



QAA

Subject benchmark statement

**Agriculture, horticulture, forestry,
food and consumer sciences**

2009

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Contents

Preface	
Foreword	1
Introduction	3
Defining principles	4
Subject knowledge and understanding	7
Abilities and skills	8
Teaching, learning and assessment	11
Benchmark standards	12
Appendix A: Indicative programme titles	34
Appendix B: Membership of the review group for the subject benchmark statement for agriculture, horticulture, forestry, food and consumer sciences	37
Appendix C: Membership of the original benchmarking group for agriculture, horticulture, forestry, food and consumer sciences	38

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.

This subject benchmark statement, together with others published concurrently, refers to the **bachelor's degree with honours**.¹ In addition, some subject benchmark statements provide guidance on integrated master's awards.

Subject benchmark statements are used for a variety of purposes. Primarily, they are an important external source of reference for higher education institutions (HEIs) 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 a specification of a detailed curriculum in the subject.

Subject benchmark statements also provide support to HEIs 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. Their use in supporting programme design, delivery and review within HEIs is supportive of moves towards an emphasis on institutional responsibility for standards and quality.

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 this document and those produced by professional, statutory or regulatory bodies for individual disciplines will be a matter for individual HEIs to consider in detail.

This subject benchmark statement represents a revised version of the original published in 2002. The review process was overseen by the Quality Assurance Agency for Higher Education (QAA) as part of a periodic review of all subject benchmark statements published in this year. The review and subsequent revision of the subject benchmark statement was undertaken by a group of subject specialists drawn from, and acting on behalf of, the subject community. The revised subject benchmark statement went through a full consultation with the wider academic community and stakeholder groups.

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

¹ 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).

The Disability Equality Duty (DED) came into force on 4 December 2006 in England, Scotland and Wales. The DED requires public authorities, including HEIs, to act proactively on disability equality issues. The DED complements the individual rights focus of the Disability Discrimination Act and is aimed at improving public services and outcomes for disabled people as a whole. Responsibility for making sure that such duty is met lies with HEIs.

The Equality and Human Rights Commission has published guidance² to help HEIs to implement the DED and provides illustrative examples on how to take the DED forward. HEIs are encouraged to read this guidance when considering their approach to engaging with components of the Academic Infrastructure³, of which subject benchmark statements are a part.

Additional information that may assist HEIs when engaging with subject benchmark statements can be found in the *Code of Practice (revised) for providers of post-16 education and related services*,⁴ and also through the Equality Challenge Unit⁵ which is established to promote equality and diversity in higher education.

² Copies of the guidance *Further and higher education institutions and the Disability Equality Duty, Guidance for Principals, Vice-Chancellors, governing boards and senior managers working in further and higher education institutions in England, Scotland and Wales* may be obtained from www.dotheduty.org/sectoral-guidance.asp

³ An explanation of the Academic Infrastructure, and the roles of subject benchmark statements within it, is available at www.qaa.ac.uk/academicinfrastructure

⁴ Copies of the *Code of Practice (revised) for providers of post-16 education and related services*, published by the Disability Rights Commission, may be obtained from: www.equalityhumanrights.com/uploaded_files/code_of_practice__revised__for_providers_of_post-16_education_and_related_services__dda_.pdf83.137.212.42/...service_provider/education/...education/drc__post_16_code_of_practice.html

⁵ Equality Challenge Unit: www.ecu.ac.uk

Foreword

The subject benchmark statement for agriculture, horticulture, forestry, food and consumer sciences⁶ was first produced in 2002 by a committee made up of a representative group of subject specialists in response to an invitation from the Quality Assurance Agency for Higher Education (QAA). In 2008, in line with QAA's original commitment to oversee the review of existing subject benchmark statements every five years, a small committee was formed for the purposes of revising the existing subject benchmark statement.

The subject benchmark statement for agriculture, horticulture, forestry, food and consumer sciences continues to fulfil its original intention, which can be summarised as follows:

- to make explicit the nature and standards of awards that carry the subject in their titles
- to acknowledge the difference and diversity of programmes within agreed limits set by the subject community itself
- to provide scope for variety and flexibility in the design of programmes and encourage innovation within an agreed conceptual framework
- to explain the conceptual framework which gives the discipline its coherence and identity
- to set out the attributes and capabilities expected of graduates, in order to represent the general expectations of standards in awards
- to guide internal and external reviews of programmes within institutions.

The existing subject benchmark statement was therefore subject to only minor changes, largely to reflect developments in the subject.

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⁶ Originally published as Agriculture, forestry, agricultural sciences, food sciences and consumer sciences (2002)

1 Introduction

1.1 The purpose of this subject benchmark statement (statement) is to make explicit the nature and the standard of degree awards in the subject areas of the land-based industries and professions, related applied and social sciences, rural studies, and consumer sciences and studies. The statement will clarify the boundaries of each subject area and the specific threshold, typical and excellent standards for the award of an honours degree.

These subjects have been grouped on the basis that all are concerned with production of food and non-food products from land resources, consumer products and services, and ecosystem and other services. Although the focus changes, each subject encompasses various aspects of production chains involving animals, crops and retail of consumer goods and services. They all involve consumer interactions with producers, service providers and other stakeholders. Sustainable and secure production, consumption and development are important areas of study in these subjects as scarcity of resources impacts on a global scale, highlighting the need to modify consumer attitudes and behaviour.

1.2 The review group endorses the view that statements do not constitute definitive regulatory criteria for individual programmes or awards. They provide valid frames of reference within which an honours degree in a discipline should be offered. They need to be used with particular care in interdisciplinary or multidisciplinary contexts, where simple or general application may be inappropriate.

1.3 This benchmark statement will assist:

- higher education institutions (HEIs) to design and validate programmes of study
- external examiners and academic reviewers to compare and verify standards
- professional bodies (if and where appropriate) to review processes and content for the purpose of accreditation
- students and employers to obtain information on the purpose and content of degree courses.

1.4 The programmes covered in this statement are not taught at all HEIs. Often the subjects are taught as a 'cluster'. Individual HEIs may focus on, and have national and international recognition for, specialising in teaching and research in these subject areas as well as constituent and cognate disciplines.

1.5 In 'mapping the territory', the original benchmarking group aimed to identify the typical substantive core of the main programme areas. Programmes in these subjects provide academically rigorous study of material of relevance which will be applicable in the world of work and to society. Many programmes of study provide a period of work placement. A common feature of the programmes covered in this statement is that they are applied academic subjects, often involving study across more than one discipline, and often integrating aspects of chemical, physical, biological, economic and social sciences. The diversity of programmes and the extent of interdisciplinary work allow students entering higher education to choose a course with an emphasis suited to their needs and aspirations. They develop the student's ability to understand, use and contribute to the further development of the subject. Many courses are concerned with aspects of human use of the biosphere and with people in their role as managers and/or consumers of goods or services.

The degree programmes covered by this benchmark statement can be described under the following indicative headings:

Programmes broadly concerned with land-based industries

Agriculture and horticulture are the science, occupations, businesses and industries involved with the generation of food and other products through the management and manipulation of the terrestrial biosphere. Other programmes may be broadly concerned with the husbandry, welfare and management requirements of companion animals and animals kept for their athletic abilities or the recreational and sporting interests of their owners. The subjects apply fundamental physical, biological, economic and sociological principles to sustainable production in the countryside and consider the social and environmental impacts of such management systems.

Programmes broadly concerned with applied sciences

Agricultural sciences are the fundamental sciences of plants, animals, fungi, microorganisms, soils and global processes, which underpin human utilisation of the biosphere, including the production or management of animals and plants for food and other products, the husbandry and management of companion animals, and the sustainable management of productive resources for economic or social value.

Food science and technology is the understanding and application of a range of sciences to satisfy the needs of society for sustainable food security, quality and safety.

Programmes broadly concerned with rural studies/sciences

Rural studies address the application of fundamental biological, economic and sociological principles to the sustainable management of the countryside in the interests of society as a whole.

Forestry is the application of physical, biological, economic and sociological principles to the sustainable management of trees, woodlands and forests for the benefit of society.

