

<b>Module Title</b> <b>Analytical Science 2</b>	Reference AS2041 SCQF Level SCQF 8 SCQF Points 15 ECTS Points 7.5 Created May 2002 Approved September 2004 Amended May 2011 Version No. 4
<b>Keywords</b> Electrochemical cells, potentiometry, X-Rays, QA/QC Atomic Spectroscopy	

## This Version is No Longer Current

The latest version of this module is available [here](#)

### Prerequisites for Module

Analytical Techniques for Life Sciences (AS1802) or equivalent.

Quality: the role and practice of QA/QC including QA manual, standards, control charts, auditing and laboratory accreditation.  
Basic instrumentation, techniques and applications of flame atomic absorption & emission spectroscopy.

### Corequisite Modules

None.

### Indicative Student Workload

### Precluded Modules

None.

	Full Time	Distance Learning
<i>Contact Hours</i>		
Lectures	28	0
Tutorials/Case Studies	7	0

### Aims of Module

To provide students with the ability to explain the principles and evaluate the applications of a given range of techniques relevant to Analytical and Forensic Science.

<i>Directed Study</i>		
Directed Study	50	0
<i>Private Study</i>		
Private Study	65	150

### Mode of Delivery

### Learning Outcomes for Module

This is a lecture-based course supplemented with tutorial sessions and case studies.

On completion of this module, students are expected to be able to:

1. Discuss the basic principles, instrumentation, advantages and limitations of a range of electrochemical, X-ray and atomic spectroscopy techniques.
2. Explain the implementation and advantages of QA/QC and laboratory accreditation schemes in the analytical laboratory.

### Indicative Module Content

Basic electrochemistry: standard potential, IUPAC convention of cell representation, determination of cell potential, galvanic and electrolytic cells, liquid junction potentials.

Potentiometry: reference and ion selective electrodes, direct potentiometry, titrations.

Coulometry & conductivity: cell construction, Faraday's Laws, electrogravimetry, titrations.

Voltammetry: polarography, LSV, DPV

X-rays: X-ray production, wavelength and energy dispersive X-ray fluorescence spectrometry, Bragg's law.

The module will be delivered to distance learning students via the University's Virtual Learning Environment.

### Assessment Plan

	Learning Outcomes Assessed
Component 1	1,2
Component 2	1

Component 2 : Class Test

Component 1 : Closed book examination.

### Indicative Bibliography

1. SKOOG, D.A., HOLLER, F.J. AND CROUCH, S.R. *Principles of Instrumental Analysis*. Current Edition. Thomson Brooks/Cole.
2. PRICHARD, F.E. *Quality Assurance in Analytical Chemistry*. Current Edition. Chemistry Laboratory. Wiley.
3. MONK, P.M. *Fundamentals of Electroanalytical Chemistry*. Current Edition. Wiley