QAA

Subject benchmark statement

Forensic science
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Preface

Subject benchmark statements provide a means for the academic community to describe the nature and characteristics of programmes in a specific subject or subject area. They also represent general expectations about standards for the award of qualifications at a given level in terms of the attributes and capabilities that those possessing qualifications should have demonstrated. Subject benchmark statements form part of the UK Quality Code for Higher Education.[1]

This subject benchmark statement refers to **bachelor's degrees with honours[2] and master's degrees in forensic science**.[3]

Subject benchmark statements are used for a variety of purposes. Primarily, they are an important external source of reference for higher education providers when new programmes are being designed and developed in a subject area. They provide general guidance for articulating the learning outcomes associated with the programme, but are not specifications of a detailed curriculum in the subject.

Subject benchmark statements also provide support to higher education providers in pursuit of internal quality assurance. They enable the learning outcomes specified for a particular programme to be reviewed and evaluated against agreed general expectations about standards.

Subject benchmark statements allow for flexibility and innovation in programme design and can stimulate academic discussion and debate upon the content of new and existing programmes within an agreed overall framework.

Subject benchmark statements may also be of interest to prospective students and employers seeking information about the nature and standards of awards in a given subject or subject area.

The relationship between the standards set out in individual subject benchmark statements and the requirements of professional, statutory or regulatory bodies will be a matter for individual higher education providers to consider in detail.

This subject benchmark statement was produced by a group of subject specialists drawn from and acting on behalf of the subject community. The process was overseen by the Quality Assurance Agency for Higher Education (QAA). This subject benchmark statement will be revised no later than five years from its publication date, to reflect developments in the subject area and the experiences of higher education providers and others who have been working with it. The review process will be overseen by QAA in collaboration with the subject community.

QAA publishes and distributes this subject benchmark statement and other subject benchmark statements developed by similar subject-specific groups.

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[1] Further information about the UK Quality Code for Higher Education is available from www.qaa.ac.uk/qualitycode.

[2] Level 6 in *The framework for higher education qualifications in England, Wales and Northern Ireland* (2008) and level 10 in the *Scottish Credit and Qualifications Framework* (2001).

[3] Level 7 in *The framework for higher education qualifications in England, Wales and Northern Ireland* (2008) and level 11 in the *Scottish Credit and Qualifications Framework* (2001).

The Equality Act 2010 brings together and extends previous equality legislation for England, Scotland and Wales.[4] The legislation introduced protected characteristics for which discrimination is unlawful and covers employment, education, the provision of goods, facilities and services, the management of premises and the exercise of public functions.

The public sector Equality Duty, which came into force on 5 April 2011, requires public bodies to have due regard to the need to eliminate discrimination, advance equality of opportunity, and foster good relations between different people when carrying out their activities.[5]

Higher education providers are responsible for ensuring they meet any legal requirements. Further information and guidance on the implementation of the Equality Act is available from the Equality Challenge Unit[6] and the Equality and Human Rights Commission.[7]

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[4] Separate anti-discrimination law applies in Northern Ireland. Further information is available from www.ecu.ac.uk/publications/anti-discrimination-law-in-northern-ireland.

[5] http://homeoffice.gov.uk/equalities/equality-act/equality-duty/.

[6] Equality Challenge Unit: www.ecu.ac.uk; see particularly www.ecu.ac.uk/law/equality-act.

[7] Equality and Human Rights Commission: www.equalityhumanrights.com.

Foreword

It is with much pleasure that I write this foreword. I feel that we, as the benchmark group, have set a standard that can be used to great effect in the assurance of degree courses in forensic science. The new subject benchmark statement should help to harmonise and add some cohesion to existing provision. The group responsible for its development has also tried to ensure that the standards reflect the needs of those who employ forensic science graduates.

The development of the benchmark statement follows reports by a Home Office Select Committee, Skills for Justice and the Higher Education Academy, and a submission by the UK Forensic Science Education Group to QAA to establish a new benchmark.

This subject benchmark statement is firmly based in science and therefore has drawn on other benchmark statements for science subjects, such as chemistry and biosciences. We have focused on learning outcomes, rather than a repetition of content or curricula from other science subjects.

The benchmarking group has worked hard to capture the unique and distinctive nature of forensic science, its setting within the investigative process as an academic subject, and its application for a forensic practitioner. The knowledge and transferable skills developed in a forensic science degree course are also valuable preparation for many other careers.

