

# **ETHICS TRAINING IN UNIVERSITIES**

## **Report for the Science and Trust Expert Group**

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## **INTRODUCTION**

The role of the Science and Trust Expert Group, set up by the Department of Business, Innovation and Skills, is to develop an Action Plan, in discussion with Government and other stakeholders in response to the Science and Society consultation. The Action Plan will:

- develop new mechanisms to increase public trust in science and engineering
- review the impact of the existing ethical code of practice and whether it meets the needs of science and society
- improve partnership working, facilitating the movement of knowledge and people across the different sectors in order to maximise the benefits and impacts of science and society activities
- pursue a more coherent evaluation model of the impacts of science and society initiatives

In 2007 the Government's chief scientific advisor, Professor Sir David King, set out a universal code of ethics for scientists - Rigour, Respect and Responsibility – to foster ethical research across the world.<sup>1</sup> This seven-point code is intended as a public statement of the values and responsibilities of scientists.

As part of its brief the Science and Trust Expert Group is looking at what training scientists can expect to receive in ethics.

## **METHODOLOGY**

The aim of this piece of research is to explore what ethics training is given in universities to students and researchers. The time available for the research has been limited, and desk research has therefore consisted of gathering information by examining a sample of publicly accessible information -

- frameworks and codes of practice;
- Framework for Higher Education Qualifications
- QAA Subject Benchmarks
- University ethics policies
- University ethics committees
- Programmes of study
- Ethics training courses

In addition, the Research Council statements on ethics training have been examined, and a number of representative bodies have been consulted for their position on and attitude to ethics training.

## **GENERAL FRAMEWORKS AND CODES OF PRACTICE**

The QAA Framework for Higher Education Qualifications (FHEQ)<sup>2</sup> in England, Wales and Northern Ireland outlines the expected skills and qualities which students are expected to have developed at each of the five levels (certificate, intermediate, honours, masters and doctorate, levels 4-8 in the National Qualifications Framework<sup>3</sup>), but these do not make specific reference to understanding and application of ethics, instead covering more general qualities such as an ability to exercise sound

professional judgement and personal responsibility. Candidates for a doctorate are expected to have detailed understanding of applicable techniques for research and advanced academic enquiry.

However, the so-called Dublin Descriptors outlined in the Framework for Qualifications of the European Higher Education Area (FQ-EHEA) do include the expectation that students will have gained some understanding of ethical issues:

Bachelors awards: 'should have the ability to gather and interpret relevant data (usually within their field of study) to inform judgements that include reflection on relevant social, scientific or ethical issues;'

Masters awards: 'have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgements.

At doctoral level ethical judgements are not mentioned but perhaps this is implicit within the requirement to 'have demonstrated a systematic understanding of a field of study and mastery of the skills and methods of research associated with that field'.

The Framework for Qualifications of Higher Education Institutions in Scotland<sup>4</sup> follows the same descriptors as those for England, except for students achieving HNDs who are expected to 'able to work in support of current professional practice and deal with ethical and professional issues under guidance.'

An examination of the QAA subject benchmarks<sup>5</sup> for honours and masters degrees indicates what students can expect to receive in the way of ethics training. This is not set out for all subject areas at this level; for example Chemistry at honours level does not include an ethics expectation. Within Health Studies the benchmark merely states that the subject 'should be informed by other academic disciplines' which should include to a greater or lesser extent subjects such as, for example, social sciences, economics, ethics and law. (See Appendix 2).

RCUK's Research Careers and Diversity strategy<sup>6</sup> lays out three main aims, which include 'help universities to improve the quality of their research training'. Its Research and Development group has responsibility for giving a lead on strategies relating to research, training and development, including research ethics. In 2006 the Research Councils were consulted about how the proposed Universal Ethical Code for Scientists fitted with their policies and procedures already in place to promote these standards. All the research councils are signatory to the terms and conditions of Research Council grants<sup>7</sup>, which include guidance on research ethics –

'The Research Organisation (*in receipt of a grant*) is responsible for ensuring that ethical issues relating to the research project are identified and brought to the attention of the relevant approval or regulatory body. Approval to undertake the research must be granted before any work requiring approval begins. Ethical issues should be interpreted broadly and may encompass, among other things, relevant codes of practice, the involvement of human participants, tissue or data in research, the use of animals, research that may result in damage to the environment and the use of sensitive economic, social or personal data.'

In addition the Research Councils have ethical guidance statements; for example ESRC requires that the research it supports is<sup>8</sup>:

- designed and conducted in such a way that it meets certain ethical principles
- subject to proper professional and institutional oversight in terms of research governance.

The BBSRC has a number of statements on ethical issues, such as Ethics, Morality and Animal Biotechnology<sup>9</sup>.

This all leads to requirements of researchers and students in receipt of grants to abide by the ethical principles laid out. However, in 2002 ESRC commissioned a review of ethics and social science research. The findings included: 'In terms of training, the Review found that efforts in universities are focused more on students than staff, suggesting that staff are assumed to be already familiar with the subject. This Review suggests that there might be a need for greater coherence in ethics training provision, especially for staff.' Following this review a framework was drawn up - ESRC Developing a Framework for Social Science Research Ethics, 2004, and a Framework for Research Ethics, 2010.<sup>8</sup>

All HEIs have a research ethics committee, and some of these are faculty-based. These oversee that research carried out meets the ethical standards laid down. For example in the University of Bristol each faculty is required to have a properly constituted Committee for Ethics. These are charged with ensuring that 'staff and students in the faculty have appropriate training in the ethical conduct of research'.

