

MODULE DESCRIPTOR

Module Title

Analytical Chemistry

Reference	PL3601	Version	1
Created	October 2023	SCQF Level	SCQF 9
Approved	January 2005	SCQF Points	15
Amended	September 2023	ECTS Points	7.5

Aims of Module

To enable students to develop a deeper understanding of the principles and applications of important analytical techniques.

Learning Outcomes for Module

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

- 1 Discuss the principles of spectroscopic, chromatographic, and mass spectrometry techniques used in forensic and analytical science.
- 2 Demonstrate problem solving skills in the application of spectroscopic, chromatographic, and mass spectrometry techniques used in forensic and analytical science.
- 3 Interpret spectral and chromatographic data obtained in forensic and analytical science applications.

Indicative Module Content

Advanced Spectroscopy: advanced atomic spectroscopy: Interferences, optimisation and sample introduction. FTIR and associated sampling techniques, FTIR microscope. Molecular Fluorescence and Raman Spectroscopy and mass spectrometry. Applications. Advanced chromatography; optimisation of separation including sample extraction (spe, spme and spde), derivatisation and the higher modes of CE (MEKE, CGE, CIEF and CEC). Mass spectrometry as a detection technique for chromatography; detail will include interfaces, tandem MS, TIC, SIM, SRM, MRM and the use of deuterated standards. Mobile phase optimisation for LC-MS and examples. This module aligns with United Nations Sustainable Development Goal 13: Climate Action: Students learn techniques which can be applied to environmental investigations, such as analysing pollutants or identifying sources of contamination.

Module Delivery

This is a lecture based module supplemented with tutorials and case studies.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	40	N/A
Non-Contact Hours	110	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

ASSESSMENT PLAN

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

Component 1

Type:	Examination	Weighting:	100%	Outcomes Assessed:	1, 2, 3
Description:	Closed book written examination.				

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

Component 1 (Examination) comprises 100%. A minimum of a Grade D is required to pass the module.

Module Grade	Minimum Requirements to achieve Module Grade:
A	A
B	B
C	C
D	D
E	E
F	F
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	Successful completion of Stage 2 Forensic and Analytical Science or equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

- 1 NEGRUSZ, A., AND COOPER, G. *Clarke's Analytical Forensic Toxicology*. Current Edition. Pharmaceutical Press.
- 2 SKOOG, D.A., WEST, D.M., HOLLER, F.J. AND CROUCH, S.R. *Fundamentals of Analytical Chemistry*. Current Edition. Brooks/Cole/Cengage Learning