Programmes broadly concerned with consumer sciences/studies

Consumer sciences/studies are defined as interdisciplinary subjects which seek to understand the relationships between the consumer and the economic, legal, social, technical, ethical and environmental forces which influence the development, provision and consumption of goods and services.

2 Defining principles

2.1 The subject group for this statement is large and diverse. Rather than attempt to ensure that all possible aspects are covered, all interests represented and all nuances of the subjects detailed, the benchmark statement seeks to provide a practical guide to the essential features of the range of degree programmes. All the degree programmes are application-orientated, broadly-based and require some study across a spectrum of disciplines from physics and chemistry through biology to the social sciences, policy, economics, management and consumer behaviour.

2.2 The study programmes covered by this statement will display distinctive features relating to the generation of 'products' (often originating from the terrestrial biosphere) and their subsequent processing, marketing and consumption. Studies of production processes, transformation processes, business environments, consumer behaviour and social values will be apparent. The initial resources may be biological, environmental or social and be capable of being assigned an economic value. A product chain may be apparent, set in a business and economic framework for producers and consumers. The 'products' have to be safe for consumers, and so policy, legal, ethical, and health and safety issues will be apparent. Environmental impacts and sustainability will also feature.

2.3 Degree programmes covered by this statement are interdisciplinary, drawing on diverse disciplines but each with a clear and integrated set of learning outcomes. The programmes will include many elements that are subject-specific. Other elements relate to the context of the degree programme and will give a broad appreciation of the relevant underpinning in physical, chemical, biological or nutritional principles, economic and business analysis, human behaviour, social and environmental context, and the linkages between these. Programmes will often examine processes and their management, and have a clear focus of utility and application.

2.4 There is a measure of institutional diversity in the provision of programmes which will reflect the individual institutional strengths and programme aims in relation to specific sectors of the graduate labour market. Graduates typically gain employment in a wide range of industries and organisations. Some HEIs recognise this with a range of award titles. Others offer diversity through option choice and specialisation opportunities within programmes of study that may include work-based placements. Programme definition is a dynamic process and new configurations of component subjects will emerge in response to developments in these subjects, changes in the needs and aspirations of society, and in response to opportunities in the graduate labour market.

2.5 Although individual degree programmes differ in their focus, broad indicative definitions of the various degree programme groups and of the capabilities of graduates are given below.

Programmes broadly concerned with land-based industries

2.6 Degree programmes in **agriculture** are designed to develop the knowledge and skills required by those who may go on to manage agricultural enterprises, agri-food businesses, and those who are involved in closely related official or commercial research and advisory work. Graduates with agricultural degrees will have a thorough understanding of crop and animal production methods and of the underpinning scientific, economic and business principles. In particular they will be able to identify technological and economic problems encountered in current production systems; evaluate new techniques and, where appropriate, apply them to commercial practice; know how to organise and manage a business; identify and evaluate public concerns over food production practices and evaluate the wider consequences of agricultural activities.

2.7 Degree programmes in **horticulture** are designed to develop the knowledge and skills required by those who may go on to manage horticultural enterprises and related businesses and those who are involved in closely related official or commercial research and advisory work. Graduates with horticulture degrees will have a thorough understanding of plant manipulation and production methods and of the underpinning

scientific, economic and business principles. In particular, they will be able to identify technological and economic problems encountered in current production systems; evaluate new techniques and, where appropriate, apply them to commercial practice; appreciate the social, rural and urban landscape values associated with horticulture; organise and manage a business; identify and evaluate public concerns over production practices; and evaluate the wider consequences of horticultural activities.

Programmes broadly concerned with applied sciences

2.8 Degree programmes in the **agricultural sciences** are concerned with the scientific basis of agriculture, horticulture and related applied sciences. They include all the sciences underpinning the sustainable production and use of animals, fungi, plants and their products, including food and non-food materials. Graduates of agricultural science programmes will have developed and integrated their knowledge and skills across areas of applied biology, physics and chemistry appropriate to the programme. The degree programmes will develop students' appreciation of, and ability to apply, detailed scientific knowledge and understanding in key sub-disciplines appropriate to the programme. These sub-disciplines are likely to include soil science; animal and plant nutrition and husbandry; product quality; the biochemistry and physiology of animals and plants; genetics (including genetic engineering); endocrinology; reproductive and developmental biology; and weed, pest and disease control and animal welfare; together with aspects of management, economics, environmental interactions, sustainability and bioethics.

2.9 Degree programmes in **food science and technology** are designed to develop the knowledge and skills required by those who are involved in food supply, manufacture and sale, and associated regulatory and advisory work. Graduates with degrees in food science and technology will have an understanding of the characteristics and composition of major food materials; the microbiology, nutritional quality, chemistry, physical properties and eating qualities of food; and the impact of food storage and processing. In particular, they will be able to identify and respond to technological and economic challenges encountered in food chains; evaluate developing technologies and, where appropriate, apply them to commercial practice; understand the appropriate legislation; identify and evaluate public concerns on food safety; evaluate the wider consequences of food chain activities; and minimise any harmful effects on the environment and on people.

Programmes broadly concerned with rural studies/sciences

2.10 Degree programmes in **rural studies** are designed to develop the knowledge and skills of those who are involved in a range of activities in the countryside. Some degree programmes may have a primary concern with the economic structure of the agricultural, horticultural or forestry industries and their associated and ancillary enterprises. Others may address the physical, social and cultural aspects of the rural environment, while some may have a focus on the complex ecology of both managed and unmanaged landscapes. The degree programmes are multidisciplinary frameworks within which there are discrete specialisms. Graduates in rural studies will take an integrated and holistic approach within an analytical and evaluative framework. They will view the countryside as a complex environmental and cultural resource of great national and global value. Graduates will be able to address the issues of sustainability and the

conflict between commercial production and the competing demands of society in a physically and culturally diverse landscape.

2.11 Degree programmes in **forestry** are designed to develop the knowledge and skills of those who go on to work in the forestry profession. Graduates will have a thorough understanding of the physical, biological, economic and sociological principles and processes that underpin forestry. They will be able to apply such principles and processes to the sustainable management of trees, woodland and forests for multiple goods and ecosystem services (for example, carbon accumulation; conservation; landscape; production of wood and non-wood forest products; protection of soil and water resources; and recreation). They will understand the social and environmental contexts in which forestry is practised and the consequences of forestry for society and the environment.

Programmes broadly concerned with consumer sciences/studies

2.12 Programmes in **consumer sciences/studies** have a focus on the consumption of goods and services and on the behaviour of people as consumers. With the increasing importance of sustainable consumption and development, there is an interest in how consumer choices are made and can be modified. This includes critical analysis of the social, economic, legal, technological, ethical and environmental contexts within which consumer choices are made. There is also concern with the development, production and provision of goods and services in terms of quality, acceptability, value, safety and accessibility for consumers. All consumer sciences/studies programmes have strong vocational elements; many offer work-based learning or placements and some have projects designed to meet the needs of external organisations. The programmes are set in appropriate theoretical frameworks with an emphasis on equipping students with the knowledge and skills required to make informed decisions. A graduate in consumer sciences/studies will understand the social and psychological contexts of consumer behaviour. Graduates will understand the economic, legal, scientific and technological principles underlying the production of, and access to, goods and services. They will be able to select and apply concepts, theories and methods drawn from constituent disciplines to the analysis of consumer issues and other factors affecting consumer choice.

3 Subject knowledge and understanding

3.1 Given the diversity of award titles (see Appendix A, page 34) and differences in emphasis among individual programmes of study, it is not sensible to list all the disciplines which might contribute to specific degree programmes. Thus, it is not possible to specify a precise core subject knowledge which will be common to all the subjects considered by the review group. Nevertheless, courses in these subject areas will share common features of structure, approach and pedagogic philosophy.

3.2 This section describes the general characteristics of the programmes under consideration, with the aim of facilitating and encouraging a diversity of provision across higher education. Each HEI will be able to map its own provision within this general framework.

3.3 For individual degree programmes, the content will depend on whether the objective is to produce a graduate who is a 'general practitioner' or a 'subject specialist', that is, a graduate who is skilled in a broad or a narrow range of disciplines. The balance between breadth and depth of a graduate's knowledge will thus be similarly variable.

