



Module Specification

Instrumental Analytical Science

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Part 1: Information

Module title: Instrumental Analytical Science

Module code: USSKB9-15-2

Level: Level 5

For implementation from: 2024-25

UWE credit rating: 15

ECTS credit rating: 7.5

College: College of Health, Science & Society

School: CHSS School of Applied Sciences

Partner institutions: None

Field: Applied Sciences

Module type: Module

Pre-requisites: Chemistry in Context 2024-25, Scientific Skills 2024-25

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module provides knowledge and practical experience of analytical chemistry, which underpins higher level study or employment in the field.

Features: Not applicable

Educational aims: This module aims to develop knowledge and practical skills in the applications and limitations of core analytical chemical instrumentation.

Outline syllabus: Choice of analytical method:

Factors in the choice of analytical methods; precision and accuracy and the use of reference materials. Treatment of samples including pre-treatment, use of internal standards and matrix matching.

Chromatographic Methods:

Instrumentation for gas and high performance liquid chromatography. Sample introduction, including pyrolysis-GC and headspace analysis. Modes of separation-types of column, detectors. Applications in forensic and pharmaceutical science.

Mass spectrometry:

The theoretical basis of GC and HPLC-MS including tandem techniques and their application in forensic science. Interpretation of spectra, including the use of libraries and databases.

Voltammetry:

The theory of cyclic and stripping voltammetry and their forensic and broader applications. Practical cyclic voltammetry including selection of instrumental parameters.

Spectroscopy:

Principles and applications of UV, IR and Raman spectroscopy. Sample preparation methods. Applications in forensic and pharmaceutical science.

Part 3: Teaching and learning methods

Teaching and learning methods: The module is delivered through a mixture of interactive lectures and practical classes.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Demonstrate theoretical knowledge of key analytical methods through justified selection of sample processing, instrumentation and associated parameters.

MO2 Evidence practical skills in the preparation and laboratory analysis of samples relevant to analytical chemistry with adherence to safe working practices.

MO3 Communicate results of instrumental analyses to a scientific audience in a written format.

MO4 Quantitatively process data produced from a range of analytical instrumentation and explain results with reference to underpinning scientific principles.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/modules/usskb9-15-2.html) via the following link <https://uwe.rl.talis.com/modules/usskb9-15-2.html>

Part 4: Assessment

Assessment strategy: Assessment 1 is a Report.

This assessment (3000 words) will involve the submission of two practical reports chosen from the suite of practical classes that students will perform. Marks will be allocated for researching the background of the practical, for the experimental results obtained, for the discussion of these results, and for answering questions at the end of the report.

Opportunities exist for formative assessment in practical work that is not given in for marking.

Assessment tasks:

Report (First Sit)

Description: Practical reports

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Report (Resit)

Description: Practical reports

Weighting: 100 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Forensic Science [Frenchay] BSc (Hons) 2023-24

Forensic Science [Frenchay] MSci 2023-24

Forensic Science {Foundation} [Frenchay] BSc (Hons) 2022-23

Forensic Science {Foundation} [Frenchay] MSci 2022-23