Module specification

When printed this becomes an uncontrolled document. Please access the Module Directory for the most up to date version by clicking on the following link: Module directory

Refer to the module guidance notes for completion of each section of the specification.

Module code	SCI545
Module title	Analytical Methods in Applied Science
Level	5
Credit value	20
Faculty	FAST
Module Leader	Dr Jixin Yang
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	Core
BSc (Hons) Biochemistry	Core

Pre-requisites

None

Breakdown of module hours

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

For office use only	
Initial approval date	14/10/2020

For office use only	
With effect from date	01/09/2021
Date and details of revision	18/3/21 APSC approved to replace previous version (SCI523) in BSc Forensic Science programme
Version number	2

Module aims

This module will introduce students to the main techniques used for the isolation and chemical analysis of trace materials, including general chemical separation and analysis, chromatographic methods, immunoassay and electrophoresis *etc*., with the case studies to demonstrate their applications in forensic and biochemical fields.

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

1	Explain the principles of common chemical analyses and separation techniques.
2	Compare and contrast different chromatographic methods used in trace analysis.
3	Apply the knowledge in chemical analysis and calculation skills in problem solving in forensic and biochemical sciences.
4	Evaluate the importance of chemical analysis in forensic and biochemical sciences.

Assessment

Indicative Assessment Tasks:

Assessment 1: Exam (unseen, 2 hours) containing multiple choice, short-answer and problem-solving questions (50%) occurs at the end of semester. This will focus on the fundamental knowledge and principles in analytical chemistry.

Assessment 2: Coursework of approximately 10 short-answer and problem-solving questions (50%, word count ~ 1,000), focusing on the applications of analytical chemistry. This will be issued near the end of semester.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1 & 2	Examinations	50%
2	3 & 4	Coursework	50%

Derogations

N/A

Learning and Teaching Strategies

Methods of delivery:
- Lectures
- Problem solving workshops
- Directed study *via* Moodle VLE
- Student directed study

The basic factual material will be delivered by means of lectures. Lectures will be supported by workshops in which the students will be able to test their knowledge and understanding of the concepts covered. Students will further be able to develop their knowledge and understanding by reading additional course material and attempting problem sets and quizzes on Moodle VLE. Independent student-directed learning will enable students to delve more deeply into the subject material, enhancing their learning, while developing their IT skills.

Indicative Syllabus Outline

- Introduction to analytical chemistry
- Gravimetric analysis
- Volumetric analysis
- Extraction of trace materials
- Concentration of analytes
- Fundamental principles of chromatography
- Methods of chromatography, including TLC, HLPC and GC
- Fundamental principles of electrophoresis
- Gel electrophoresis and the separation of biomolecules
- Immunochemical methods
- Analytical methods specific to colorant materials such as dyes, inks and paints
- Chemical analysis of polymers, such as hair and fibres
- Case studies to demonstrate the applications of all chemical separation and analysis techniques in forensic and biochemical fields

Indicative Bibliography:

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

Essential Reads
Higson, S.P.J. (2003). *Analytical Chemistry.* Oxford: Oxford University Press.

Other indicative reading
Bell, S. (2012). *Forensic Chemistry.* 2nd ed. Harlow: Pearson.

Rubinson, J.F. and Rubinson, K.A. (2000). *Contemporary Instrumental Analysis.* Upper Saddle River, NJ: PrenticeHall.

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. Click here to read more about the Glyndwr Graduate attributes

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