## **TRAINING**

The Royal Academy of Engineering has developed an engineering ethics curriculum map as a guide for academics interested in teaching ethics to engineering students<sup>10</sup>. This has been prepared to help engineers in their professional lives to understand and consider ethical issues which may arise, and suggests ways in which ethical training can be incorporated into the curriculum. This research has not found a similar curriculum map in other disciplines. The Royal Academy of Engineers then carried out a survey of whether the learning outcomes identified in the curriculum map were already being delivered, with the result being that there was 'some delivery' by the majority of respondents.<sup>11</sup> This probably reflects a more general picture across the HE sector.

### **Undergraduate Courses**

It is not always possible to obtain the details of undergraduate programmes of study and many institutions do not give full programme specifications on their public websites. It is therefore difficult to see how the QAA benchmarking statements are implemented across the sector. Hence the samples below only serve as an illustration of how ethics training is included at undergraduate level and further work is needed to gain a fuller understanding of this.

Degrees such as medicine, dentistry and veterinary sciences have both an expectation in the QAA subject benchmarking statements and, since they lead to professional accreditation, a requirement from the professional bodies to include ethics training. Students graduating in medicine have to be

registered by the General Medical Council in order to practise, and requirements are laid down by the GMC in its 'Tomorrow's Doctors'<sup>12</sup> which include 'Know about and keep to the GMC's ethical guidance and standards including Good Medical Practice, the 'Duties of a doctor registered with the GMC' and supplementary ethical guidance which describes what is expected of all doctors registered with the GMC.' It appears that this is integrated into the curriculum, for example in University of Birmingham students in Years 1 and 2 of the MBChB programme are introduced to some of the key issues in biomedical ethics – eg genetic engineering. Similarly in the University of Leeds a personal and professional development programme runs through the first three years of the medical degree and includes ethics.

In dentistry, too, courses for dental students must have been approved by the General Dental Council and these are monitored annually.<sup>13</sup> This monitoring requires that institutions offering such courses show both how communication skills and ethics and professionalism are taught to students and also how they are assessed. At Queen Mary University of London, for instance, the BDS includes ethics and law relating to dental practice which is taught through case-orientated group discussions.

Veterinary science graduates are also required to meet the essential competences for registration which include: 'be aware of the ethical responsibilities of the veterinary surgeon in relation to individual patient care and client relations, and also more generally in the community in relation to their possible impact on the environment and society as a whole.'<sup>14</sup> The RCVS refers students to the QAA subject benchmarking statements to find out what is required in veterinary training. Training is therefore integrated into courses, as at the University of Edinburgh where veterinary students receive ethical training in Year 4. The award of a veterinary degree at the University of Cambridge qualifies graduates for membership of the Royal College of Veterinary Surgeons and so to practise, and therefore includes training in the competences required by that body.

For health sciences the QAA benchmarking statements suggest that ethics should be covered as a related subject rather than part of the course. The sample of courses examined did not illustrate how this suggestion is integrated into the programmes, but the University of Gloucestershire has a clear indication of how ethics is taught within its module on 'evidence-based practice' in the Community Health Studies honours top-up course.

In other undergraduate programmes ethics training is generally offered in the context of research projects and dissertations. At the University of Hertfordshire, Year 3 projects in biochemistry, bioscience and pharmaceutical science all include research methodology workshops on formulation, safety, ethics and implementation of research. Students in electrical and electronic engineering carrying out Year 2 mini projects are required to consider ethics and sustainability, and it is assumed that some instruction is given in this. In research skills modules biological sciences, ecology and genetics students at the University of Essex are taught to understand the health and safety and ethical issues related to scientific research, and undertake appropriate risk and ethical assessments of their project. At the University of Bath psychology students are expected to produce a research proposal and ethical statement for their third year project, having been given training in research methods during their second year.

Within other undergraduate courses there is a mixture of inclusion of ethics teaching and optional modules which cover the subject. The core modules in Biochemistry and Bioscience at the University of Hertfordshire, for instance, include instruction on aspects of human genetic screening, ethics and counselling, and for University of Essex students in genetics ethics relating to each of the module topics in Year 3 are covered. The final year of the BSc in electronic engineering at the University of Reading includes a module on social and ethical aspects of engineering. Students in biology at the University of York have the opportunity of taking an optional module in medical bioethics, while Keele University runs an elective ethics module for undergraduates in all disciplines.

The University of Edinburgh's School of Geosciences has a clearly laid out ethics policy<sup>15</sup>, and students' attention – whatever their level – is drawn to this. In Years 2 and 3 geography students have modules on research methods and are pointed towards the ethics policy.

Through the Interdisciplinary Ethics Applied (IDEA) Centre at the University of Leeds<sup>16</sup>, Ethics Theme Teams are working towards embedding ethics teaching into the curriculum across all disciplines, so that students can see the relevance of it in their discipline, and in their personal and professional lives.

