Module Definition Form (MDF)

Module code: MOD005796	**Version:** 9 **Date Amended:** 10/Jul/2025

1. Module Title
Forensic Analytical Chemistry

2a. Module Leader
Lata Gautam

2b. School
School of Life Sciences

2c. Faculty
Faculty of Science and Engineering

3a. Level
5

3b. Module Type
Standard (fine graded)

4a. Credits
30

4b. Study Hours
300

5. Restrictions

Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	BSc (Hons) Forensic Science, BSc (Hons) Forensic Science (sandwich)		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

You will develop knowledge and gain experience of analysing "real" forensic samples using a variety of chromatographic techniques and gain knowledge about some of the advances in mass spectroscopic analysis. In addition, you will develop knowledge about some of the techniques that are used for the elemental analysis of forensic samples.

We will review the underlying quality management principles that are involved in such analyses, to gain a better understanding of analytical data and its critique, and develop good laboratory practice. In addition, you will appreciate the challenges of the chemical analysis of samples in an accredited laboratory including competency testing and method validation under ISO 17025.

You'll grow confident in choosing the appropriate choice of analytical method, and learn to understand the results that are generated, their interpretation, and how they are central to forensic chemistry. You will be taught through lectures, problem-based tutorials, and practical sessions and will gain hands-on experience of using different types of instrumentation, gaining proficiency in preparing different standards and samples.

You will study a wide range of topics that will prepare you to become an analytical scientist by developing the skills and knowledge to work in laboratories specialising in forensic analytical chemistry.

6b. Outline Content

* The choice of analytical method

* Chromatographic analysis including HPLC and GC (with appropriate detectors), advances in mass spectroscopic analysis, and elemental analysis including ICP-AES and ICP-MS.

* Quantitative errors and statistical analysis.

* Quality management systems in the laboratory and analysis including method validation, laboratory accreditation and standards in forensic science.

* The application of chromatographic and spectroscopic techniques to the analysis of forensic and trace evidence.

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources

Analytical instrumentation and electronic and journal data bases.

7. Learning Outcomes (threshold standards)		
No.	**Type**	**On successful completion of this module the student will be expected to be able to:**
1	Knowledge and Understanding	Explain the principles of various analytical methods appropriate to a range of analytes.
2	Knowledge and Understanding	Evaluate the relevance and significance of the data generated by forensic analytical chemistry methods.
3	Knowledge and Understanding	Justify the use of method validation, quality assurance and accreditation, in the development of analytical methods within forensic chemical analytical laboratories
4	Intellectual, practical, affective and transferrable skills	Perform analytical laboratory techniques while demonstrating good laboratory practice
5	Intellectual, practical, affective and transferrable skills	Critically interpret forensic analytical chemistry results, with the consideration of quality management processes
6	Intellectual, practical, affective and transferrable skills	Communicate forensic analytical chemistry results appropriately to various audiences.

8a. Module Occurrence to which this MDF Refers				
Year	**Occurrence**	**Period**	**Location**	**Mode of Delivery**
2026/7	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	33	1-6	11 x 3 hours Lectures/active learning
Other teacher managed learning	39	1-6	Practicals (5 x 4 hrs); Tutorials (2 x 2 hrs & 2 x 3 hrs); Presentation (6 hrs); Revision (3 hrs)
Student managed learning	228	1-6	Background reading, online activities, preparation for lectures and practicals, and completion of assessments
TOTAL:	300		

9. Assessment for the above Module Occurrence

The assessment for some modules includes a presentation (see below for details on how this particular module is assessed). We recognise that presenting, especially to a large group, can cause significant anxiety or distress for some students. If this may affect you, please contact your Module Leader or the Disability and Neurodiversity Service as early as possible. We will work with you to consider appropriate reasonable adjustments. Depending on your individual needs, these might include, for example, presenting to a smaller group or presenting only to a member of academic staff.

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
010	Practical	1-4	70 (%)	Fine Grade	30 (%)

3000 words equivalent that includes: 1 laboratory workbook (2500 words) and a 30 minute competency-based laboratory task (500 word equivalent)

Assessment components for Element 010

Component No.	Assessment Title	Submission Method	Weighting (%)	Components needed for Mark Calculation?
010/1	Laboratory Report (2500 words)	Canvas	60 (%)	All
010/2	Competency Based Test (500 word equivalent)	Scheduled Activity: Timetabled assessment task	40 (%)	

Assessment No.	Assessment Method	Learning Outcomes	Weighting (%)	Fine Grade or Pass/Fail	Qualifying Mark (%)
011	Practical	5-6	30 (%)	Fine Grade	30 (%)

10 minute presentation (1000 words equivalent)

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]