Course outline for CHM C11. "Introduction to Instrumental Analysis"

An introduction to the workings and application of modern analytical instrumentation. A range of modern instrumentation including NMR spectroscopy, Mass Spectrometry, Microscopy, Light Spectroscopy (Visible, Ultra Violet, Infrared, Fluorescence, Phosphorescence), X-ray, Chromatography and electrochemical separations will be addressed. Principles of measurement; detection of photons, electrons and ions; instrument and experiment design and application; noise reduction techniques and signal-to-noise optimization will be covered

This will be a lecturer based course with additional tutorials.

Assessment will be through

2 x Assignments = 40%
1 Mid Term Quiz = 20%
1 Final Exam = 40%

Atomic Detectors

Atomic Spectroscopy
Atomic Emission
Atomic Mass Spectroscopy

Molecular Detectors

Ultraviolet Visible Spectroscopy
Fourier Transform Infrared Spectroscopy
Nuclear Magnetic Resonance Spectroscopy
Mass Spectrometry
Luminescence,
Phosphorescence and Fluorescence.

Separations

Gas Chromatography
High Pressure Liquid Chromatography
Capillary Electrophoresis

Microscopy

Scanning Electron Microscopy
Atomic Force Microscopy
Scanning Tunneling Electron Microscopy
X-ray Analysis

Advanced Hyphenated Analytical Instruments 1

GC-MS
LC-MS
LC-NMR-MS
LC-SPE-NMR-MS