

This Version is No Longer Current
The latest version of this module is available [here](#)

MODULE DESCRIPTOR

Module Title

Analytical Science 2

| | | | |
|-----------|----------------|-------------|--------|
| Reference | AS2041 | Version | 7 |
| Created | August 2021 | SCQF Level | SCQF 8 |
| Approved | September 2004 | SCQF Points | 15 |
| Amended | August 2021 | ECTS Points | 7.5 |

Aims of Module

To provide students with knowledge and understanding of the principles and applications of a given range of techniques relevant to Analytical and Forensic Science. To offer students an understanding of relevant standards, reference materials, practice of quality assurance, safe working practices and method validation.

Learning Outcomes for Module

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

- 1 Understand the fundamental principles of electrochemical analysis and atomic spectroscopic techniques.
- 2 Explain the implementation and advantages of Quality Assurance and Quality Control as well as laboratory accreditation schemes in the analytical and forensic laboratory.
- 3 Describe the application of a range of electrochemical, X-ray and atomic spectroscopic techniques.

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

Module Delivery

This is a lecture based module supplemented with tutorial sessions and case studies. The module will be delivered to distance learning students via the University's Virtual Learning Environment.

| Indicative Student Workload | Full Time | Part Time |
|---|-----------|-----------|
| Contact Hours | 36 | 10 |
| Non-Contact Hours | 114 | 140 |
| Placement/Work-Based Learning Experience [Notional] Hours | N/A | N/A |
| TOTAL | 150 | 150 |
| Actual Placement hours for professional, statutory or regulatory body | | |

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

| | | | | | |
|--------------|--------------------------|------------|-----|--------------------|------|
| Type: | Coursework | Weighting: | 70% | Outcomes Assessed: | 2, 3 |
| Description: | Closed book written exam | | | | |

Component 2

| | | | | | |
|--------------|------------|------------|-----|--------------------|---|
| Type: | Coursework | Weighting: | 30% | Outcomes Assessed: | 1 |
| Description: | Class test | | | | |

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

The first grade represents Component 1 (EX1) weighted as major and the second, Component 2 (CW1), weighted as minor. A minimum module grade of D is required for a pass, with compensation of grade E in Component 1 or Component 2 permitted. Non-submission of either component will result in an NS grade.

| Module Grade | Minimum Requirements to achieve Module Grade: |
|--------------|--|
| A | AA, AB |
| B | AC, AD, AE, BA, BB, BC, CA |
| C | BD, BE, CB, CC, CD, DA, DB |
| D | CE, DC, DD, DE, EA, EB, EC |
| E | AF, BF, CF, DF, ED, EE, EF, FA, FB, FC, FD |
| F | FE, FF |
| NS | Non-submission of work by published deadline or non-attendance for examination |

Module Requirements

| | |
|--------------------------|---|
| Prerequisites for Module | Successful completion of Stage 1 Forensic and Analytical Science or equivalent. |
| Corequisites for module | None. |
| Precluded Modules | None. |

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