Nevertheless, graduates will possess an appreciation of the interacting nature of a range of elements growing out of a more specialist understanding of some of them. Typically, students will develop an ability to synthesise concepts and ideas across disciplines and to take a holistic view appropriate to their particular subject.

3.4 Despite the diversity, the subject areas being considered share a number of important features:

- the relevance and application of the subject
- the development of integrated, multidisciplinary and interdisciplinary approaches
- integration of theory, experiment, investigation and fieldwork, and the development of principles into practice
- quantitative and qualitative approaches to information
- awareness of risks of exploitation and concern over sustainable solutions
- consideration of continuing change and development of the subject.

3.5 Each degree programme will address:

- the underlying principles of the subject
- its relevant defining concepts, theories and methods
- the current knowledge and development of the subject
- identification of current gaps in knowledge or understanding and current issues of wider concern to society and the world
- the global, regional and local contexts of the topic
- the location of resources, and the management, exploitation and pattern of utilisation of resources within socio-economic, policy and legal frameworks
- subject-specific and key skills, problem-solving and a professional approach to study and lifelong learning
- an understanding of issues of sustainability and environmental impact.

4 Abilities and skills

4.1 Honours graduates of programmes covered by this benchmark statement should be able to:

- demonstrate familiarity with a wide range of subject-specific facts and principles in combination with an awareness of the current limits of theory and applied knowledge
- understand the provisional nature of information and allow for competing and alternative explanations within their subject
- exhibit ownership of the defining elements of the discipline as a result of in-depth study or research
- tackle problems by collecting, analysing and evaluating appropriate qualitative and quantitative information, and using it creatively and imaginatively to solve problems, introduce and develop innovations, and make decisions
- plan and execute research or development work, evaluate the outcomes and draw valid conclusions

- display skills in evaluating and interpreting, in a balanced manner, new information provided by others from a range of fields of study
- display the transferable skills and ability to acquire new competencies required for career progression
- assess the ethical consequences of human activities to optimise community and environmental sustainability.

4.2 The abilities and skills that should be developed during the course of degree programmes covered by this benchmark statement are subdivided into:

- intellectual skills
- practical skills
- numeracy skills
- communication skills
- information and communication technology (ICT) skills
- interpersonal/teamwork skills
- self-management and professional development skills.

4.3 These skills will normally be developed in a subject-specific context, but have wider applications for continuing personal development and in the world of work. The subject skills will encompass technical knowledge and abilities specific and appropriate to the focus of the degree programme. In addition, each individual programme will develop a capacity for holistic and lateral thinking and an appreciation of both inductive and deductive reasoning.

4.4 **Intellectual skills**

- recognising and using appropriate theories, concepts and principles from a range of disciplines
- collecting and integrating several lines of evidence to develop balanced arguments
- designing an experiment, investigation, survey or other means to test a hypothesis or proposition
- critically analysing information, synthesising and summarising the outcomes
- applying knowledge and understanding to address multidisciplinary problems
- creativity and innovation
- demonstrating awareness of the provisional nature of the facts and principles associated with a field of study
- decision making in complex and unpredictable contexts.

4.5 **Practical skills**

- planning, conducting and reporting on investigations, including the use of secondary data
- collecting and recording diverse types of information generated by a wide range of methodologies and summarising it using appropriate qualitative and/or quantitative techniques

- devising, planning and undertaking field, laboratory or other investigations in a responsible, sensitive and safe manner, paying due diligence to risk assessment; ethical and data protection issues; rights of access; relevant health and safety regulations; legal requirements; and the impact of investigations on the environment
- appreciating and analysing financial and other management information and using it in decision-making.

4.6 Numeracy skills

- appreciating issues of sample selection, accuracy, precision and uncertainty during collection, recording and analysis of data in the field, laboratory or collated from secondary sources
- appreciating the difficulties of having incomplete information on which to base decisions
- understanding the nature of risk
- preparing, processing, interpreting and presenting data, using appropriate qualitative and quantitative techniques and packages
- solving numerical problems using computer-based and other techniques.

4.7 Communication skills

- receiving, evaluating and responding to a variety of information sources (that is, electronic, textual, numerical, verbal, graphical)
- communicating accurately, clearly, concisely, confidently and appropriately to a variety of audiences in written, verbal and graphical forms
- contributing constructively to group discussions
- considering, appreciating and evaluating the views of others.

4.8 ICT skills

- using the internet critically as a means of communication and a source of information
- demonstrating competence in the use of computer-based information handling and data processing tools
- using computer software to communicate information to a range of audiences effectively.

4.9 Interpersonal and teamwork skills

- organising teamwork and participating effectively in a team
- setting realistic targets
- identifying individual and collective goals and responsibilities
- planning, allocating and evaluating the work of self, individuals and teams
- performing in a manner appropriate to allocated roles and responsibilities
- recognising and respecting the views and opinions of other team members
- having positive intent
- reflecting on and evaluating own performance as an individual or as a team member.

4.10 Self-management and professional development skills

- appreciating the need for professional codes of conduct where applicable
- recognising the moral, ethical and social issues related to the subject
- assuming responsibility for one's actions
- identifying and working towards targets for personal, academic and career development
- developing an adaptable and flexible approach to study and work
- developing the skills necessary for self-managed and lifelong learning (that is, working independently, time-management and organisation skills)
- demonstrating the competence, behaviour and attitude required in a professional working life, including initiative, leadership and team skills.

5 Teaching, learning and assessment

5.1 The ultimate goal of student learning will be the considered application of knowledge and skills together with an appreciation of the integrative nature of the subject areas in an appropriate context.

5.2 As students progress through a degree programme there will be increasing reliance on student-centred modes of learning, which will foster the development of a professional approach to lifelong learning.

5.3 Graduates in these subjects have wide employment prospects and need to be adaptable as well as having subject-specific knowledge and abilities and transferable skills. There will be many different formats for teaching and learning in order to develop these attributes. All programmes will incorporate a research project or other self-motivated individual study leading to a thesis, dissertation or report. Programmes will also contain most (but not necessarily all) of:

- lectures
- tutorials and seminars
- student-led seminars
- specialist external lectures
- practical classes in and outside the laboratory (defined broadly and including the computing laboratory and other specialist facilities)
- literature-based research
- database, web-based and other e-learning technologies
- case studies
- problem solving
- problem-based learning
- working in groups on realistic/live projects with external organisations
- other exercises which require students to integrate information and techniques
- visits to commercial and industrial businesses, consumer organisations, public services, policy-making bodies and research or monitoring HEIs
- opportunities for work experience, for example a managed placement or work-based learning.

5.4 Assessment will be formative as well as summative and is likely to take a number of forms, including examinations (written, oral or practical; closed or open book), and to incorporate continuous assessment. The style of assessment will vary between disciplines and HEIs, but will be linked to clearly defined goals and anticipated learning outcomes. It will be managed to promote deep rather than surface learning. Assessments based on real-life problems, with employer involvement and with effective feedback, are valuable and will be included, provided they are compatible with the assurance of academic standards.

6 Benchmark standards

6.1 In this section, standards of attainment are expressed as statements of learning outcomes. These describe what a student should be able to achieve on completion of an honours degree in the range of subjects covered by this subject benchmark statement. The outcomes will be demonstrable through appropriate assessment strategies. It is recognised, however, that not all learning outcomes can be objectively assessed. Preceding sections have emphasised the diversity of degree programmes covered by this statement. Many of the degree programmes involve study in more than one subject area and may cover a relatively broad or narrow range of topics. This needs to be considered when evaluating levels of student performance. It is important that standards of attainment reflect the shared values of the academic community as moderated internally and externally by academic quality procedures, including the external examiner system.

6.2 Table 1 (page 13) and table 2 (page 17) articulate standards at three levels: 'threshold', 'typical' and 'excellent'. These are defined as:

- **threshold standard:** the minimum required to gain an honours degree; students at this level will be able to demonstrate an acceptable level of ability and skills
- **typical standard:** the level of attainment expected of the majority of students; such students will demonstrate definite competence and skills
- **excellent standard:** students achieving this standard will have a range of competencies and skills at an enhanced level.