Conversely, there is no mention of ethics in some of the programmes, for example astrophysics at the University of Hertfordshire, where this may or may not be included within different topics. In physical sciences at the University of Hull this is rarely specifically included, but students may encounter ethical issues as part of the discussion of other topics.

(The Institute of Physics has a web-based project called Physics Ethics & Education Project (PEEP)<sup>17</sup> which although aimed at school students and teachers contains information which could be of interest to undergraduates.)

Ethics training does not appear to be a universal element of all undergraduate science courses. Where the nature of the subject demands it, for example in medicine, or where there is a research project (for example in psychology) training is included. Other modules are designed to cover ethics relating to the subject, or may be offered as an option.

### **Postgraduate and researcher training**

The expectations for postgraduates are laid out in the QAA Code of Practice for the Assurance of Academic Quality and Standards in Higher Education<sup>18</sup> (see also Appendix 4) and include access to appropriate skills training. This includes an awareness of ethical issues arising from their research. Accordingly, postgraduates can expect to access a skills development programme suited to their needs. Alongside, and developed from this is the Concordat<sup>19</sup> to support the career development of researchers, a revised draft of which was published in 2007. This outlines the importance of the researcher's personal and career development and lifelong learning.

Postgraduate researcher training can be delivered in a variety of ways. Programmes may be laid on within the university, such as at King's College, London, where the graduate school runs a number of courses in research ethics. In 2008-2009 these were:

- Introduction to Research Ethics
- Governance issues for research with human participants

- Being an ethical researcher
- Keeping it Legal for Researchers

The University of York gives the opportunity for research students of 'Working with the head of the ethics committee, you will be introduced to the various ethical issues that face you as a research scientist, and you will discuss some actual case studies. You will be introduced to the people that can help if you find yourself in an ethical dilemma'.

The University of Birmingham uses WebCT to deliver two on-line modules for university researchers

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- Ethics 1: Good Research Practice
- Ethics 2: Working with Human Subjects

There are various training packages and schemes for postgraduates and researchers. Skills Forge<sup>20</sup>, based in the University of York and used by King's College London, London Metropolitan and Aberdeen Universities offers a web-based package of training for research students. Training can be tailored to individual needs but it is not clear whether there is specific training in research ethics.

Vitae<sup>21</sup>, a national organisation championing the personal, professional and career development of doctoral researchers and research staff in higher education institutions and research institutes, provides training workshops and courses in ethics for both doctoral researchers and their supervisors at different university venues. The organisation incorporates the GRADschool programme (a general training programme for postgraduate researchers). Vitae has also produced a researcher development framework, currently in the consultation stage, which outlines the expected outcomes from training, including understanding of ethics under 'professional conduct'.

Professional Ethics at Keele (PEAK)<sup>22</sup> is one of the largest and most successful providers of postgraduate ethics courses in Europe. This was developed from the teaching of medical ethics, and now includes both training for those with an interest in research ethics as well as taught degree programmes in ethics, and training for research ethics committees. PEAK has now run training courses for 40 universities across the UK.

The University of Leeds Interdisciplinary Ethics Applied (IDEA)<sup>16</sup> centre has also organised training and conferences on research ethics, as well as specialist training in tackling ethical issues which arise in the course of research. The centre has also produced a range of teaching materials and offers a searchable database of resources.

The research councils do not appear to offer specific training in ethics, although understanding of ethics is a requirement of their grants, apart from the Medical Research Council which has guidelines and offers some distance or face-to-face training aimed at practitioners.

### **ATTITUDES TOWARDS ETHICS**

There is a large body of stated frameworks, policies and codes of ethics for scientists which show the expectations both in terms of behaviour and training. These include the Universal Code of Ethics for Scientists, and statements by the research councils. The professional bodies such as the Institute of

Biology endorse the Universal Ethics code, and expect ethical awareness and understanding as a requirement of professional accreditation. HEFCE has no particular policy on ethics training, but funded the project carried out by the CIHE, the Institute of Business Ethics and Brunel University to draw up the 'how to' guide, 'Ethics Matters: Managing ethical issues in higher education'<sup>23</sup>. The guide stresses the importance of having coherent ethics policies across the university and staff training. Although not specifically covering student training, the guide notes that 'teaching ethics as part of the curriculum is extremely valuable.'

In its Code of Practice for Researchers, the UK Research Integrity Office<sup>24</sup> offers a useful checklist for researchers. It also states that: 'Organisations should provide training for researchers to enable them to carry out their duties and develop their knowledge and skills throughout their career. This should include training in the responsible design, conduct and dissemination of research. They should support researchers in identifying unmet needs for training and development.'

Generally research ethics is well covered within HEIs and institutions have a policy and guidance on this. For an example, see the University of Reading's Research and Enterprise Services guide for researchers on 'what I need to do'.<sup>25</sup> What is not easy to find from a survey of university websites is a statement on actual training in ethics.