The benchmarking group was constituted from representatives from the academic community and providers offering forensic science services (both in-house police services and commercial forensic science providers), professional and learned bodies, as well as those delivering training. The group was constituted with employers, as well as higher education providers, in mind. An important part of the development of the new statement was the circulation of a draft version of the statement to the wider community for comment, as part of a sector-wide consultation.

The benchmarking group reiterates QAA's intention for all subject benchmark statements that they provide a flexible framework that will permit innovation and diversity in course design and continual development in teaching and learning. It was definitely not the intention of the group that the benchmark statement should deliver a prescriptive core curriculum or set core competencies.

The benchmarking group has also taken the opportunity to incorporate standards for master's degrees alongside the bachelor's degree with honours within the new benchmark statement.

I commend the diligence, motivation and commitment of the group in ensuring a benchmark statement that I believe is contemporary, fit for purpose and user-friendly for academics, employers, practitioners and students. A special word of thanks to Mike Edmunds who undertook the writing of the statement on behalf of the group - his immense experience served to maintain an efficient and effective process to deliver the benchmark to plan and on time.

December 2012

Brian W J Rankin
Chair of the benchmarking group
UK Forensic Science Education Group
Chair of Standards, the Forensic Science Society
Head of Centre for Forensic Investigation, Teesside University

1 Introduction

1.1 This statement sets out academic standards for bachelor's degrees with honours and for master's degrees (including integrated master's) in forensic science. Forensic science is defined in section 2.1.

1.2 This statement also defines the forensic science aspects of degree programmes which are primarily based in areas with established benchmarks, such as 'Chemistry with Forensic Science' or 'Forensic Chemistry'.

1.3 Forensic science practitioners are required to adhere to professional standards. Course providers should take these standards into account when developing learning outcomes, and degree schemes will benefit from continuing engagement with employers to keep pace with advances in the area. The relevant National Occupational Standards, together with accreditation of degree schemes by the professional body, The Forensic Science Society, are signposted in section 8.

1.4 As well as being a preparation for direct employment in forensic and forensic-related areas, forensic science degrees provide an option for students with a general interest in science but who also wish to keep other employment options open. Forensic science degree programmes will share certain aspects of their curricula and content with other science degrees and should provide a sound grounding in scientific knowledge sufficient for professional work in forensic science. The degree programmes should also develop students' critical thinking and investigative, analytic and laboratory skills, as well as other personal transferable skills.

1.5 Higher education providers seeking external recognition for degree programmes may wish to consult additional points of reference, which are signposted in section 8.

1.6 The Forensic Science Society’s Component Standards for recognising and accrediting degree programmes are reflected in the areas of subject knowledge and understanding (section 4) and benchmark standards (section 7).

2 Nature and extent of forensic science

2.1 Forensic science is defined here as the application of science to serve the purposes of the law.

2.2 Degree schemes involving forensic science and closely related subjects are, at the time of writing, delivered at over 40 higher education institutions in the UK.

2.3 Principal employers of forensic scientists include organisations comprising the justice system, such as the police, law enforcement agencies and forensic science providers, and governmental agencies. Forensic science graduates are also well equipped to use their scientific knowledge and skills, particularly laboratory skills, in a wide variety of alternative employment areas.

2.4 The sciences used in the analysis of physical evidence include many aspects of chemistry, biology, physics, mathematics and statistics. This multidisciplinary nature is a core feature of forensic science and, accordingly, of the benchmark standard set out in this statement.

2.5 A forensic science practitioner requires knowledge of relevant areas of the law and of the relevant jurisdictional law enforcement procedures of the legal system. It is within this context (both civil and criminal) that the recognition, enhancement, preservation, recovery, scientific analysis, interpretation, evaluation and presentation of evidence takes place.

2.6 In addition to a knowledge and understanding of the core sciences, there are three integrated components of forensic science that make it unique as a discipline. Practitioners need a familiarity with the investigative processes covering these three key themes, although their activities and depth of expertise may lean towards a particular area. The themes are (i) crime scene investigation, (ii) laboratory analysis and (iii) the evaluation, interpretation and presentation of evidence.

2.7 In scene of crime work, the management, investigation, recording and recovery of evidence - including devices containing digital data - is fundamental to the subsequent laboratory activity and interpretation of that evidence. Many of the skills required are distinct from those used in the laboratory.