6.3 The benchmark standards are defined in table 1 for the seven main categories of abilities and skills outlined in section 4.2, and in table 2 for subject-specific skills. These categories do not constitute a checklist, nor does the list imply any particular weighting. Whereas the full range of abilities and skills should feature in undergraduate programmes, their point of introduction and the level of engagement will be decided by curriculum designers.

6.4 To reach a given standard at the point of completion of an honours degree in the subjects covered by this statement, students should demonstrate achievement across the main categories of abilities and skills in tables 1 and 2, interpreted for the particular degree programme. However, a lower performance in one category may be compensated by a higher performance in another.

6.5 The standards in the following tables should be read in conjunction with sections 4 and 5, and paragraphs 6.1 to 6.4.

On completion of an honours degree covered by this statement, a student should be able to:

Table 1: Benchmark standards - generic skills

	Threshold	Typical	Excellent
<p>Intellectual skill</p>	<ul style="list-style-type: none"> ● recall knowledge based on the directly taught programme ● demonstrate some understanding of subject-specific theories, paradigms, concepts and principles ● demonstrate ability to define and solve routine problems ● collate, summarise and analyse information ● integrate lines of evidence from a limited range of sources to support findings and hypotheses ● demonstrate some ability to consider issues from a range of multidisciplinary and interdisciplinary perspectives ● source academic literature and extract relevant points. 	<ul style="list-style-type: none"> ● recall knowledge based on the directly taught programme with some evidence of wider enquiry ● demonstrate understanding of subject-specific theories, paradigms, concepts and principles, as well as some understanding of more specialised areas ● demonstrate ability to define problems, and devise and evaluate solutions to both routine and unfamiliar problems ● analyse, synthesise, summarise and evaluate information ● integrate lines of evidence from a range of sources to formulate and test hypotheses ● demonstrate the ability to consider issues from a range of multidisciplinary and interdisciplinary perspectives and to draw on appropriate concepts and values in arriving at a critical assessment ● critically appraise academic literature and other sources of information. 	<ul style="list-style-type: none"> ● recall knowledge based well beyond the directly taught programme ● demonstrate thorough understanding of subject-specific theories, paradigms, concepts and principles as well as in-depth understanding of more specialised areas ● demonstrate the ability to define problems, devise and evaluate possible solutions, and to solve both routine and unfamiliar problems confidently ● seek out, analyse, synthesise, summarise and critically evaluate information ● show a well developed ability to integrate lines of evidence from a wide range of sources to formulate and test hypotheses ● demonstrate the ability to consider issues from a wide range of multidisciplinary and interdisciplinary perspectives and to draw on appropriate concepts and values in arriving at a critical assessment ● demonstrate a highly developed ability for critical appraisal of academic literature and other sources of information.

	Threshold	Typical	Excellent
Practical skills	<ul style="list-style-type: none"> ● plan, conduct and present an independent investigation with significant guidance ● relate investigations to some prior work and reference it appropriately ● use appropriate laboratory and field equipment safely ● apply a range of methods to solve problems ● use technologies to address problems ● describe and record in the field and laboratory ● interpret practical results with guidance ● present results of investigations in a number of formats. 	<ul style="list-style-type: none"> ● plan, conduct and present an independent investigation with some reliance on guidance ● relate investigations to prior work and reference it appropriately; recognise when information is incomplete ● use appropriate laboratory and field equipment competently and safely ● select and apply a range of appropriate methods to solve problems ● use appropriate technology to address problems efficiently ● describe clearly and record accurately in the field and laboratory ● interpret practical results in a logical manner ● present research findings effectively and appropriately in a number of formats. 	<ul style="list-style-type: none"> ● suggest, plan, conduct and present an independent investigation with limited reliance on guidance ● relate investigations to prior work, be aware of recent research developments and reference it appropriately ● use appropriate laboratory and field equipment highly competently and safely ● select, justify and apply a range of appropriate methods to solve challenging problems ● select and use appropriate technology to address problems effectively ● describe adequately and record accurately in the field and laboratory ● interpret practical results perceptively ● present research findings perceptively and effectively in a number of formats.

	Threshold	Typical	Excellent
Numeracy skills	<ul style="list-style-type: none"> ● select an appropriate sampling procedure ● recognise when information is incomplete ● appreciate risk ● process and interpret data ● solve basic numerical problems using appropriate techniques. 	<ul style="list-style-type: none"> ● define a suitable and effective sampling procedure ● recognise incomplete sets of information and propose appropriate solutions ● understand risk ● process and interpret data effectively ● solve a range of numerical problems using appropriate techniques. 	<ul style="list-style-type: none"> ● define a suitable and efficient sampling procedure ● recognise incomplete sets of information and suggest solutions ● understand and quantify risk ● choose appropriate techniques to process data and interpret them effectively ● solve challenging numerical problems using appropriate techniques.
Communication skills	<ul style="list-style-type: none"> ● communicate to a variety of audiences in written, graphical and verbal forms ● make contributions to group discussions ● listen and respond to others. 	<ul style="list-style-type: none"> ● communicate effectively to audiences in written, graphical and verbal forms ● contribute coherently to group discussions ● listen attentively and respond to others. 	<ul style="list-style-type: none"> ● communicate effectively and engagingly to a variety of audiences in written, graphical and verbal forms ● contribute constructively to group discussions ● listen to, evaluate and respond effectively to the views of others.
ICT skills	<ul style="list-style-type: none"> ● use the internet for communication and information retrieval ● handle computer-based information with guidance, using appropriate techniques and software. 	<ul style="list-style-type: none"> ● use the internet critically for communication and information retrieval ● handle computer-based information using appropriate techniques and software. 	<ul style="list-style-type: none"> ● use the internet critically and imaginatively for communication and information retrieval ● handle computer-based information confidently and competently using appropriate techniques and software.
Interpersonal and teamwork skills	<ul style="list-style-type: none"> ● make some contribution to teamwork and goals ● recognise and respect the views of others 	<ul style="list-style-type: none"> ● organise a team effectively ● contribute effectively to teamwork 	<ul style="list-style-type: none"> ● organise and motivate a team effectively ● contribute effectively and enthusiastically to teamwork

	Threshold	Typical	Excellent
Interpersonal and teamwork skills	<ul style="list-style-type: none"> ● reflect on team performance. 	<ul style="list-style-type: none"> ● identify individual and collective goals ● recognise and respect the views of others ● evaluate performance as an individual and team member. 	<ul style="list-style-type: none"> ● identify individual and collective goals and responsibilities ● recognise and respect the views of others ● evaluate performance as an individual and team member, and learn for the future.
Self-management and professional development skills	<ul style="list-style-type: none"> ● recognise the existence of moral and ethical issues associated with the subject ● appreciate the need for professional codes of conduct ● accept some responsibility for their own learning ● identify targets for personal, career and academic development ● be adaptable and have a flexible approach to study and work ● develop some skills necessary for self-managed and lifelong learning (that is, independent study, time management, organisational skills) ● recognise personal strengths and weaknesses. 	<ul style="list-style-type: none"> ● recognise and be able to comment on the moral and ethical issues associated with the subject ● understand and be able to apply professional codes of conduct ● accept responsibility for their own learning ● identify and work towards targets for personal, career and academic development ● take a responsible, adaptable and flexible approach to study and work ● develop the skills necessary for self-managed and lifelong learning (that is, independent study, time management, organisational skills) ● analyse personal strengths and weaknesses. 	<ul style="list-style-type: none"> ● recognise, explain and evaluate the moral and ethical issues associated with the subject ● understand and be able to apply professional codes of conduct ● assume responsibility for their own learning ● identify and work towards ambitious targets for personal, career and academic development ● manage a responsible, adaptable and flexible approach to study and work ● develop the skills necessary for self-managed and lifelong learning (that is, independent study, time management, organisational skills) to an enhanced level ● analyse personal strengths and weaknesses and take account of them.

