Programme Specification

Forensic Science [Frenchay]

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Section 1: Key Programme Details

Part A: Programme Information

Programme title: Forensic Science [Frenchay]

Highest award: BSc (Hons) Forensic Science

Interim award: BSc Forensic Science

Interim award: DipHE Forensic Science

Interim award: CertHE Forensic Science

Awarding institution: UWE Bristol

Teaching institutions: UWE Bristol

Study abroad: No

Year abroad: No

Sandwich year: Yes

Credit recognition: No

School responsible for the programme: CHSS School of Applied Sciences, College of Health, Science & Society

Professional, statutory or regulatory bodies:

Chartered Society of Forensic Sciences (CSFC)

Modes of delivery: Full-time, Sandwich

Entry requirements: For the current entry requirements see the UWE public website.

For implementation from: 01 September 2024

Programme code: F41000

Section 2: Programme Overview, Aims and Learning Outcomes

Part A: Programme Overview, Aims and Learning Outcomes

Overview: The BSc (Hons) Forensic Science programme provides an opportunity for students to explore the theory and practice of forensic science. In addition to offering the basis of vocational careers in forensic science, this programme provides a wider base of scientific skills, together with important generic graduate skills, particularly in an analytical approach to problems. Students may select optional modules in Year 2 and in the final year of the programme to specialise in either Chemistry or Biology.

Features of the programme: The Forensic Science programme is accredited by the Chartered Society of Forensic Sciences in three component standards- Crime Scene Investigation, Laboratory Analysis, and Interpretation, Evaluation and Presentation of Evidence.

The Forensic Science programme is characterised by a significant practical component. All students have the opportunity to benefit from using a wide range of specialist instrumental technology to enhance their learning and practical skills development. Our well-equipped laboratories were commended by the (then) Forensic Science Society in 2011 and again in 2013 and were also commented upon positively by our External Examiner Brian Rankin, during his January 2014 visit.

Students are assessed in a variety of assessment formats, in keeping with the diversity of module learning outcomes. Our external examiners have commented that ‘coursework assessments provide interest and challenge across a broad range of learning outcomes’ and that ‘the use of context based teaching, learning and assessment tasks is motivational as well as relevant to the development of professional knowledge and skills’.

In addition to our crime scene facility, training in crime scene investigation; laboratory analysis and court presentation is aided by the use of Second Life as a VLE. A number of crime scenes have been built in Second Life for use with this degree programme and students will first access these in synchronous sessions with

staff, and later be able to use as much as desired to practise and enhance their learning.

There is opportunity to apply to study level 5 at Virginia Commonwealth University (VCU).

Following an HE STEM project, an exercise is run which brings students into direct contact with employers in the fields of DNA analysis and analytical chemistry.

Educational Aims: The forensic team aims to create a friendly and supportive atmosphere that will support individual students to use the learning experience at UWE to create a graduate foundation, on which they can develop their future careers and on-going social and educational development.

To this end a programme has been designed which will enable students to:

study the breadth of forensic science from scenes of crime issues to courtroom presentations, and relevant topics in the related fields of molecular biology, analytical chemistry and law.

be confident in the theory and practical application of a wide range of technologies for experimental and data analysis relevant to forensic science and more broadly the fields of chemistry and biology.

be ready and able to contribute positively to society as graduate level employees. Embedded skills reviews, credited employment, and assessments in which students take on the role of forensic professionals are key enablers in the achievement of this aim.

be lifelong, reflective learners who understand the roles and responsibilities of scientists in society.

engage in constructive, critical analysis.

In addition to the above, the International variant of this programme provides the opportunity for study abroad with general and specific benefits. The experience of a different educational as well as social culture and the contacts made with professionals in another country are of great potential value to students. The UK and the USA are two of the countries using the most advanced technology in Forensic Science, and the complementary specialist expertise of academics at VCU to those at UWE provide additional educational benefit to students on this programme.

Programme Learning Outcomes:

On successful completion of this programme graduates will achieve the following learning outcomes.