The HEA subject groups were consulted as to their position on ethics training. The BioScience Subject Centre provides a series of resources on the theme of bioethics<sup>26</sup>, and has held a number of events on various aspects in bioethics. Its journal also has articles on the teaching of ethics in biosciences, and its website offers an ethics audit tool to help teachers in developing courses. The Physical Sciences Subject Centre on the other hand does not promote or support ethics training for its students and researchers specifically.

None of the university associations approached had a policy or view on ethics training.

## **CONCLUSION**

This brief survey illustrates that although universities have well developed research ethics policies and guidelines, and research is monitored by research ethics committees, training in ethics is less consistently in evidence. There are benchmarks and frameworks which outline what students and researchers can expect to receive, but it is difficult to triangulate these with the course outcomes and how these are implemented is not so clear. At undergraduate level, ethical training forms an important element in medicine and veterinary subjects, and in most institutions sampled it was clear where this took place in the curriculum. In other sciences there is evidence of ethics awareness-raising but not all programmes give enough detail for it to be clear where this is included. On the basis of the limited sample the evidence suggests that development of skills and understanding in respect of ethics is more explicit in professional subjects (eg medicine and veterinary sciences) than in theoretical sciences. At postgraduate level there is entitlement to programmes in skills and personal development, sometimes provided by the institution and sometimes externally, and there are other opportunities from organisations such as Vitae to receive training in ethics. As with undergraduate programmes assessment procedures for such postgraduate programmes are not given, and it is therefore difficult to know how the learning objectives are expressed or how learners

demonstrate achievement of them. For other researchers, there are opportunities within staff development programmes or through external training.

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## **APPENDIX 1**

### **Institutions sampled**

#### **Higher Education Institutions**

University of Bath  
University of Birmingham  
University of Bristol  
University of Cambridge  
University of Edinburgh  
University of Essex  
University of Gloucestershire  
University of Hertfordshire  
King's College London  
University of Leeds  
University of Liverpool  
University of Loughborough  
University of Manchester  
University of Newcastle  
University of Plymouth  
Queen Mary University of London  
University of Reading  
University of York

#### **Research Councils UK**

Arts and Humanities Research Council (AHRC)  
Biotechnology and Biological Sciences Research Council (BBSRC)  
Medical Research Council (MRC)  
Economic and Social Research Council (ESRC)  
Engineering and Physical Sciences Research Council (EPSRC)  
National Environment Research Council (NERC)  
Science and Technology Facilities Council (STFC)

#### **Professional Bodies**

Institute of Biomedical Sciences  
Health Professionals Council  
Institute of Biology  
General Dental Council  
General Medical Council  
General Optical Council  
British Psychological Society  
Royal College of Veterinary Surgeons  
Institute of Physics  
Institute of Chemical Engineers

**Organisations contacted**

Universities UK

HEFCE

Russell Group

Million Plus

Universities Alliance

Higher Education Academy

HEA Biosciences Subject Centre

HEA Engineering Subject Centre

HEA Physical Sciences Subject Centre

APPENDIX 2

QAA SUBJECT BENCHMARKS FOR HONOURS DEGREES –extracts relating to ethics

SUBJECT	ETHICS-RELATED BENCHMARKS
Agriculture, etc	<p>Subject awareness/understanding:</p> <ul style="list-style-type: none"> <li>• awareness of risks of exploitation and concern over sustainable solutions</li> <li>awareness of risks of exploitation and concern over sustainable solutions</li> </ul> <p>Abilities and Skills:</p> <ul style="list-style-type: none"> <li>• an understanding of issues of sustainability and environmental impact.</li> <li>• assess the ethical consequences of human activities to optimise community and environmental sustainability.</li> </ul> <p>Practical skills:</p> <ul style="list-style-type: none"> <li>• devising, planning and undertaking field, laboratory or other investigations in a responsible, sensitive and safe manner, paying due diligence to risk assessment;</li> <li>• ethical and data protection issues; rights of access; relevant health and safety regulations; legal requirements; and the impact of investigations on the environment</li> </ul> <p>Self management and PD skills:</p> <ul style="list-style-type: none"> <li>• recognising the moral, ethical and social issues related to the subject</li> </ul> <p>(Some requirement in benchmark levels to recognise ethical issues)</p>
Biomedical Science	<p>Subject specific skills: A biomedical science graduate will practice professionally and ethically and be aware of the need for compliance with health and safety policies, good laboratory practice, risk and control of substances hazardous to health assessments, the <i>Human Tissue Act</i> (2004), and the importance of quality control and quality assurance. Students who graduate from integrated programmes have the opportunity to demonstrate competence in these and other skills in a clinical laboratory environment.</p> <p>Skills to be acquired:</p> <ul style="list-style-type: none"> <li>• research skills, including ethics, governance, audit, experimental design, statistical analysis, literature searching, critical appraisal of literature and scientific communication</li> </ul> <p>Minimum benchmark levels include:</p> <ul style="list-style-type: none"> <li>• have some understanding of ethical issues and their impact on advances in biomedical science</li> </ul>
Biosciences	<p>Subject knowledge:</p> <ul style="list-style-type: none"> <li>• whatever the subject discipline, students should expect to be confronted by some of the scientific, moral and ethical questions raised by their study discipline, to consider viewpoints other than their own, and to engage in critical assessment and intellectual argument.</li> </ul>