2.8 Laboratory work emphasises those techniques employed in the examination, comparison and analysis of chemical and biological materials and, in particular, the choice and use of methods for identifying trace materials with sufficient discrimination for reliable investigative or evidential use.

2.9 Evaluation and interpretation of evidence involves the reliable recording of evidence and experimentation, the management of data and its interpretation. It also requires the clear presentation (written and oral) of the analysis of evidence and an understanding of its validity within a legal context. A report or witness statement must be robust, transparent, logical and unbiased.

2.10 Techniques used in forensic science are likely to change and develop rapidly, often with subsequent implications for preserving the integrity of evidence (for example, digital data). There is a need for practitioners to be aware of and respond to relevant, current and developing research trends in science and technology, and of forensic science as a research discipline.

2.11 In all activities, the highest standards of professional and ethical behaviour are required.

3 Aims of degree programmes in forensic science

3.1 A bachelor's degree with honours in forensic science should aim to enable students to:

- develop an enthusiasm for forensic science and have an intellectually stimulating and beneficial learning experience
- acquire underpinning scientific knowledge and skills of direct relevance to competence as a practitioner in forensic science, and to those organisations concerned principally with the collection or analysis of forensic evidence
- develop a sound knowledge of science and of laboratory and other transferable skills which are of value in areas of employment other than forensic science, such as schools, hospitals, analytical science-based companies, the pharmaceutical industry, the Home Office and other government agencies

- acquire the written and oral communication skills required to present data and explain scientific arguments to specialist and general audiences
- develop independent learning to a level where they are able to build on their knowledge and skills for their own and their potential employer's benefit, and to demonstrate initiative and flexibility with respect to changing needs and techniques; this may be achieved through a structured system of recorded personal development
- develop an appreciation of the importance of the continuity of evidence from the crime scene to the court
- develop a familiarity with the justice system, including those requirements of the police and the legal sector (such as disclosure) relevant to the procedures and practice of forensic science, including a knowledge of the different legal systems and their requirements relating to forensic science within the UK
- develop an awareness of professional and ethical standards and practices (including quality assurance), and the importance of adhering to them
- acquire research skills appropriate to degree-level study, with an appreciation of current and emerging research in forensic science and other relevant areas.

3.2 In addition to the aims outlined in 3.1, a master's degree in forensic science should aim to help students to develop:

- a deep knowledge and experience of techniques relevant to forensic science and their practical application within particular relevant specialisations
- a critical awareness of and engagement with current research methods and techniques
- the abilities and skills necessary to devise, plan, carry out and present an original investigation or research project in an academic context
- a clear recognition of the constraints and opportunities of the environment in which professional forensic science is carried out
- preparedness for entry to professional employment or doctoral level study
- the independent learning ability required for continuing professional development.

3.3 All degree programmes should accord with the qualification descriptions in national qualification frameworks.[8] QAA has published additional guidance on different kinds of master's degrees, which may also be helpful to providers.[9]

4 Subject knowledge and understanding

4.1 A bachelor's degree with honours should include, as core, selected aspects of chemistry, biology, physics, mathematics and statistics.

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[8] *The framework for higher education qualifications in England, Wales and Northern Ireland and the Framework for qualifications of higher education institutions in Scotland* can be found at: www.qaa.ac.uk/publications/informationandguidance/pages/quality-code-A1.aspx.

[10] *Master's degree characteristics* (2010) can be found at: www.qaa.ac.uk/publications/informationandguidance/pages/master's-degree-characteristics.aspx.

4.2 The scientific topics listed in the following sections are central to forensic science, but the list is not intended to be exhaustive.

4.3 In chemistry the emphasis should be on analytical techniques, concerned with the identification of materials and the determination of their composition. The student should appreciate the underlying physical principles and the individual limitations of the techniques, as well as the chemical interactions taking place.

4.4 In biology the programme must include microscopy, and molecular biology and biochemistry (with particular emphasis on nucleic acids, proteins, enzymes and biochemical processes, molecular genetics and principles of inheritance), and may include anatomy, organ systems, some forensic medicine and other areas such as entomology, microbiology, palynology, botany and anthropology.

4.5 In physics the programme should include elementary optics (including principles of microscopy), classical mechanics (as relevant to projectiles, ballistics and explosions), physical properties of matter, elementary electricity and magnetism, and radiation and its effects.