Knowledge and Understanding

A1. The scope and nature of scientific evidence, its value to society and the roles and responsibilities of forensic scientists.

A2. The techniques used in crime scene investigation.

A3. The theory and application of the principal laboratory methods used routinely in forensic science.

A4. Principles and procedures relating to the interpretation, evaluation and presentation of evidence.

A5. Wider aspects of science associated with forensic science and studies, especially Biology and Chemistry.

A6. Methodology of scientific inquiry and research.

A7. The range of techniques used for the extraction and analysis of DNA.

A8. The principles and procedures used in chemical analysis and the characterisation of chemical compounds.

A9. The facts, principles, practices and applications of organic, inorganic and physical chemistry.

A10. The explanation of biological phenomena at a variety of levels from biological molecules to whole organisms.

A11. Gene expression, with detailed knowledge of specific examples.

A12. Human physiology, pathology, disease and pharmacology.

Intellectual Skills

B1. Select appropriate strategies, techniques and procedures for the examination of a scene of crime.

B2. Select appropriate strategies, techniques and procedures for the examination of forensic evidence.

B3. Interpret and evaluate evidence and report on it appropriately.

B4. Recognise and apply subject-specific theories, paradigms, concepts or principles.

B5. Critically analyse, synthesise and summarise information, including published research or reports, and use several lines of information to form and test hypotheses.

B6. Recognise the moral and ethical issues of investigations and appreciating the need for ethical standards and professional codes of conduct.

B7. Recognise and implement good measurement science and practice.

Subject/Professional Practice Skills

C1. Plan and safely execute scientific investigations, including a programme of independent research.

C2. Obtain, record, collate and critically analyse data using appropriate techniques in the field and/or laboratory.

C3. Handle, analyse and report forensic samples with awareness of validity and contamination issues.

C4. Communicate results and their interpretation clearly and unambiguously.

C5. Synthesise a variety of appropriate skills to meet the requirements of forensic analysis.

C6. Adhere to safe working practices.

C7. Comply with ethical, legal and quality assurance principles such as the chain of custody.

C8. Conduct standard laboratory procedures for synthetic and analytical work and competently operate standard equipment.

Transferable Skills and other attributes

D1. Evaluate their own academic performance and plan work accordingly.

D2. Study independently in a variety of learning styles.

D3. Work effectively as a team member.

D4. Practise good time management, prioritise workloads and recognise deadlines.

D5. Communicate effectively in a variety of media and contexts; in particular, express the interpretation of results in a manner comprehensible to the intended recipient and write comprehensive, comprehensible, rational and impartial reports.

D6. Use mathematical and statistical methods effectively in problem solving.

D7. Use a variety of IT skills for data processing, communicating and supporting scientific research.

Assessment strategy: Assessments throughout the programme enable students to acquire the necessary knowledge, understanding and skills outlined in the learning outcomes of the programme.

An “assessment for learning” strategy has been adopted, where assessment is used as a tool to enable students to reach learning outcomes, which they have not yet met. This often takes the form of formative and summative assessments which explicitly feed forward into future assignments or between levels. Tasks are built upon between levels and the assessment journey is made clear to students through guidance documentation. One example is the development of practical forensic science skills in the programme: Students are assessed on processing of basic crime scenes and crime scene skills at level 4 in Scientific Investigation of Crime; investigate more unusual scenes and undertake guided laboratory examinations at level 5 in Forensic Analysis and independently process scenes, analyse evidence and produce reports for court at level 6 in Interpretation of Forensic Evidence. At level 6 students undertake a variety of real world forensic professional roles, their performance in each forming the basis of coursework assessment.

Considerable emphasis is given to the assessment of learning undertaken in the practical laboratory and crime scene facilities, as well as critical evaluation, and communication in a range of formats including reports for court and courtroom assessment of the oral presentation of evidence, including cross-examination.

The syllabus and assessment of Scientific Skills module (level 4); and Forensic Analysis (level 5) include activities such as skills evaluation, reflections on academic and extra-curricular achievements, action planning and work integrated learning.