	<p>Intellectual skills:</p> <ul style="list-style-type: none"> <li>recognise the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct.</li> </ul> <p>Practical skills:</p> <ul style="list-style-type: none"> <li>undertake field and/or laboratory investigations of living systems in a responsible, safe and ethical manner. For example, students must pay due attention to risk assessment, relevant health and safety regulations, issues relating to animal welfare and procedures for obtaining informed consent. In some biosciences, students will show that they respect the rights of access, for example, in field work or in order to map the genes of a community, family or group of plants or animals, including humans. They should show sensitivity to the impact of investigations on the environment, on the organisms or subjects under investigation, and on other stakeholders.</li> </ul> <p>Teaching, learning and assessment:</p> <ul style="list-style-type: none"> <li>(4.6) All honours degree students are expected to have some personal experience of the approach, practice and evaluation of scientific research (eg within a project or research-based assignment). This is likely to be in the students' final year and may draw on the experience gathered during the course as a whole. Such work is likely to include collection and analysis of information (eg from fieldwork, laboratory work, or questionnaires, as well as from the literature); interpretation of the information within the context of current knowledge; suggestions for further work; reference to safety and ethical considerations, where relevant; and a presentation or report on the findings. It may sometimes be appropriate for students to do this kind of work in areas not strictly related to research, for example, in education or in the public understanding of science. It is important that students undertaking a project that is not based in the laboratory or field have the opportunity elsewhere in the programme to acquire the practical skills detailed in paragraph 3.6. No matter how the research project is delivered, it is expected that it is a hypothesis-driven piece of work.</li> </ul> <p>General threshold level standard includes:</p> <ul style="list-style-type: none"> <li>have some understanding of ethical issues and the impact on society of advances in the biosciences</li> </ul>
Chemistry	<p><b>(Masters degrees) Professional studies</b></p> <ul style="list-style-type: none"> <li>Ethics and societal responsibilities.</li> <li>Environmental impact.</li> <li>Sustainability.</li> </ul>
Dentistry	<p>Nature of subject:</p> <p>It is essential that all dentists understand the need to act at all times reasonably, responsibly and within the public interest, putting the interests of their patients before those of themselves. Graduates from dental schools are required to demonstrate a thorough understanding of the importance of ethical practice and professionalism, high levels of ability in communication skills and competence in</p>

	<p>the clinical and technical aspects of dentistry.</p> <p>Subject knowledge and understanding:</p> <ul style="list-style-type: none"> <li>the medico-legal and ethical principles upon which the practice of dentistry is based, especially those relating to treatment of patients and involvement of patients in research;</li> </ul> <p>Transferable skills:</p> <ul style="list-style-type: none"> <li>make decisions based on sound ethical, moral and scientific principles;</li> </ul> <p>Professional behaviour and clinical governance:</p> <ul style="list-style-type: none"> <li>manage the ethical issues that may arise in dental practice;</li> <li>apply jurisprudence to the practice of dentistry;</li> <li>understand the implications of and obtain informed consent;</li> <li>understand the ethical and legal basis of confidentiality, including the need to maintain accurate and complete patient records in a confidential manner;</li> <li>provide empathetic care for all patients, including members of diverse and vulnerable populations, and respect the principle of patient autonomy;</li> <li>provide and receive constructive criticism;</li> <li>recognise and take appropriate action to help incompetent, impaired or unethical colleagues and their patients.</li> </ul> <p><b>Skills</b></p> <p>Graduating dentists will demonstrate:</p> <ul style="list-style-type: none"> <li>initiative and personal responsibility, making decisions based on sound ethical, moral and scientific principles, and applying an independent learning ability;</li> </ul>
Earth Sciences	<p>Intellectual skills:</p> <ul style="list-style-type: none"> <li>recognising the moral and ethical issues of investigations and appreciating the need for professional codes of conduct.</li> </ul> <p>Practical skills:</p> <ul style="list-style-type: none"> <li>undertaking field and laboratory investigations in a responsible and safe manner, paying due attention to risk assessment, rights of access, relevant health and safety regulations, and sensitivity to the impact of investigations on the environment and stakeholders Basic performance level for graduates to include:</li> <li>Ability to describe the moral and ethical dimensions of issues and investigations and the need for professional codes of conduct.</li> </ul>
Health Studies	No mention of ethics training, except in that the subject is informed by others including ethics.
Medicine	The medical course also seeks to impart appropriate professional and personal attitudes and behaviour, including critical evaluation, curiosity and lifelong learning skills as well as the ethical and legal framework of medical practice.