4.6 In mathematics an appropriate basis would be sufficient knowledge and facility in functions, algebra and trigonometry to cover the mathematical aspects of the physics, chemistry and biology in the course. Appropriate statistics would be a working knowledge of the basis and application of statistical methods and probability for analysis of data and their uncertainties, including sampling methods. This should include an understanding and use of databases and frequency data, and use of the Bayesian approach for evaluation and interpretation of evidence.

4.7 Within the three main themes of forensic science outlined in section 2, different degree schemes may have different emphases but a basic knowledge of all three themes is a minimum requirement for all students.

Crime scene investigation:

- knowledge of the principles and effective application of the relevant techniques needed for the formulation of scene examination strategies
- appreciation of the importance of the recognition, processing, recording, preservation, recovery, scientific analysis and interpretation of evidence at the crime scene
- clear understanding of the responsibilities, roles and liabilities of the individuals and agencies involved in a crime scene, and of information exchange between them.

Laboratory examination and analysis:

- knowledge of the theory, application and limitations of the principal laboratory methods used routinely in forensic science • competence in the selection and use of a range of methods used in the location, identification, recovery, examination, comparison, extraction and scientific analysis of commonly encountered physical, chemical and biological materials
- knowledge of the principles and application of control and reference samples, and the use of databases.

Interpretation, evaluation and presentation of evidence:

- ability to manage and interpret evidence and experimental results, including issues of uncertainty
- ability to interpret and communicate forensic evidence in the context of casework
- perception of the requirements for, and development of ability in, the preparation and delivery of impartial, comprehensible oral and written reports in various legal situations
- knowledge of prevailing legal standards and legislation applicable to the recovery, storage, retention, analysis and disposal of evidence.

4.8 Students should acquire a familiarity with the techniques and limitations of common validated forensic science techniques for mark comparison.

4.9 Students should develop a knowledge of the criminal justice and legal systems within the UK, and in particular how forensic science and the role of the expert witness fits into their processes. Students should become aware of the particular requirements of communication within these systems, and of how to articulate appropriately the degree of uncertainty of particular forensic techniques.

4.10 All students must become familiar with professional ethics, including respect for codes of conduct and practice, standards, rules and responsibilities.

5 Skills

5.1 Students studying for forensic science degrees are expected to develop a wide range of skills and abilities. These may be broadly grouped into three areas: (i) basic scientific skills, including laboratory skills, (ii) skills specific to forensic science and (iii) generic graduate skills.

Scientific and laboratory skills

5.2 A bachelor's degree with honours should be designed to enable students to develop the ability to:

- apply scientific methods to tackle problems in science, including how to construct a suitable hypothesis and how to design experiments to test this hypothesis
- evaluate and critically interpret the results of problem solving; this will require the student to identify the appropriate physical principles, plan strategies for solution and present conclusions in suitable textual, tabular or graphical form
- plan, execute, and report the results of a scientific investigation using appropriate methods to critically analyse the data and evaluate the level of its uncertainty
- understand the need to carry out tasks in a consistent and reproducible manner
- work safely and effectively in a laboratory; this includes competent risk assessment, following documented procedures, ensuring calibration, and reliable recording of methods and results
- be confident in using advanced laboratory equipment, and in learning how to use new facilities

- use ITC skills to analyse and organise data, including software appropriate to experimental equipment and use of databases.

5.3 In addition to the abilities above, a master's degree programme should be designed to enable students to:

- apply and adapt problem solving skills to unfamiliar, complex and open-ended situations
- plan and execute new experimental procedures
- plan, carry out and report an independent research project
- work safely and effectively without direct supervision in a laboratory.

Forensic science skills

5.4 A bachelor's degree with honours should be designed to enable students to develop the ability to:

- appreciate why standards and codes of conduct are necessary
- work effectively within a team and within a formalised system, following relevant quality assurance procedures
- undertake the recording, recovery, scientific analysis, evaluation, interpretation, preservation and presentation of evidence
- construct efficient case-examination strategies
- be competent in procedures for maintaining the integrity and continuity of evidence
- use written and oral presentation skills appropriate for the legal, court and law enforcement environments
- comply with safe working practices, both for self and others
- possess an awareness of the special issues, legal framework and practices involved with the recovery, storage, handling, retention, investigation, analysis and disposal of various contact trace materials, including human or other biological tissues and DNA
- possess an awareness of the implications of modern technological advances, including databases and digital forensics, such as collection of data from mobile devices and PCs/laptops
- possess a clear awareness of the ethical, legal and commercial responsibilities of a forensic science practitioner, and of the quality assurance and validation requirements relevant to professional competency.