In 2013 External Examiner Lee Banting commented that “UWE and UCY have an extremely sound and broad assessment strategy. A range of assessment examines a wide range of subject specific and academic skills necessary for a fully functional graduate”.

Typically at level 4 the coursework contributes 60% of the module mark and written exams, including multiple-choice questions, contribute 40%. At level 5 the written exams typically contribute 50% with coursework 50% and at level 6 most modules have 60% of the module mark derived from written exams and 40% from a range of demanding coursework. Core forensic modules, with a strong emphasis on practice orientated coursework assessment have a 50:50 split at level 6, in recognition of the importance and complexity of these activities.

Student support: Forensic Science Society. The latter has hosted national conferences, workshops and guest lectures as well as regular social events.

At UWE, Bristol there is a policy for a minimum average requirement of 12-hours/week contact time over the course of the full undergraduate programme. This contact time encompasses a range of face-to-face and online activities as described below. In addition a range of other learning activities will be embedded within the programme, which, together with the contact time, will enable learning outcomes to be achieved and demonstrated.

On the Forensic Science programmes teaching is a mix of scheduled and

independent learning. Skills for independent and lifelong learning are incorporated into the Skills for Science, Scientific Skills, Forensic Analysis and Project modules.

Scheduled learning includes lectures, practical classes, subject specific tutorials, academic support tutorials, project supervision and workshops. Scheduled sessions may vary slightly depending on the module choices made. Students will also receive interactive online material and lectures.

Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc.

Part B: Programme Structure

Year 1

Full time and sandwich students must take 120 credits from the modules in Year 1.

Year 1 Compulsory Modules (Full Time and Sandwich)

Full time and sandwich students must take 120 credits from the modules in Compulsory Modules (Full Time and Sandwich).

Module Code	Module Title	Credit
USSJRT-30-1	Chemistry in Context 2023-24	30
USSJRU-30-1	Human Biological Systems 2023-24	30
USSJRV-30-1	Scientific Investigation of Crime 2023-24	30
USSJRW-30-1	Scientific Skills 2023-24	30

Year 2

Full time and sandwich students must take 120 credits from the modules in Year 2.

Year 2 Compulsory Modules (Full Time and Sandwich)

Full time and sandwich students must take 90 credits from the modules in Compulsory Modules (Full Time and Sandwich).

Module Code	Module Title	Credit

USSKAV-30-2	Drugs and Toxicology 2024-25	30
USSKAU-30-2	Forensic Analysis 2024-25	30
USSUJD-30-2	Law and Expert Evidence 2024-25	30

Year 2 Optional Modules Semester 1 (Full Time and Sandwich)
Full time and sandwich students must take 15 credits from the modules in Optional Modules Semester 1 (Full Time and Sandwich).

Module Code	Module Title	Credit
USSKB8-15-2	Forensic Biology 2024-25	15
USSKB9-15-2	Instrumental Analytical Science 2024-25	15

Year 2 Optional Modules Semester 2 (Full Time and Sandwich)
Full time and sandwich students must take 15 credits from the modules in Optional Modules Semester 2 (Full Time and Sandwich).

Module Code	Module Title	Credit
USSKFQ-15-2	Genetics 2024-25	15
USSKB5-15-2	Medicinal Chemistry 2024-25	15

Year 3
Full time students must take 120 credits from the modules in Year 3.
Sandwich students must take 15 credits from the modules in Year 3.

Sandwich students elect to spend a year out working for an organisation, in an appropriate placement to gain relevant work experience. Professional Services will support students in this endeavour. Credit is achieved through the USSK57-15-3 Professional Practices in Applied Sciences module.

Year 3 Compulsory Modules (Full Time)
Full time students must take 60 credits from the modules in Compulsory Modules (Full Time).

Module Code	Module Title	Credit
USSJKW-30-3	Crime Scene to Court 2025-26	30

USSKBC-30-3	Research Dissertation Project 2025-26	30

Year 3 Compulsory Modules (Sandwich)
Sandwich students must take 15 credits from the modules in Compulsory Modules (Sandwich).