	<p>3 GMC goals in 'Tomorrow's Doctors' include: the student should acquire and demonstrate <b>attitudes</b> necessary for the achievement of high standards of medical practice, both in relation to the provision of care of individuals and populations and to his or her own personal development.</p> <p>Graduates should approach medical practice understanding and accepting their professional, ethical and legal responsibilities.</p> <p>Subject knowledge and understanding:</p> <ul style="list-style-type: none"> <li>• ethical and legal background of medical practice;</li> </ul> <p>General skills &amp; competencies:</p> <ul style="list-style-type: none"> <li>• In relation to all aspects of clinical practice, graduates will demonstrate appropriate professional behaviours, safeguarding confidentiality, understanding the need for informed consent, recognising their own limitations and being prepared to seek help from more experienced health care professionals when necessary.</li> </ul> <p>Professional attributes and competencies: Graduates need to apply ethical and legal knowledge to their practice, particularly in:</p> <ol style="list-style-type: none"> <li>a. applying the principles of confidentiality, consent, honesty and integrity;</li> <li>b. dealing effectively with complaints about either their own or colleagues' practice or behaviour;</li> <li>c. being aware and complying with legal and professional responsibilities, particularly with respect to death and dying; drug prescribing; mental health; physical and sexual abuse of children and adults; abortion; reporting unsatisfactory/inappropriate performance;</li> <li>d. considering the rights of patients;</li> <li>e. understanding and complying with requirements of clinical governance.</li> </ol>
Optometry	<p>Programmes should include –</p> <ul style="list-style-type: none"> <li>• an awareness of the legal, ethical and commercial restraints and constraints within which optometry operates</li> <li>• an understanding of legislation relating to the use and supply of ophthalmic drugs</li> </ul>
Osteopathy	<p>(these are areas of study which might be covered in Osteopathy degrees) Research studies include- research ethics</p> <p>Clinical and professional studies include - professional ethics</p> <p>Knowledge Skills and Understanding The nature of osteopathic undergraduate study is multidisciplinary. Degrees in osteopathy cover a broad curriculum including cognitive and conceptual learning, the acquisition of practical manual and palpatory skills, and generic skills such as effective communication (by written, electronic and oral means), team working, problem solving, the use of ICT, applying research and critical reasoning. The ethical and legal dimensions are combined with these so that the whole enables a comprehensive preparation of graduates for professional practice as osteopaths. Fundamental to the study of the discipline is the integration and</p>

	<p>application of knowledge and skills for safe and effective patient care, and the development of learner autonomy.</p> <p>In Knowledge and Understanding graduates will demonstrate –</p> <ul style="list-style-type: none"> <li>• the appropriate professional attitudes and behaviours consistent with being a healthcare practitioner</li> <li>• legislation and ethical principles relevant to the practice of osteopathy, and the consequent obligations on the practitioner</li> <li>• professional codes of conduct relevant to the practice of osteopathy</li> </ul> <p>Assessment - In achieving this, it is also important that empathy with and ethical behaviour towards patients, ethical conduct towards colleagues and others, and general behaviour consistent with that of an aspiring healthcare professional is demonstrated.</p>
<p>Physics, Astronomy and Astrophysics</p>	<p>(One new addition in the 2008 revised benchmark is section 4 on ethical behaviour)</p> <p>Subject based skills, generic skills and qualities:</p> <p><b>Ethical behaviour</b> Students should appreciate that to fabricate, falsify or misrepresent data or to commit plagiarism constitutes unethical scientific behaviour. They should be objective, unbiased and truthful in all aspects of their work and recognise the limits of their knowledge.</p>
<p>Psychology</p>	<p>Topic areas within psychology Ethical, theoretical and practical research issues arise in each of the knowledge areas within psychology:</p> <p>Subject specific skills include ability to –</p> <ul style="list-style-type: none"> <li>• employ evidence-based reasoning and examine practical, theoretical and ethical issues associated with the use of different methodologies, paradigms and methods of analysis in psychology</li> <li>• carry out an extensive piece of independent empirical research, including defining a research problem; formulating testable hypotheses/research questions; choosing appropriate methodologies; planning and carrying out a study efficiently; demonstrating awareness of ethical issues and current codes of ethics and conduct; obtaining the appropriate ethical approval for their research; demonstrating the ability to reason about the data and present the findings effectively; discussing findings in terms of previous research; evaluating methodologies and analyses employed and implications for ethics; and, where appropriate, collaborating effectively with colleagues, participants and outside agencies.</li> </ul> <p>Teaching, learning and assessment: Students should show familiarity with the ethical concerns within the discipline, especially in the conduct of empirical studies. This will include knowledge of the guidelines published by the British Psychological Society and the local institutional procedures for obtaining ethical approval.</p>

