

CH3H1-15 Analytical Science for Global Challenges

26/27

Department

Chemistry

Level

Undergraduate Level 3

Module leader

Nikola Chmel

Credit value

15

Module duration

5 weeks

Assessment

20% coursework, 80% exam

Study location

University of Warwick main campus, Coventry

Description

Introductory description

This module builds on core concepts covered in Year 1 and Year 2 modules and laboratories and expands knowledge and understanding of modern analytical methods and techniques as applied to real-world challenges. Each lecture will be driven by a “challenge” ranging from collection and preparation of a representative sample (e.g. in an environmental setting where sample concentration might depend on the rain levels, or in space or on another planet), through data acquisition (how to choose appropriate technique and method for the sample) to data analysis and interpretation. The challenge driven lectures will be supported by practical workshops on data interpretation and analysis.

[Module web page](#)

Module aims

By the end of the module, students should be able to use their knowledge to propose analytical approaches to tackle problems in a broad range of fields, including: biomedical, environmental, materials and heritage research.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

The module is split into 4 topics that will be delivered via lectures (21 lectures total) and supported by workshops (4 workshops). Each section will cover a separate technique/family of techniques, with the applications and case studies forming a coherent narrative across the module.

1. Introduction and Chromatography
2. Mass Spectrometry
3. XRD and Diffraction Methods
4. NMR in Drug Design

Learning outcomes

By the end of the module, students should be able to:

- Describe and critically assess a wide range of instrumental techniques and methods relevant to analytical science.
- Engage effectively with research within analytical science, and use it to advance their understanding.
- Describe and explain appropriate methods for data analysis (including data fitting methods and error analysis) and interpretation, and apply these to experimental datasets of varying complexity, using appropriate software, databases and other digital resources.

Indicative reading list

[Reading lists can be found in Talis](#)

[Specific reading list for the module](#)

Subject specific skills

Data analysis and interpretation, including data fitting methods and error analysis.

Transferable skills

Critical Thinking

Digital Literacy

Information Literacy

Problem Solving

Professionalism

Study

Study time

Type	Required
Lectures	21 sessions of 1 hour (14%)
Practical classes	4 sessions of 1 hour (3%)
Private study	125 hours (83%)
Total	150 hours

Private study description

N/A

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group D

Assessment component	Weighting	Study time	Eligible for self-certification
Problem set	20%		Yes (extension)
Three short homework assessments due after the workshops for each of MS, XRD and NMR sections, equal weighting (1 CAT each), marked using a rubric.			

Reassessment component is the same

Assessment component

Centrally-timetabled examination (On-campus)	80%		No
--	-----	--	----

Weighting**Study time****Eligible for self-certification**

Written Examination

- Answerbook Pink (12 page)
- Students may use a calculator
- Periodic Tables

Reassessment component is the same

Feedback on assessment

Cohort level examination feedback provided via Moodle following the Exam Board.

[Past exam papers for CH3H1](#)

Availability**Courses**

This module is Option list A for:

- UCHA-4 Undergraduate Chemistry (with Intercalated Year) Variants
 - Year 4 of F101 Chemistry (with Intercalated Year)
 - Year 4 of F122 Chemistry with Medicinal Chemistry (with Intercalated Year)
- UCHA-3 Undergraduate Chemistry 3 Year Variants
 - Year 3 of F100 Chemistry
 - Year 3 of F121 Chemistry with Medicinal Chemistry
- Year 3 of UCHA-F110 Undergraduate Master of Chemistry (with Industrial Placement)
- Year 4 of UCHA-F107 Undergraduate Master of Chemistry (with Intercalated Year)
- UCHA-F109 Undergraduate Master of Chemistry (with International Placement)
 - Year 3 of F109 MChem Chemistry (with International Placement)
 - Year 3 of F111 MChem Chemistry with Medicinal Chemistry (with International Placement)
- UCHA-4M Undergraduate Master of Chemistry Variants
 - Year 3 of F100 Chemistry
 - Year 3 of F105 Chemistry
 - Year 3 of F109 MChem Chemistry (with International Placement)
 - Year 3 of F125 MChem Chemistry with Medicinal Chemistry
- Year 4 of UCHA-F127 Undergraduate Master of Chemistry with Medicinal Chemistry (with Intercalated Year)