

Module specification

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Module Code	SCI527
Module Title	Laboratory Instrumental Analysis
Level	5
Credit value	20
Faculty	FAST
HECoS Code	100413
Cost Code	GAFS

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BSc (Hons) Forensic Science	Option
BSc (Hons) Forensic Science with Placement Year	Option

Pre-requisites

SCI443 Introduction to Chemistry
 SCI458 Essential Laboratory Skills

Breakdown of module hours

Learning and teaching hours	6 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	24 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	30 hrs
Placement / work based learning	0 hrs
Guided independent study	170 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	Mar 18
With effect from date	Sept 18
Date and details of revision	10/05/2023 AB approval of BSc (Hons) Forensic Science validation (module update)
Version number	2

Module aims

This module aims to introduce students to the practical side of spectroscopic and chromatographic techniques and develop their competence in operating a range of modern analytical instruments for forensic related samples and conversant use of related computer software. It also aims to provide training to the students on the understanding of parameters involved in method selection in experimental design, adherence to safe laboratory working procedures (e.g. PPE requirements, risk assessments and COSHH assessments) and academic transferrable skills (e.g. literature survey, , data acquisition, result analysis and report writing-up).

Module Learning Outcomes - at the end of this module, students will be able to:

1	Justify the suitability of experimental methods for forensic instrumental analysis.
2	Demonstrate sample preparation and operational skills using the advanced analytical instruments.
3	Acquire and critically assess experimental results with comparison to standards or databases.
4	Appreciate the advantages and limitations of the analytical instruments covered in this module and their forensic applications.

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Assessment 1: Portfolio (~3500 words)

Students will submit a portfolio of three lab reports, including introduction, methodology, experimental results together with a reflective commentary *etc.* The value of those instrumental techniques in forensic sample analysis needs to be highlighted. All the external information should be properly referenced.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1-4	Portfolio	100

Derogations

None

Learning and Teaching Strategies

The module will be delivered in line with the University's Active Learning Framework and will involve:

- Laboratory experiments
- Directed study via Moodle VLE
- Student directed study

Students will gain hands-on practical skills in the laboratory. Directed self-study will guide students through the development of presentation skills and give students the opportunity to broaden their knowledge and understanding in areas of specific interest to them. COSHH and Risk Assessment forms are required before each practical session.

Indicative Syllabus Outline

- Paper chromatography
- Gas chromatography-mass spectrometry
- High-performance liquid chromatography
- UV-vis spectroscopy
- IR spectroscopy
- Fluorescence spectroscopy
- Atomic absorption spectroscopy
- Scanning electron microscopy
- Data processing skills with MS Excel

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

Dean, J.R., Reed, R., Holmes, D., Jones, A.M. & Weyers, J.D.B. (2017), *Practical Skills in Chemistry*, United Kingdom: Pearson Education Limited.

Other indicative reading

Lobban C.S. & Scheffer M. (2017), *Writing Undergraduate Lab Reports: A Guide for Students*, Cambridge: Cambridge University Press.

Wolstenholme, R., Forbes, S. & Jickells, S. (2021), *Analytical Techniques in Forensic Science*, United Kingdom: Wiley.

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

Core Attributes

Engaged
Creative

Key Attitudes

Commitment
Curiosity
Resilience
Confidence
Adaptability

Practical Skillsets

Digital Fluency
Organisation
Leadership and Team working
Critical Thinking
Emotional Intelligence
Communication