Module Code	Module Title	Credit
USSK57-15-3	Professional Practice in Applied Sciences 2025-26	15

Year 3 Compulsory Modules (Full Time)
Full time students must take 30 credits from the modules in Compulsory Modules (Full Time).

Module Code	Module Title	Credit
USSJUR-30-3	Forensic Analysis and Toxicology 2025-26	30
USSJUP-30-3	Forensic Biology and Genetics 2025-26	30

Year 3 Optional Modules Group A (Full Time)
Full time students must take 15 credits from the modules in Optional Modules Group A (Full Time).

Module Code	Module Title	Credit
USPKCH-15-3	Forensic Psychology 2025-26	15
USSKBW-15-3	Pathophysiology 2025-26	15
USSKBX-15-3	Pharmacology and Toxicology 2025-26	15

Year 3 Optional Modules Group B (Full Time)
Full time students must take 15 credits from the modules in Optional Modules Group B (Full Time).

Module Code	Module Title	Credit
USSKCD-15-3	Environmental Forensics 2025-26	15

USSKCA-15-3	Neuroscience and Neuropharmacology 2025-26	15
USSKCE-15-3	Science Communication 2025-26	15

Year 4
Sandwich students must take 105 credits from the modules in Year 4.

Year 4 Compulsory Modules (Sandwich)
Sandwich students must take 60 credits from the modules in Compulsory Modules (Sandwich).

Module Code	Module Title	Credit
USSJKW-30-3	Crime Scene to Court 2026-27	30
USSKBC-30-3	Research Dissertation Project 2026-27	30

Year 4 Compulsory Modules - Pathway Selection (Sandwich)
Sandwich students must take 30 credits from the modules in Compulsory Modules - Pathway Selection (Sandwich). Pathway availability will depend on the pathway selection made at Level 5.

Students who selected the General pathway may select either Forensic Biology and Genetics USSJUP-30-3 OR Forensic Analysis and Toxicology USSJUR-30-3.
Students who selected the Biology pathway must select Forensic Biology and Genetics USSJUP-30-3.
Students who selected the Chemistry pathway must select Forensic Analysis and Toxicology USSJUR-30-3.

Year 4 Compulsory Modules - Pathway Selection (Sandwich) Compulsory Module Group A: Biology pathway
Students must have selected Group A: General Pathway or Group B: Biology Pathway at Level 5 to study USSJUP-30-3 at Level 6.

Module Code	Module Title	Credit
USSJUP-30-3	Forensic Biology and Genetics 2026-27	30

Year 4 Compulsory Modules - Pathway Selection (Sandwich) Compulsory Module Group B: Chemistry pathway
Students must have selected Group A: General Pathway or Group C: Chemistry Pathway to study USSJUR-30-3 at Level 6.

Module Code	Module Title	Credit
USSJUR-30-3	Forensic Analysis and Toxicology 2026-27	30

Year 4 Optional Modules (Sandwich)
Sandwich students must take 15 credits from the modules in Optional Modules (Sandwich).

Module Code	Module Title	Credit
USSYXN-15-3	Advanced Crime Scene Science 2026-27	15
USSYXM-15-3	Excavation and Examination of Human Remains 2026-27	15
USSKCD-15-3	Environmental Forensics 2026-27	15
USPKCH-15-3	Foundations of Forensic Psychology 2026-27	15
USSKBX-15-3	Pharmacology and Toxicology 2026-27	15
USSKCE-15-3	Science Communication 2026-27	15

Part C: Higher Education Achievement Record (HEAR) Synopsis

Successful graduates will have a strong foundation of Biology, Chemistry, Statistics, Crime Scene Skills and legal aspects of forensic evidence and will benefit from using specialist forensic and chemical instrumentation. Graduates will have carried out investigations of mock indoor, outdoor and vehicle crime scenes and taken a mock case from 'crime scene to court'. This requires excellent analytical, communication and time management skills. Graduates will have undertaken an independent research project in an area related to forensic science. They will have experience in

the qualitative and quantitative interpretation of scientific results and numerical data, a vital part of forensic science.