5.5 In addition to the abilities above, a master's degree programme should be designed to enable students to develop:

- a deep experience of an appropriate range of the methods used in forensic science
- an open and innovative attitude to the development of new and emerging procedures and techniques relevant to forensic science
- an awareness of the moral and ethical issues involved in the practice of forensic science.

Generic graduate skills

5.6 A bachelor's degree with honours should be designed to enable students to develop:

- problem-solving skills, including the ability to formulate problems clearly and to identify key issues, and be able to apply different approaches to work towards a solution
- investigative skills, including the ability to carry out an independent investigation using multiple information sources and applying critical judgement
- communication skills, including the ability to present complex concepts and information in a clear and concise manner, both orally and in writing, and the ability to interact and communicate effectively within a wide range of professional environments
- analytical skills, including the ability to pay attention to detail, to construct logical arguments based on incomplete data, and to use technical language correctly
- ICT skills, including the use of databases, software packages and modern communications methods
- personal skills, including the ability to work both independently and as part of a team, and the ability to plan, organise and perform work efficiently and conscientiously in a timely way, meeting deadlines where necessary
- personal development skills, including the ability to identify and reflect on where further training or skill acquisition is necessary for self-improvement.

5.7 In addition to the abilities above, a master's degree programme should be designed to enable students to develop:

- self-direction and originality in problem solving
- an effective self-critical attitude in planning, carrying out and reporting investigations
- competence in their ability to interpret complex technical information and to communicate it in a wide variety of professional situations
- the independent learning ability required for continuing professional development.

Ethical behaviour

5.8 Students should fully appreciate that to fabricate, falsify, misrepresent or wilfully misinterpret evidence, data or the results of experiments is unethical and unacceptable. They should also:

- appreciate the serious consequences of careless or substandard practices
- be objective, unbiased and truthful in all aspects of their work
- recognise and acknowledge the limits of their knowledge
- recognise that plagiarism constitutes unethical scientific behaviour
- be aware of equality and diversity legislation
- be aware of ethical issues in the conduct of research.

6 Teaching, learning and assessment

6.1 The programme of teaching and learning should be designed to enable students to demonstrate the attainment of the stated learning outcomes of the course, and assessment strategies should be matched to these outcomes. The student should be supported in a progressive acquisition of subject knowledge and skills, gradually advancing towards more independent learning. The teaching and learning strategies should be reviewed and updated with advances in pedagogy, and in educational and professional information technology, although the balance between different methods may vary between institutions and programmes. Overarching considerations will be the demonstrable acquisition by the student of a clear appreciation of the scientific approach, and of the knowledge and skills needed for the practice of forensic science.

6.2 Teaching methods may include:

- lectures
- laboratory classes
- tutorials
- simulated crime scene experience
- case studies
- seminars and workshops, including courtroom simulations and oral presentations
- directed and independent study involving textbooks, electronic resources and other self-study materials
- problem-based learning
- interactive computer-based learning
- training and practice in the use of IT, such as databases and software control of experiments
- project work, both individual and in teams
- work-based learning
- reading and interpreting research publications.

6.3 Laboratory classes should support the taught curriculum, and in particular allow the student to acquire transferable technical and practical skills. This will include familiarity with a variety of forensic experimental methods and their scientific basis, and with methods to deal with uncertainties in their outcomes, such as data handling and statistics. The contemporaneous preparation of records and reports is likely to be emphasised.

6.4 At master's level, personal experience of research methods and of reading and interpreting research publications is expected, as is extended project work, including the preparation of a substantial original report.

6.5 A balanced scheme of assessment will include some or all of the following elements:

- unseen examinations
- open-book examinations and other tests

- laboratory reports
- computer-based assessments
- essays
- problem solving
- reports on simulated crime scenes
- critical analysis of case studies
- oral, audio-visual and poster presentations
- project reports or dissertations
- viva voce examinations
- peer and self-assessment
- group work.

