This Version is No Longer Current
The latest version of this module is available

MODULE DESCRIPTOR

Module Title

Analytical Science 1

Reference	AS2040	Version	6
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 the principles and applications of a range of chromatographic and spectroscopic techniques. To develop the understanding of error in analytical science and the appropriate methods of statistical methods for the assessment of analytical data. To provide students with the principles of simple and advanced calibration methods.

Learning Outcomes for Module

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

1	Describe and understand different types of error in analytical science and how they interact, knowing how to form reliable hypotheses, carry out significance testing and perform simple data analysis tasks.
2	Explain the theoretical principles of molecular spectroscopy and a range of chromatographic techniques, and describe the instrumentation and applications of these techniques.
3	Explain the theoretical principles and applications of a range of simple and advanced calibration techniques.

Indicative Module Content

Calibration methods: normal, standard additions, internal standards. Statistics for analytical science: Understanding errors, statistical tests, statistical significance testing. Analysis of variance. Chromatographic separations: gas, high performance liquid and thin layer chromatography, capillary electrophoresis. The Van Deempter Equation. Introduction to analytical spectroscopy: absorption and emission of radiation by molecules. Beer-Lambert Law. Instrumentation, techniques, applications of ultra-violet/visible and infrared spectrophotometery. Introduction to mass spectrometry.

Module Delivery

This is a lecture based module supplemented by tutorials, on-line support material and guided reading. The course 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:	Examination	Weighting:	70%	Outcomes Assessed:	1, 2
Description:	Closed book written exam				

Component 2

Type:	Coursework	Weighting:	30%	Outcomes Assessed:	3
Description:	Computer based exercise				

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   CURRELL, G. AND DOWMAN, A. *Essential Mathematics and Statistics for Science* . Current Edition. Wiley-Blackwell. Chichester, United Kingdom.

2   SKOOG, D. A., HOLLER, F. J. AND CROUCH, S. R. *Principles of Instrumental Analysis* . Current Edition. Thomson Brooks/Cole.

3   PRICHARD, F.E. Quality Assurance in Analytical Chemistry . Current Edition. Chemistry Laboratory. Wiley.

4   MONK, P.M. Fundamentals of Electroanalytical Chemistry . Current Edition. Wiley