	<p>Threshold standard to include - be aware of ethical principles and approval procedures and demonstrate these in relation to personal study, particularly with regard to the research project. (Typical - be aware of ethical principles and approval procedures and demonstrate these in relation to personal study, particularly with regard to the research project, and be aware of the ethical context of psychology as a discipline.)</p>
<p>Veterinary Science</p>	<p>Students required to develop</p> <ul style="list-style-type: none"> <li>• a knowledge of the legal context of veterinary practice;</li> <li>• a sense of care and responsibility to patients and their owners and a welfare ethic for animals in general;</li> </ul> <p><b>Subject knowledge and understanding:</b> Principles of pharmacology and toxicology - ethical, environmental and human health implications of veterinary drug usage.</p> <p>Legal, environmental and ethical considerations:</p> <ul style="list-style-type: none"> <li>• the economic, environmental and public health consequences (beneficial and otherwise) of keeping animals;</li> <li>• medicine legislation and the guidelines on the responsible use of medicines;</li> <li>• the law and ethical codes relating to animals and to food hygiene;</li> <li>• statutory requirements for animal transport, slaughter houses, cutting plants and the storage of meat products;</li> <li>• the importance of research for the extension of the knowledge base in veterinary science;</li> <li>• the relationship between veterinary science, medical science and other biosciences;</li> <li>• sourcing and synthesis of information; the principles of biological statistics and their correct application.</li> </ul> <p><b>Application of subject knowledge and understanding:</b></p> <ul style="list-style-type: none"> <li>• demonstrate an understanding of veterinary public health issues and the procedures to follow with notifiable and zoonotic diseases;</li> </ul> <p><b>Professional and Personal skills:</b> The new veterinary graduate must, therefore, be able to:</p> <ul style="list-style-type: none"> <li>• conduct themselves in a professional manner with regard to the veterinarian's professional and legal responsibilities and understand and apply the ethical codes as set out in the <i>Guide to Professional Conduct</i> produced by the RCVS;</li> <li>• ☐ demonstrate an awareness of the role of veterinarians in the community, particularly in relation to ethical principles; ☐ demonstrate an awareness of the role of veterinarians in the community, particularly in relation to ethical principles;</li> </ul> <p>Standards: Graduates must be able to construct reasoned arguments to support their actions and positions on the ethical and social impact of veterinary science and the allied biosciences.</p>

## APPENDIX 3 – Example of mapping from Benchmark Statement to HEI module descriptor

### QAA SUBJECT BENCHMARK FOR PSYCHOLOGY (2007)

#### Topic areas within psychology

Ethical, theoretical and practical research issues arise in each of the knowledge areas within psychology:

Subject specific skills include ability to –

- employ evidence-based reasoning and examine practical, theoretical and ethical issues associated with the use of different methodologies, paradigms and methods of analysis in psychology
- carry out an extensive piece of independent empirical research, including defining a research problem; formulating testable hypotheses/research questions; choosing appropriate methodologies; planning and carrying out a study efficiently; demonstrating awareness of ethical issues and current codes of ethics and conduct; obtaining the appropriate ethical approval for their research; demonstrating the ability to reason about the data and present the findings effectively; discussing findings in terms of previous research; evaluating methodologies and analyses employed and implications for ethics; and, where appropriate, collaborating effectively with colleagues, participants and outside agencies.

#### Teaching, learning and assessment:

**Students should show familiarity with the ethical concerns within the discipline, especially in the conduct of empirical studies.** This will include knowledge of the guidelines published by the British Psychological Society and the local institutional procedures for obtaining ethical approval.

Degrees: Threshold standard to include - be aware of ethical principles and approval procedures and demonstrate these in relation to personal study, particularly with regard to the research project. (Typical standard - be aware of ethical principles and approval procedures and demonstrate these in relation to personal study, particularly with regard to the research project, and be aware of the ethical context of psychology as a discipline.)

### UNIVERSITY OF GLOUCESTERSHIRE, YEAR 1 PSYCHOLOGY MODULE - Y111: Introduction To Investigative Methods (from Curriculum Map)

Module Tutor	Tim Jones
Department	Department Of Natural And Social Sciences
CAT Points	30
Level of Study	I
Pre-requisites	N/A
Co-requisites	N/A
Brief Description	This module describes the principles of scientific research in psychology, and introduces a range of psychological research methods. In addition, the

	<p>module introduces statistical techniques used to analyse the results of psychological research. It is foundational for PY208 and PY306.</p>
Restrictions	<p>Cannot be counted with PY109/PY110</p>
Content Summary	<p>Introduction to scientific enquiry <b>Ethics in empirical research</b>          Understanding psychological literature as a source of research ideas Non-experimental quantitative approaches Qualitative research methods          Anatomy of experimental psychology The nature of variables Control of extraneous variables Operationism and the principles of psychological measurement Techniques for data collection Graphical displays of data          Using SPSS for statistical analysis Measures of central tendency and variance The normal distribution Probability, sampling distributions and hypothesis testing Reliability and validity Parametric vs. non-parametric statistics Tests of difference and tests of association Selecting statistical tests Writing reports of psychological research</p>
Learning Outcomes	<p><b>i. Knowledge and understanding</b>          Successful students will be able to demonstrate:1. An understanding of the nature of scientific enquiry.2. An understanding of applying some of these principles to both experimental and non-experimental research design.3. An understanding of the structure and details necessary to write a clear and understandable report of a psychological investigation, adhering to established norms.4. An understanding of the range of methods and techniques of investigative design employed in psychological research.5. Knowledge of a range of procedures of data analysis.6. Knowledge of the appropriate methods of reporting a variety of data.</p> <p><b>ii. Skills</b>          Successful students will be able to:1. Formulate testable hypotheses based on the psychological literature.<b>2. Design appropriate psychological investigations for a given research question, with due regard for ethical considerations.</b>3. Describe and present descriptive data for various categories of data.4. Select and conduct appropriate statistical tests.5. Reflect on the conduct of psychological investigations.6. Report on the results of psychological research in the appropriate format.</p>
Delivery	<p>Staff/student contact: 30% (lectures, seminars, laboratory work)          Student directed learning: 70%</p>
Assessment (For further details see the Module Guide)	<p>001: 20% Coursework: Standard: 1200 words or equivalent          002: 40% Coursework: Report: 2000 words or equivalent          003: 40% Examination: Digital: 1.50 hours          004: 20% Coursework: Standard: 1200 words or equivalent          005: 40% Coursework: Report: 2000 words or equivalent          006: 40% Examination: Digital: 1.50 hours</p>
Indicative	<p>The <a href="#">Learning Centre Catalogue</a> contains full details of the current reading</p>

Resources

list for this module. Further details may also be found in the Module Guide.