6.6 Assessment will test the successful achievement of subject knowledge, and the acquisition of generic and subject specific skills embedded in the learning outcomes for the programme. It is appropriate that some assessment elements will test a student's ability to organise and complete work, and to communicate effectively, under constraints of time and pressure. Elements of the assessment should also allow students the opportunity to demonstrate reflection, originality and integration of their knowledge into practice.

7 Benchmark standards

7.1 The benchmark standards have been divided into two groups. The first set identifies the transferable and core skills that would be expected of all honours degree graduates in forensic science. The second group of standards relates to each of the three major themes of forensic science - the relative emphasis placed on them will vary between different providers and degree programmes.

7.2 In each case, the standards are divided into 'threshold' and 'typical'. These standards are intended to reflect the performance of the individual student. The threshold level is the core of the benchmark statement and is achieved by anyone obtaining an honours degree. Many students will perform significantly better than the threshold standard, and it is expected that most should achieve the typical standard.

7.3 The benchmark standard for master's degrees is identified at the end.

Generic standards, not specific to any particular theme

Threshold standard

7.4 All students graduating with an honours degree in forensic science are expected to be able to demonstrate:

- a basic knowledge of the relevant sciences, including mathematics and statistics (including the Bayesian approach), involved in forensic investigation

- a basic knowledge of forensic techniques
- competence in basic laboratory skills and procedures
- an ability to select and carry out practical laboratory experiments in forensic investigations, including the use of relevant standard equipment
- an awareness of the general issues and techniques involved in crime scene investigation
- an ability to interpret laboratory and other investigations, with a satisfactory awareness of the limitations of the methods used
- an awareness of the various legal and law enforcement environments within which forensic science is practiced
- an ability to record accurately, organise data, make rational deductions and present the results of an investigation both in written and oral forms
- an awareness of how scientific and technical progress is made within the discipline
- an ability to develop appropriate strategies to enable continuing professional development
- an awareness of, and commitment to, the ethical and legal obligations of science and particularly forensic science
- an awareness of, and respect for, issues and practices involved with the handling, storage and investigation of human tissues, DNA and other trace evidential materials
- an ability to comply with safe working practices, both for self and others
- an awareness of quality assurance procedures within a forensic science context.

Typical standard

7.5 Students graduating with an honours degree in forensic science at a typical level of attainment are expected to be able to demonstrate:

- a good knowledge of those sciences, including mathematics and statistics (including the Bayesian approach), involved in forensic investigation
- a good knowledge of forensic techniques
- confidence in laboratory skills and procedures
- an ability to select, carry out and develop practical laboratory experiments in forensic investigations, including the use of relevant laboratory equipment
- a good knowledge of the general issues and techniques involved in crime scene investigations
- an ability to interpret the results of laboratory and other investigations, with a thorough appreciation of their limitations
- a good knowledge of the various legal and law enforcement environments within which forensic science is practiced

- an ability to record results accurately, organise data, make rational deductions and present clearly the results of investigations both in written and oral form, in a manner which can be readily assimilated within a legal, law enforcement or court environment
- a critical appreciation of how progress is made within the discipline
- an evidenced commitment to continuing professional development
- a knowledge of, and commitment to, the ethical and legal obligations of science and particularly forensic science
- a good knowledge of and respect for issues and practices involved with the handling, storage and investigation of human tissues, DNA and other trace evidential material
- competence in safe working practices, both for self and others
- a critical appreciation of quality assurance procedures within a forensic science context.

Area-specific standards

Crime scene investigation

Threshold standard

7.6 All students graduating with an honours degree in forensic science with a particular emphasis on crime scene investigation are expected to be able to demonstrate:

- a knowledge of the principal techniques and skills required for the recognition, processing, recording, preservation, recovery, scientific analysis and interpretation of evidence at and from a range of crime scenes
- familiarity with the responsibilities, roles and liabilities of those involved in a crime scene investigation, and an ability to work effectively within such a team
- the ability to construct and manage investigation strategies
- appropriate written and oral communication skills.

Typical standard

7.7 Students graduating with an honours degree in forensic science with a particular emphasis on crime scene investigation at a typical level of attainment are expected to be able to demonstrate:

- a wide knowledge of the techniques and skills required for the collection, processing, recording, preservation and interpretation of evidence at a crime scene
- a clear understanding of the responsibilities, roles and liabilities of those involved in a crime scene investigation, and an ability to work effectively and contribute positively within such a team
- the ability to construct and manage efficient investigation strategies
- good written and oral communication skills.