Table 2: Benchmark standards - subject-specific knowledge and understanding in honours degrees in agriculture, forestry, agricultural science, food sciences and consumer sciences/studies

	Threshold	Typical	Excellent
Subject-specific knowledge and understanding in agriculture and horticulture	<p>Graduates will have some familiarity with the science and management of sustainable production systems which comprise the broad agricultural or horticultural industries within the socio-economic and environmental contexts required by society. They will be able to:</p> <ul style="list-style-type: none"> ● demonstrate some understanding of the scientific factors affecting production ● describe the policy and socio-economic factors which form and influence systems ● understand how production systems can be manipulated and managed ● recognise the ethical implications of production systems ● recognise the needs and requirements of society ● apply this knowledge to a range of routine real-life situations. 	<p>Graduates will have a well-grounded understanding of the science and management of sustainable production systems which comprise the broad agricultural or horticultural industries within the socio-economic and environmental contexts required by society. They will be able to:</p> <ul style="list-style-type: none"> ● demonstrate understanding of the scientific factors limiting production ● understand the policy and socio-economic factors which form and influence systems ● understand how production systems can be improved by manipulation and management ● recognise and address the ethical implications of production systems ● appreciate the needs and requirements of society ● apply this knowledge to a wide range of real-life situations. 	<p>Graduates will have a comprehensive understanding of the biology and management of sustainable production systems which comprise the broad agricultural or horticultural industries within the socio-economic and environmental contexts required by society. They will demonstrate both excellent knowledge of the literature and creative application of the material. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> ● demonstrate understanding of the scientific factors limiting production and their interactions ● understand the policy and socio-economic factors which form and influence systems ● propose improved systems through manipulation and management ● recognise, anticipate and address the ethical implications ● understand, anticipate and address the needs and requirements of society ● apply this knowledge creatively to a wide range of real-life situations.

	Threshold	Typical	Excellent
Subject-specific knowledge and understanding in agriculture and horticulture	<p>Graduates will have some familiarity with the social, economic, legal, scientific and technological principles underlying the business management of farm or horticultural enterprises. They will be able to:</p> <ul style="list-style-type: none"> ● demonstrate limited familiarity with a range of economic and business management theory and techniques ● demonstrate familiarity with relevant policy ● describe some features of the legal and ethical framework applicable to production systems ● apply a limited range of specific scientific and technological processes ● appraise the roles and responsibilities of regulatory and advisory bodies. <p>Graduates will be able to select and apply a limited range of concepts, theories and methods drawn from the constituent disciplines of their degree programme to agricultural or horticultural enterprises. They will be able to:</p> <ul style="list-style-type: none"> ● identify appropriate knowledge 	<p>Graduates will have a well-grounded understanding of the social, economic, legal, scientific and technological principles underlying the business management of farm or horticultural enterprises. They will be able to:</p> <ul style="list-style-type: none"> ● describe and evaluate a wide range of economic and business management theory and techniques ● demonstrate familiarity with relevant policy and understand its aims ● describe and evaluate features of the legal and ethical framework applicable to production systems ● apply and evaluate a range of specific scientific and technological processes ● appraise and evaluate the roles and responsibilities of regulatory and advisory bodies. <p>Graduates will be able to select, apply and evaluate a wide range of concepts, theories and methods drawn from the constituent disciplines of their degree programme to agricultural or horticultural enterprises. They will be able to:</p>	<p>Graduates will have a well-grounded understanding of the social, economic, legal, scientific and technological principles underlying the business management of farm or horticultural enterprises. They will demonstrate both excellent knowledge of theory and techniques and creative application of the material. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> ● describe, evaluate and apply a wide range of economic and business management theory and techniques ● demonstrate familiarity with relevant policy and understand its origins and aims ● describe and evaluate features of the legal and ethical framework applicable to production systems ● apply and evaluate a range of specific scientific and technological processes ● describe and evaluate the roles and responsibilities of regulatory and advisory bodies. <p>Graduates will be able to select, apply and evaluate a wide range of concepts, theories and methods drawn from the constituent disciplines of their degree programme to agricultural or horticultural enterprises. They will demonstrate both an excellent</p>

	Threshold	Typical	Excellent
<p>Subject-specific knowledge and understanding in agriculture and horticulture</p>	<p>bases and some theoretical perspectives</p> <ul style="list-style-type: none"> ● apply limited range of methods to problem evaluation and amelioration. <p>In addition to the acquisition of transferable skills, graduates will be able to:</p> <ul style="list-style-type: none"> ● communicate on a limited range of agricultural or horticultural issues ● describe and apply professional standards and responsibilities in relation to the agricultural or horticultural industry. 	<ul style="list-style-type: none"> ● identify and evaluate appropriate knowledge bases and a range of theoretical perspectives ● apply a range of methods to problem evaluation and amelioration. <p>In addition to the acquisition of transferable skills, graduates will be able to:</p> <ul style="list-style-type: none"> ● communicate effectively on a wide range of agricultural or horticultural issues and review their performance critically ● describe, apply and evaluate professional standards and responsibilities in relation to the agricultural or horticultural industry. 	<p>knowledge of the literature and creative application of the material. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> ● identify and evaluate appropriate knowledge bases and a full range theoretical perspectives ● justify, apply and evaluate a range of methods for problem evaluation and amelioration. <p>Graduates will be able to demonstrate mastery of transferable skills. Additionally, performance will be distinguished by an excellence in their knowledge of the literature and the creative application of the material. They will be able to:</p> <ul style="list-style-type: none"> ● communicate effectively on a wide range of agricultural or horticultural issues and review their performance critically ● interact effectively with and guide professionals from a wide range of cognate disciplines in solving multidisciplinary problems in agriculture and horticulture ● describe, apply and evaluate professional standards and responsibilities in relation to the broader agricultural or horticultural industry

	Threshold	Typical	Excellent
Subject-specific knowledge and understanding in agriculture and horticulture			<ul style="list-style-type: none"> mentor their peers in the concepts, theories and practice of agriculture and horticulture, and its improvement.
Subject-specific knowledge and understanding in the agricultural sciences	<p>In addition to possessing the knowledge, understanding and expertise described on the following pages, graduates will be familiar with one or more of the following subdivisions of applied science:</p> <ul style="list-style-type: none"> applied plant science applied animal science applied microbial science soil science agricultural systems environmental science. <p>Studies in each of these subdivisions will draw on subject material from one or several parent disciplines and reflect it in a manner relevant to applications in agricultural and cognate areas. The content of individual courses will be defined according to local expertise, knowledge, reputation and research interests but all courses will be designed to provide graduates with a balanced awareness of their subject. Expected levels of achievement in the specialism are given below.</p>		

	Threshold	Typical	Excellent
Subject-specific knowledge and understanding in the agricultural sciences	<p>Graduates will have some familiarity and awareness of ethical issues related to agricultural practice, and:</p> <ul style="list-style-type: none"> ● the physical and chemical processes of the biosphere ● the biochemical processes of life ● the flow of energy and cycling of materials within the biosphere ● the organisation of the biosphere and classification of organisms ● evolutionary process and its genetic basis ● the relevance and application of their discipline to the agricultural industry ● the environmental impact and sustainability of agricultural practices ● agricultural production systems ● physiological and nutritional principles of crops and livestock ● global issues in the production, distribution and use of agricultural products ● food quality and safety ● the socio-economic, legal and policy framework for the agricultural industry ● risk assessment, and health and safety issues in agricultural practice. 	<p>Graduates will have a well-grounded understanding of ethical issues related to the use and exploitation of biological entities, and:</p>	<p>Graduates will have a deep and comprehensive understanding of ethical issues related to the use and exploitation of biological entities, and:</p>
	<p>Graduates will:</p> <ul style="list-style-type: none"> ● have achieved a level of specialist knowledge and understanding, allowing them to work adaptably to apply their discipline within the broad agricultural industry or a cognate field of activity ● be able to follow current practice, and adapt to future developments 	<p>With extended knowledge in some areas.</p> <p>Graduates will:</p> <ul style="list-style-type: none"> ● have achieved a level of specialist knowledge and understanding, allowing them to work as subject specialists within the broad agricultural industry or a cognate field of activity ● be able to apply their discipline to solve problems in the 	<p>With significantly extended knowledge in some areas.</p> <p>Graduates will:</p> <ul style="list-style-type: none"> ● have achieved an outstanding level of specialist knowledge and understanding, allowing them to work as subject specialists within the broad agricultural industry or a cognate field of activity ● be able to apply their discipline to solve problems

