (or 218). Students may not count both Chem 316 and Chem 416 for credit.

Notes: None

This outline is derived from a course outline repository database that was maintained by SFU Student Services and the University's IT Services Department. The database was retired in

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2014 and the data migrated to SFU Archives in 2015.