Laboratory analysis

Threshold standard

7.8 All students graduating with an honours degree in forensic science with a particular emphasis on laboratory analysis are expected to be able to demonstrate:

- a knowledge of the theory and application of the principal laboratory methods used routinely in forensic science
- an ability to select and use a range of methods used in the location, identification, recovery, extraction and scientific analysis of commonly encountered physical, chemical and biological materials and marks, including trace materials such as DNA
- an ability to adhere to contamination avoidance procedures
- satisfactory written and oral communication skills.

Typical standard

7.9 Students graduating with an honours degree in forensic science with a particular emphasis on laboratory analysis at a typical level of attainment are expected to be able to demonstrate:

- a wide knowledge of the theory and application of the laboratory methods used in forensic science
- competence in the selection, use and development of a range of methods used in the location, identification, recovery, extraction and scientific analysis of commonly encountered physical, chemical and biological materials and marks, including trace materials such as DNA
- an ability to adhere to and develop contamination avoidance procedures
- good written and oral communication skills.

Interpretation, evaluation and presentation of evidence

Threshold standard

7.10 All students graduating with an honours degree in forensic science with a particular emphasis on the interpretation, evaluation and presentation of evidence are expected to be able to demonstrate:

- the ability to manage, interpret and communicate forensic evidence and experimental results in the context of casework, including expert opinion
- the ability to recognise and communicate levels of uncertainty in evidence or experimental data
- the ability to prepare and deliver impartial and comprehensible oral and written reports in a variety of legal and law enforcement situations, including those involving the public
- a working knowledge of prevailing legal standards applicable to evidence, including digital data.

Typical standard

7.11 Students graduating with an honours degree in forensic science with a particular emphasis on the interpretation, evaluation and presentation of evidence at a typical level of attainment are expected to be able to demonstrate:

- the ability to effectively manage, critically interpret and clearly communicate forensic evidence and experimental results in the context of casework, including expert opinion
- the ability to quantify and clearly communicate levels of uncertainty in evidence or experimental data
- the ability to prepare and deliver impartial, comprehensible and comprehensive oral and written reports in a wide variety of legal and law enforcement situations, including those involving the public
- a good working knowledge of prevailing legal standards applicable to evidence, including digital data.

Master's degrees

7.12 Students graduating with a master's degree are expected to be able to demonstrate:

- either a deep specialist knowledge and experience of techniques within a particular area of forensic science, or a wide knowledge and critical awareness of the whole discipline
- engagement and familiarity with recent and current research methods, results and publications
- an effective self-critical attitude in planning, carrying out and reporting investigations
- the abilities and skills necessary to devise, plan, carry out and report an original investigation or research project
- a clear recognition of the constraints and opportunities of the environment in which professional forensic science is carried out
- self-direction and originality in applying and adapting problem-solving skills to unfamiliar, complex and open-ended situations
- an open and innovative attitude in the ability to plan and execute new experimental procedures
- a familiarity with the moral and ethical issues involved in the practice of forensic science
- confidence in their ability to interpret complex technical information and to communicate it in a wide variety of professional situations
- the independent learning ability required for continuing professional development.

8 Professional standards and programme accreditation

8.1 Programme accreditation is available through The Forensic Science Society, based around adherence to its Component Standards.[10]

8.2 The design of forensic science degree programmes must ensure that students become familiar with current professional working practices. National Occupational Standards are available as a point of reference that higher education providers may wish to consult.[11] Skills for Justice also runs an optional recognition scheme for degree programmes, referred to as Skillsmark.[12]

8.3 There are additional standards that forensic science practitioners are required to work to and which course providers may wish to be aware of. These include standards reflected within the codes of practice set by the Forensic Science Regulator[13] and International organization for Standardization (ISO) standards.

[10] www.forensic-science-society.org.uk/accreditation

[11] www.skillsforjustice-nosfinder.com/suites.php?suite_id=20

[12] www.skillsforjustice.com/skillsmark

[13] www.homeoffice.gov.uk/agencies-public-bodies/fsr/codes-practice

Appendix: Membership of the benchmarking group for forensic science

Dr Laura Bellingham	Quality Assurance Agency for Higher Education (QAA)
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Charles Welsh	Skills for Justice
Sam Frost	National Policing Improvement Agency (NPIA)
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