	Threshold	Typical	Excellent
Subject-specific knowledge and understanding in the agricultural sciences	<ul style="list-style-type: none"> ● be able to comment on the environmental impact and sustainability of agricultural practices. 	<p>agricultural industry</p> <ul style="list-style-type: none"> ● be able to advise on current practice and engage in discourse at a detailed level ● be able to assess the value and application of new research and developments from an informed perspective ● be potentially able to lead developments in their area of specialist knowledge ● be able to evaluate the environmental impact and sustainability of agricultural practices. 	<ul style="list-style-type: none"> ● be able to advise on current practice and engage in discourse at a detailed level ● be able to assess the value and application of new research and developments from an informed perspective ● be able to lead research and developments in their area of specialist knowledge ● be able to evaluate the environmental impact and sustainability of agricultural practices.
Subject-specific knowledge and understanding in food science and technology	<p>Graduates will have some familiarity with the key scientific disciplines relevant to food. They will be able to:</p> <ul style="list-style-type: none"> ● demonstrate some understanding of the chemistry underpinning molecular interactions occurring in foods and food production ● describe key biochemical, chemical, physical and biological factors underlying the synthesis and metabolism of food materials ● describe a limited range of physical properties of food and experimentally determine their values ● explain the role of key nutrients in health. 	<p>Graduates will have a well-grounded understanding of the key scientific disciplines relevant to food. They will be able to:</p> <ul style="list-style-type: none"> ● demonstrate understanding of the chemistry underpinning molecular interactions and the behaviour of components in food materials during processing and storage ● explain biochemical, chemical, physical and biological factors underlying the synthesis and metabolism of food materials ● describe physical properties of food and experimentally determine their values ● explain the role of nutrients in health. 	<p>Graduates will have a comprehensive understanding of the key scientific disciplines relevant to food. They will demonstrate an excellent knowledge of current scientific developments relevant to food. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> ● demonstrate understanding of the chemistry underpinning molecular interactions and the behaviour of components in food materials during processing and storage ● explain biochemical, chemical, physical and biological factors underlying the synthesis and metabolism of food materials ● explain physical properties of food and experimentally

	Threshold	Typical	Excellent
Subject-specific knowledge and understanding in food science and technology	<p>Graduates will be able to assist in the extension of knowledge and understanding of food through a scientific approach. They will be able to:</p> <ul style="list-style-type: none"> ● use appropriate methods of analysis safely for most types of large and small molecules of relevance to food ● explain and undertake standard methods for the detection and enumeration of microorganisms important to the food industry. <p>Graduates will be able to assist in the application and communication of knowledge of food to meet the needs of society, industry and the consumer for sustainable food quality, safety and security of supply. They will be able to:</p> <ul style="list-style-type: none"> ● describe the principles and practice of major food 	<p>Graduates will have a well-grounded ability to extend knowledge and understanding of food through a scientific approach. They will be able to:</p> <ul style="list-style-type: none"> ● use appropriate methods of analysis safely for all types of large and small molecules of relevance to food ● explain and undertake standard methods for the detection and enumeration of microorganisms important to the food industry and undertake appropriate examination of the microbiology of foods. <p>Graduates will have a well-grounded ability to apply and communicate knowledge of food to meet the needs of society, industry and the consumer for sustainable food quality, safety and security of supply. They will be able to:</p> <ul style="list-style-type: none"> ● explain the principles and practice of food processing 	<p>determine their values</p> <ul style="list-style-type: none"> ● explain the role of nutrients in health. <p>Graduates will have a comprehensive ability to extend knowledge and understanding of food through a scientific approach. They will demonstrate an excellent appreciation of areas where scientific knowledge is limited and will be capable of proposing methods for overcoming these deficiencies. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> ● use appropriate methods of analysis safely for all types of large and small molecules of relevance to food ● explain and undertake methods for the detection and enumeration of microorganisms important to the food industry and undertake appropriate examination of the microbiology of foods. <p>Graduates will have a comprehensive ability to apply and communicate knowledge of food to meet the needs of society, industry and the consumer for sustainable food quality, safety and security of supply. They will demonstrate excellent knowledge of the literature, creative application of the material and a</p>

	Threshold	Typical	Excellent
<p>Subject-specific knowledge and understanding in food science and technology</p>	<p>processing operations and food preservation systems</p> <ul style="list-style-type: none"> ● evaluate key aspects of engineering design of food equipment ● explain the role of packaging materials for food products ● apply simple sensory evaluation methods to assess food quality and/or preference ● describe the food law framework within which food businesses operate ● assist in the operation of quality assurance programmes ● describe the risks to health of key chemical contaminants of food ● describe the main aspects of the business environment in which food businesses operate ● explain the importance of hygiene and waste management systems for the food industry 	<p>operations and food preservation systems</p> <ul style="list-style-type: none"> ● evaluate engineering design of food equipment and communicate professionally with specialist food engineers ● explain characteristics and properties of packaging materials for food products and identify appropriate packaging systems ● design, apply and interpret statistically valid sensory evaluation methods to assess food quality and/or preference ● assess the performance of a process and the conformance of food to specifications and legislation ● contribute directly to quality assurance programmes ● describe the risks to health of chemical contaminants of food and outline appropriate methods for risk reduction ● describe the main aspects of the business environment in which food businesses operate and recognise the impact of management principles on the decision making process ● participate in hygiene and waste management systems for the food industry. 	<p>capacity for synthesis. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> ● explain the principles and evaluate the practice of food processing operations and food preservation systems ● evaluate engineering design of food equipment and communicate professionally with specialist food engineers ● explain characteristics and properties of packaging materials for food products and identify appropriate packaging systems ● design, apply and interpret statistically valid sensory evaluation methods to assess food quality and/or preference ● assess the performance of a process and the conformance of food to specifications and legislation ● contribute directly to quality assurance programmes ● evaluate the risks to health of chemical contaminants of food and advise on appropriate methods for risk reduction ● describe the main aspects of the business environment in which food businesses operate and recognise the impact of management principles on the decision-making process

	Threshold	Typical	Excellent
Subject-specific knowledge and understanding in food science and technology			<ul style="list-style-type: none"> participate in hygiene and waste management systems for the food industry.
Subject-specific knowledge and understanding in rural studies	<p>Graduates will have some familiarity with the physical, social, economic and cultural aspects of the rural environment. They will be able to:</p> <ul style="list-style-type: none"> describe the physical characteristics of the rural environment and the factors limiting its development describe the social, economic and cultural basis of the rural community recognise and describe the conflicting elements within the rural economy demonstrate some understanding of the basic economic and biological principles underpinning the various rural industries recognise the social and ethical implications implicit in the management of the rural environment apply this knowledge to a range of routine real-life situations. 	<p>Graduates will have a well-grounded understanding of the physical, social, economic and cultural aspects of the rural environment. They will be able to:</p> <ul style="list-style-type: none"> understand and evaluate the physical characteristics of the rural environment and the factors limiting its development understand and evaluate the social, economic and cultural basis of the rural community evaluate the conflicting elements within the rural economy demonstrate a clear understanding of the economic and biological principles underpinning the various rural industries evaluate the social and ethical implications implicit in the management of the rural environment apply this knowledge to a wide range of real-life situations. 	<p>Graduates will have a comprehensive and deep understanding of the physical, social, economic and cultural aspects of the rural environment. They will demonstrate comprehensive knowledge of relevant literature and be able to apply the material in a creative fashion. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> demonstrate understanding of the complex interactions between the physical characteristics of the rural environment understand the social, economic and cultural basis of the rural community and propose solutions to reconcile conflicting elements apply an understanding of the economic and scientific principles towards the solution of the problems confronting rural industries recognise, anticipate and address the social and ethical implications implicit in the