## **APPENDIX 4**

### **Appendix 3 (from QAA Code of Practice for the assurance of academic quality and standards in higher education, postgraduate research programmes, 2004)**

#### **Skills training requirements for research students: joint statement by the research councils/AHRB**

##### **Introduction**

The research councils and the Arts and Humanities Research Board (AHRB) play an important role in setting standards and identifying best practice in research training. This document sets out a joint statement of the skills that doctoral research students funded by the research councils/AHRB would be expected to develop during their research training.

These skills may be present on commencement, explicitly taught, or developed during the course of the research. It is expected that different mechanisms will be used to support learning as appropriate, including self-direction, supervisor support and mentoring, departmental support, workshops, conferences, elective training courses, formally assessed courses and informal opportunities.

The research councils and the AHRB would also want to re-emphasise their belief that training in research skills and techniques is the key element in the development of a research student, and that PhD students are expected to make a substantial, original contribution to knowledge in their area, normally leading to published work. The development of wider employment-related skills should not detract from that core objective.

The purpose of this statement is to give a common view of the skills and experience of a typical research student, thereby providing universities with a clear and consistent message aimed at helping them to ensure that all research training is of the highest standard, across all disciplines. It is not the intention of this document to provide assessment criteria for research training.

It is expected that each council/board will have additional requirements specific to their field of interest and will continue to have their own measures for the evaluation of research training within institutions.

##### **(A) Research skills and techniques - to be able to demonstrate:**

1. The ability to recognise and validate problems and to formulate and test hypotheses.
2. Original, independent and critical thinking, and the ability to develop theoretical concepts.

3. A knowledge of recent advances within one's field and in related areas.
4. An understanding of relevant research methodologies and techniques and their appropriate application within one's research field.
5. The ability to analyse critically and evaluate one's findings and those of others.
6. An ability to summarise, document, report and reflect on progress.

**(B) Research environment - to be able to:**

1. Show a broad understanding of the context, at the national and international level, in which research takes place.
2. Demonstrate awareness of issues relating to the rights of other researchers, of research subjects, and of others who may be affected by the research, eg confidentiality, ethical issues, attribution, copyright, malpractice, ownership of data and the requirements of the Data Protection Act.
3. Demonstrate appreciation of standards of good research practice in their institution and/or discipline.
4. Understand relevant health and safety issues and demonstrate responsible working practices.
5. Understand the processes for funding and evaluation of research.
6. Justify the principles and experimental techniques used in one's own research.
7. Understand the process of academic or commercial exploitation of research results.

**(C) Research management - to be able to:**

1. Apply effective project management through the setting of research goals, intermediate milestones and prioritisation of activities.
2. Design and execute systems for the acquisition and collation of information through the effective use of appropriate resources and equipment.
3. Identify and access appropriate bibliographical resources, archives, and other sources of relevant information. Use information technology appropriately for database management, recording and resending information.

**(D) Personal effectiveness - to be able to:**

1. Demonstrate a willingness and ability to learn and acquire knowledge.
2. Be creative, innovative and original in one's approach to research.

3. Demonstrate flexibility and open-mindedness.
4. Demonstrate self-awareness and the ability to identify own training needs.
5. Demonstrate self-discipline, motivation, and thoroughness.
6. Recognise boundaries and draw upon/use sources of support as appropriate.
7. Show initiative, work independently and be self-reliant.

**(E) Communication skills - to be able to:**

1. Write clearly and in a style appropriate to purpose, eg progress reports, published documents, thesis.
2. Construct coherent arguments and articulate ideas clearly to a range of audiences, formally and informally through a variety of techniques.
3. Constructively defend research outcomes at seminars and viva examination.
4. Contribute to promoting the public understanding of one's research field.
5. Effectively support the learning of others when involved in teaching, mentoring or demonstrating activities.

**(F) Networking and teamworking - to be able to:**

1. Develop and maintain co-operative networks and working relationships with supervisors, colleagues and peers, within the institution and the wider research community.
2. Understand one's behaviours and impact on others when working in and contributing to the success of formal and informal teams.
3. Listen, give and receive feedback and respond perceptively to others.

**(G) Career management - to be able to:**

1. Appreciate the need for and show commitment to continued professional development.
2. Take ownership for and manage one's career progression, set realistic and achievable career goals, and identify and develop ways to improve employability.
3. Demonstrate an insight into the transferable nature of research skills to other work environments and the range of career opportunities within and outside academia.
4. Present one's skills, personal attributes and experiences through effective CVs, applications and interviews.