Part D: External Reference Points and Benchmarks

Requirements of Professional Bodies

The Chartered Society of Forensic Sciences is the professional body which operates an accreditation scheme for university courses in forensic science, and this course has been accredited (UWE being one of the first four universities to have been recognised in this way) in all three main component standards – (1) Crime Scene Investigation, (2) Laboratory Analysis and (3) Interpretation, Evaluation, and Presentation of Evidence. Students may join The Chartered Society of Forensic Sciences as student members. Graduates who have undertaken chemistry focussed modules at levels 5 and 6 may apply to become Associate Members of the Royal Society of Chemistry. Graduates who have undertaken a Biology focused modules at levels 5 and 6 may apply to become Associate Members of the Society of Biology.

The programme team had a successful surveillance visit from the Chartered Society of Forensic Sciences in December 2015, and we obtained two extra commendations; for our work in crime scene investigations in virtual worlds and for achieving certified status as an assessment centre for the Chartered Society's Pre-Employment Assessment of Competence. We have also updated our teaching to cover minor omissions identified on review of the QAA Forensic Science benchmark statement and have improved our research profile and technology enhanced learning through new collaborations (Knowledge Transfer Partnership Research Project linked to industry) and projects (development of 'virtual' crime scenes for teaching and learning). We have also updated to reflect current professional practice e.g. incorporation of Streamlined Forensic Reporting in our teaching and assessment. These factors give the team confidence in the quality and appropriateness of the current versions of the programmes.

A Strategic Employers Group incorporating members of the Police Service and local and national forensic providers informs course developments. UWE Forensic Sciences also participate in a STEM (a national Science, Technology, Engineering

and Mathematics group) employment project, an initiative that brings students into direct dialogue with employers in the areas of DNA and chemical analysis. Students are further assisted in obtaining employment by the UWE Careers Service and the specialist academic support they receive during the employability focused level 5 tutor group system.

Qualification descriptors used in the QAA Framework for Higher Education Qualifications

The learning outcomes for the programme have been developed with reference to the qualification descriptors used in the QAA Framework for Higher Education Qualifications. In particular, the learning outcomes for modules at level one and level two have been considered to be consistent with the award of a Certificate in Higher Education and a Diploma in Higher Education respectively. Graduates of the award achieving an Honours classification will develop an understanding of a complex body of knowledge related to forensic science. In addition, the graduate will develop skills in analytical techniques, problem-solving skills and communication skills that can be applied to a range of employment opportunities.

Subject benchmark statements

Owing to its interdisciplinary nature, this programme draws on several subject benchmark statements for guidance.

Forensic Science Benchmarking

The specific requirements for forensic science have been informed by the knowledge and experience of staff who have been trained, and are professionally active, in this rapidly developing field. Benchmarking for forensic science has however been derived from the accreditation standards of the Chartered Society of Forensic Sciences in addition to the QAA benchmark for Forensic Science, which the programme team were consulted on the development of and which aligns closely with this programme specification. Elements of the chemistry and bioscience benchmarks are relevant for the analytical aspects of forensic science.

Chemistry Benchmarking

As chemistry only forms part of the programme, only some of the main aims of chemistry benchmarking are relevant:

To develop in students the ability to apply their chemical knowledge and skills to the solution of (theoretical and) practical problems in chemistry.

To develop in students, through an education in chemistry, a range of transferable skills, of value in chemical and non-chemical employment.

The focus of this programme is on the practical application of chemistry to forensic science, and hence does not develop the same depth of theoretical understanding as a full chemistry course.

Likewise this programme covers a sub-set of the subject knowledge expected of a chemistry degree:

Major aspects of chemical terminology, nomenclature, conventions and units.

The principles and procedures used in chemical analysis and the characterisation of chemical compounds.

The principal techniques of structural investigations, including spectroscopy.

The nature and behaviour of functional groups in organic molecules.

Most of the abilities and skills, chemistry-related practical skills and transferable skills, identified by the Quality Assurance Agency for Higher Education for chemistry are equivalent to the Subject/Professional/Practical and Transferable Skills that define this programme.