	Threshold	Typical	Excellent
<p>Subject-specific knowledge and understanding in rural studies</p>	<p>Graduates will have some familiarity with the issues of sustainable development, conservation of biodiversity and landscapes, and environmental protection. They will be able to:</p> <ul style="list-style-type: none"> ● demonstrate some understanding of the legal and planning framework applicable to the rural environment ● describe the basic principles of ecology as applied to human, plant and animal communities ● demonstrate some understanding of the complex ecology of both managed near-natural and natural landscapes ● recognise and understand the concept of sustainability within a variety of contexts ● demonstrate some understanding of the principles of wildlife and landscape conservation within a historical and contemporary context ● identify and describe the roles and responsibilities of statutory, advisory and non-governmental bodies. 	<p>Graduates will have a well-grounded understanding of the issues of sustainable development, conservation of biodiversity and landscapes, and environmental protection. They will be able to:</p> <ul style="list-style-type: none"> ● describe and evaluate the legal and planning framework applicable to the rural environment ● indicate clear understanding of the principles of ecology as applied to human, plant and animal communities ● indicate clear understanding of the complex ecology of both managed near-natural and natural landscapes ● demonstrate familiarity with the concept of sustainability and its practical application in a variety of contexts ● demonstrate familiarity with, and clear understanding of, the principles of wildlife and landscape conservation within a historical and contemporary context 	<p>management of the rural environment</p> <ul style="list-style-type: none"> ● apply this knowledge creatively to a wide range of real-life situations, giving particular attention to the requirements of society and the concept of sustainability. <p>Graduates will have a comprehensive understanding of the issues of sustainable development, conservation and environmental protection. They will demonstrate both excellent knowledge of theory and techniques and creative application of the material. They will be able to:</p> <ul style="list-style-type: none"> ● identify, describe and evaluate the legal and planning framework applicable to the rural environment and demonstrate its practical application ● demonstrate a comprehensive understanding of the principles of ecology as applied to human, plant and animal communities ● indicate an ability to apply an understanding of the complex ecology of managed near-natural and natural landscapes to the solution of practical problems ● critically evaluate and apply a range of models of sustainability in a creative manner

	Threshold	Typical	Excellent
Subject-specific knowledge and understanding in rural studies	<p>Graduates will be familiar with an integrated and holistic view of rural management and will be able to select and apply a limited range of quantitative and qualitative analytical methods. They will be able to:</p> <ul style="list-style-type: none"> ● identify subject-specific knowledge bases and theoretical perspectives ● apply a limited range of statistical and other methods to evaluation and amelioration of problems. 	<ul style="list-style-type: none"> ● identify, describe and evaluate the roles and responsibilities of statutory, advisory and non-governmental bodies. <p>Graduates will understand the concept of an integrated and holistic view of rural management and will be able to select, apply and evaluate a wide range of quantitative and qualitative analytical methods. They will be able to:</p> <ul style="list-style-type: none"> ● identify and evaluate subject-specific knowledge bases and theoretical perspectives ● apply a range of statistical and other methods to the evaluation and amelioration of problems. 	<ul style="list-style-type: none"> ● provide a comprehensive understanding of the principles of wildlife and landscape conservation, and propose appropriate solutions to address conflicts. <p>Graduates will have a comprehensive understanding of the integrated and holistic nature of rural management and will be able to select, apply and evaluate the full range of quantitative and qualitative analytical methods available. They will demonstrate both an excellent knowledge of the literature and creative application of the material. They will be able to:</p> <ul style="list-style-type: none"> ● identify, select and critically evaluate knowledge bases and theoretical perspectives ● apply a wide range of statistical and other methods to the evaluation and amelioration of problems.
Subject-specific knowledge and understanding in forestry	<p>Graduates will have some familiarity with the main scientific and socio-economic principles underlying forestry. They will be able to:</p> <ul style="list-style-type: none"> ● identify the main physical and biological processes that shape the natural world ● identify the economic concepts applicable to natural resource 	<p>Graduates will have a well-grounded understanding of the scientific and socio-economic principles underlying forestry. They will be able to:</p> <ul style="list-style-type: none"> ● explain the physical and biological processes that shape the natural world and their modification by human activity 	<p>Graduates will have a comprehensive understanding of the scientific and socio-economic principles underlying forestry. They will demonstrate excellent knowledge of the literature, creative application of the material, and a capacity for synthesis. This will distinguish the manner in which they:</p>

	Threshold	Typical	Excellent
<p>Subject-specific knowledge and understanding in forestry</p>	<p>management</p> <ul style="list-style-type: none"> describe the main social factors that influence the use of natural resources. <p>Graduates will understand the structure and behaviour of forest ecosystems. They will be able to:</p> <ul style="list-style-type: none"> describe the distribution and main features of the world's forests describe the main physical and biological components of forest environments identify the processes that control the structure and function of forest ecosystems. 	<ul style="list-style-type: none"> explain the economic concepts applicable to natural resource management and apply them in particular situation explain the social factors that influence the use of natural resources and identify the relative importance of different factors in particular situations. <p>Graduates will have a well-grounded understanding of the structure and behaviour of forest ecosystems. They will be able to:</p> <ul style="list-style-type: none"> describe and explain the distribution and features of the world's forests describe the physical and biological components of forest environments and explain how they vary in time and space describe the processes that control the structure and function of forest ecosystems and explain how they vary in time and space. 	<ul style="list-style-type: none"> explain the physical and biological processes that shape the natural world and evaluate their modification by human activity explain the economic concepts applicable to natural resource management and apply them imaginatively in particular situations explain the social factors that influence the use of natural resources and evaluate the relative importance of different factors in particular situations. <p>Graduates will have a comprehensive understanding of the structure and behaviour of forest ecosystems. They will demonstrate excellent knowledge of the literature, creative application of the material, and a capacity for synthesis. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> describe and explain in detail the distribution and features of the world's forests describe the physical and biological components of forest environments and explain how and why they vary in time and space describe the processes that control the structure and function of forest ecosystems and explain how and why they vary in time and space.

	Threshold	Typical	Excellent
Subject-specific knowledge and understanding in forestry	<p>Graduates will understand the main functions and impacts of forests. They will be able to:</p> <ul style="list-style-type: none"> describe some of the multiple benefits that forests provide identify the main effects of forestry on society and the environment identify the main features of forestry policy for a particular country or region. <p>Graduates will understand the meaning and some of the practices of sustainable forest management. They will be able to:</p> <ul style="list-style-type: none"> define sustainability in a forestry context identify the main components of forest planning describe some of the forestry practices used to meet management objectives 	<p>Graduates will have a well-grounded understanding of the functions and impacts of forests. They will be able to:</p> <ul style="list-style-type: none"> explain the multiple benefits that forests provide, and evaluate the relative importance of these benefits in particular situations explain the effects of forestry on society and the environment, and evaluate the relative importance of these effects in particular situations explain how forest policy is developed and delivered, and analyse and describe the forestry policy for a particular country or region. <p>Graduates will have a well-grounded understanding of the meaning and practice of sustainable forest management. They will be able to:</p> <ul style="list-style-type: none"> explain the meaning of sustainability in forestry and evaluate the sustainability of some forestry practices explain the process of forest planning, and describe how 	<p>Graduates will have a comprehensive understanding of the functions and impacts of forests. They will demonstrate excellent knowledge of the literature, creative application of the material, and a capacity for synthesis. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> explain the multiple benefits that forests provide, and evaluate the relative importance of these benefits in particular situations explain the effects of forestry on society and the environment, and evaluate the relative importance of these effects in particular situations explain how forest policy is developed and delivered, and evaluate the forestry policy for a particular country or region. <p>Graduates will have a comprehensive understanding of the meaning and practice of sustainable forest management. They will demonstrate excellent knowledge of the literature, creative application of the material, and a capacity for synthesis. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> explain the meaning of sustainability in forestry and