Bioscience Benchmarking

Bioscience benchmarking for subject knowledge adopts more inclusive statements implying a broad knowledge across the whole subject, which does not mirror the more focused and practical approach in this programme. The programme draws on the following statements:

…together with specialised in-depth study (often career-related) of some aspects of the discipline or subject area. …….

understanding of information and data, and their setting within a theoretical framework…….;

Familiarity with the terminology, nomenclature and classification systems as appropriate;

Methods of acquiring, interpreting and analysing biological information with a critical understanding of the appropriate contexts ……

Knowledge of a range of practical and presentational techniques and methodologies relevant to the particular discipline, including data analysis and the use of statistics.

The generic, intellectual, and practical skills, that are not strongly subject-dependent, also map well to the Intellectual Skills and Subject/Professional/Practical Skills of this programme, e.g.

The capacity to give a clear and accurate account of a subject, marshal arguments in a mature way and engage in debate and dialogue both with specialists and non-specialists;

The ability to employ a variety of methods of study in investigating, recording and analysing material.

University's Mission Statement

The programme has been refreshed to align fully with the UWE Bristol Strategy 2020. Examples are given in this document of good practice in learning and teaching, techniques to prepare graduates for employment or further study, of how research informs teaching and how students and staff benefit from our partnerships.

University's learning and teaching policies

In line with the University's teaching and learning policies, this programme takes a student centred approach to learning by allowing students to take control of aspects of their learning and providing a learning environment that stimulates active participation and engagement in the learning process. The programme seeks to create an environment that will stimulate students to take responsibility for aspects of their learning, while lecturers take responsibility for facilitating that learning. Module learning outcomes have been designed to ensure that students meet the overall programme learning outcomes on completion of the programme. In addition, the FACS (Forensic, Chemical and Analytical Science) section of the Faculty has been active in developing and strengthening the key skills aspects of the programmes.

A variety of assessment methods is incorporated within the programme to cater for a diversity of student strengths and abilities. Although this document focuses on summative assessment, the course team recognise the importance of both summative and formative assessment activity as an integral part of the learning and teaching process. All assessments will comply with the University Assessment Policy and Academic Regulations.

Research carried out by staff

Teaching is delivered by a team of very knowledgeable and enthusiastic staff with a wide-range of expertise and practitioner experience, including world-leading researchers in biosciences and analytical chemistry who lead both modules and research projects on the forensic science programmes. Research is undertaken in the following areas of particular impact on forensic science:

Optimisation of VMD as a technique for the development of fingermarks on difficult

substrates and identification of sources of touch DNA for use in forensic casework (Knowledge Transfer Partnership project with industry).

chemical sensors for drugs and arson accelerants

improvements of MSMS methods used in the detection of illicit drugs

forensic entomolog

factors affecting the efficacy of fingermark development methods

elemental composition of soil

Some projects are carried out with regional forensic science companies or police forces.

Research in forensic science topics is also supported by a wide range of other research interests across the fields of biology and chemistry.

Using the world-class research facilities of the Centre for Research in Biosciences, the bioscience research is excellent and of international standard. Current research projects include

Genomics research into molecular diagnostic methods for non-invasive prenatal diagnosis

Neuroscience: the function of the blood-brain barrier

In vitro toxicology

Cancer and ageing

Red cell membrane molecular biology and red cell antigen expression

Magnetic detection systems for biological interactions.

The department has excellent links with the forensic science practitioners in the area. The Avon and Somerset Constabulary are very supportive of the forensic science teaching at UWE, and collaborate for research projects. Local Home Office Forensic Pathologists have also been involved with the faculty for many years - one is involved in teaching the level 6 compulsory forensic science module.

A local independent laboratory has research links with the Forensic Science team at UWE.

There is a Strategic Employers Group for the Forensic Analytical and Chemical Sciences subject group and local employers discuss with the programme team how to ensure that the curriculum is current and appropriate. Current students and graduates also provide feedback and suggestions for improving the quality and standards of learning.

Part E: Regulations

Approved to University Regulations and Procedures.