	Threshold	Typical	Excellent
Subject-specific knowledge and understanding in forestry	<ul style="list-style-type: none"> describe some of the methods used for the economic and environmental appraisal of forestry practices. 	<p>the process is applied in different situations</p> <ul style="list-style-type: none"> explain the forestry practices used to meet different management objectives, and describe how they are applied in particular situations explain the methods used for the economic and environmental appraisal of forestry practices. 	<p>evaluate the sustainability of different forestry practices</p> <ul style="list-style-type: none"> explain the process of forest planning, and evaluate the way in which process is applied in different situations explain and evaluate the forestry practices used to meet different management objectives explain and evaluate the methods used for the economic and environmental appraisal of forestry practices.
Subject-specific knowledge and understanding in consumer sciences/studies	<p>Graduates will have some familiarity with the social, individual and environmental contexts of consumer behaviour. They will be able to:</p> <ul style="list-style-type: none"> describe a limited range of social and individual factors in the formation of consumer knowledge describe a limited range of social and individual factors in consumer attitudes and choices apply this knowledge to a limited range of routine real-life situations. 	<p>Graduates will have a well-grounded understanding of the social, individual and environmental contexts of consumer behaviour. They will be able to:</p> <ul style="list-style-type: none"> describe and evaluate a wide range of social and individual factors in the formation of consumer knowledge describe and evaluate a wide range of social and individual factors in consumer attitudes and choices apply this knowledge to a wide range of real-life situations. 	<p>Graduates will have a comprehensive understanding of the social, individual and environmental contexts of consumer behaviour. They will demonstrate both excellent knowledge of the literature and creative application of the material. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> critically evaluate a wide range of social and individual factors in relation to consumer attitudes and choices in the formation of consumer knowledge; and opportunities for representation and redress analyse and synthesise academic literature and policy documents that seek to influence consumer attitudes, choices and behaviour

	Threshold performance	Typical performance	Excellent performance
<p>Subject-specific knowledge and understanding in consumer sciences/studies</p>	<p>Graduates will have some familiarity with the social, economic, legal, ethical, scientific and technological principles underlying the production of, and access to, consumer goods and services. They will be able to:</p> <ul style="list-style-type: none"> ● describe a limited range of social and economic factors in differential access to goods and services ● describe some features of the legal framework applicable to the production, purchase and quality of consumer goods and services ● apply a limited range of specific scientific and technological processes ● describe the roles and responsibilities of consumer organisations. <p>Graduates will be able to select and apply to consumer issues a limited range of concepts, theories and methods drawn from the</p>	<p>Graduates will have a well-grounded understanding of the social, economic, legal, ethical, scientific and technological principles underlying the production of, and access to, consumer goods and services. They will be able to:</p> <ul style="list-style-type: none"> ● describe and evaluate a wide range of social and economic factors in differential access to goods and services ● describe and evaluate features of the legal framework applicable to the production, purchase and quality of consumer goods and services ● apply and evaluate a range of specific scientific and technological processes ● describe and evaluate the roles and responsibilities of consumer organisations. <p>Graduates will be able to select, apply and evaluate to consumer issues a wide range of concepts, theories and methods drawn from</p>	<p>● apply this knowledge creatively to a wide range of real-life situations.</p> <p>Graduates will have a deep and comprehensive understanding of the social, economic, legal, scientific, ethical and technological principles underlying the production and supply of, and access to, consumer goods and services. They will demonstrate both excellent knowledge of the literature and creative application of the material. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> ● critically discuss a range of social and economic factors in differential access to goods and services ● examine and apply features of the legal framework in relation to the production, quality, advertising and purchase of consumer goods and services ● apply and evaluate a range of specific scientific and technological processes ● evaluate the roles and responsibilities of consumer organisations. <p>Graduates will be able to select, apply and evaluate to consumer issues a wide range of concepts, theories and methods drawn from</p>

	Threshold	Typical	Excellent performance
Subject-specific knowledge and understanding in consumer sciences/studies	<p>constituent disciplines of their degree programme. They will be able to:</p> <ul style="list-style-type: none"> ● identify appropriate knowledge bases and theoretical perspectives ● apply a limited range of methods to problem evaluation and amelioration. <p>In addition to the acquisition of transferable skills, graduates will be able to:</p> <ul style="list-style-type: none"> ● communicate on a limited range of consumer issues ● describe and apply professional standards and responsibilities in relation to work with consumers. 	<p>the constituent disciplines of their degree programme. They will be able to:</p> <ul style="list-style-type: none"> ● identify and evaluate appropriate knowledge bases and theoretical perspectives ● apply a range of methods to problem evaluation and amelioration. <p>In addition to the acquisition of transferable skills, graduates will be able to:</p> <ul style="list-style-type: none"> ● communicate effectively on a wide range of consumer issues and review their own performance critically ● describe, apply and evaluate professional standards and responsibilities in relation to work with consumers. 	<p>the constituent disciplines of their degree programme. They will demonstrate both an excellent knowledge of the literature and creative application of the material. This will distinguish the manner in which they:</p> <ul style="list-style-type: none"> ● identify and evaluate appropriate knowledge bases and theoretical perspectives ● apply a range of methods to problem evaluation and amelioration ● communicate effectively on a wide range of consumer issues and critically review consumer, industry, business and government policies ● evaluate and apply professional standards and responsibilities in relation to work with consumers.

Appendix A: Indicative programme titles

The lists below give indicative programme titles which are (a) likely to fall completely or substantially within this statement, or (b) may fall at the interface with another statement. The lists are not intended to be exhaustive of the range of degree titles that exists currently.

(a) Completely or substantially within this statement

Agricultural botany
Agricultural business management
Agricultural economics
Agricultural sciences
Agriculture
Agriculture with business management
Agroforestry
Agronomy
Animal care
Animal health
Animal health and welfare
Animal nutrition
Animal science
Arboriculture
Arboriculture and amenity forestry
Arboriculture and urban forestry
Consumer behaviour
Consumer science
Consumer studies
Consumer studies and hospitality
Consumer studies and management
Consumer studies and marketing
Consumer studies and retailing
Countryside and environmental management
Countryside management
Crop protection
Crop science
Equine management
Equine science
Equine studies
Food and consumer sciences
Food and consumer studies
Food and nutrition

Food biotechnology
Food design and technology
Food marketing economics
Food microbiology
Food, nutrition and health
Food production
Food production and quality
Food science
Food science and technology
Food studies
Food technology
Food with marketing
Forest and woodland management
Forest management
Forest sciences
Forestry
Forestry and conservation
Forestry and forest products
Horticulture
Organic agriculture
Rural environmental protection
Rural studies
Soil science

(b) At the interface with another statement

Agricultural engineering
Agri-food marketing and business studies
Applied biology
Biotechnology
Business management and marketing for the agricultural industry
Business management and marketing for the food industry
Consumer and management studies (home economics)
Countryside business and development
Ecological agriculture
Economics
Environmental biology
Environmental science
Equine and human sports science
Equine business management and marketing
Food and hospitality management

Food quality and safety management
Food quality with product development and nutrition
Forest products technology with forestry
International agri-business management
Land and estate management
Landscape management
Natural sciences
Nutrition
Nutritional biochemistry
Plant science
Pre-veterinary science
Rural enterprise and land management
Rural environmental sciences
Rural resource management
Social and community forestry

Appendix B: Membership of the review group for the subject benchmark statement for agriculture, horticulture, forestry, food and consumer sciences

Mrs Carol Brennan	Queen Margaret University
Dr Christine Cahalan	University of Wales, Bangor
Professor Ian Connerton	University of Nottingham
Professor Richard Ellis	University of Reading
Professor Phil Garnsworthy	University of Nottingham
Mr Mike Kitson	independent, formerly London Metropolitan University
Mrs Chris Leggate	Scottish Agricultural College
Dr Phil Lyon	University of Umeå, Sweden
Mr Nigel Warner	Royal Agricultural College
Dr Andy Wilcox	Harper Adams University College
Dr Alan Younger	University of Newcastle

Appendix C: Membership of the original benchmarking group for agriculture, horticulture, forestry, food and consumer sciences

Details provided below are as published in the original subject benchmark statement for agriculture, horticulture, forestry, food and consumer science (2002).⁷

Dr Christine Cahalan	University of Wales, Bangor
Mr Alan Costley	Harper Adams University College
Dr David Gray	University of Nottingham
Dr William Hutcheon	Scottish Agricultural College, Aberdeen
Ms Margaret Jepson	Liverpool John Moores University
Professor Philip John	University of Reading
Dr David Jukes	University of Reading
Dr Ara Kanekanian	University of Wales Institute, Cardiff
Dr Karen King	The Queen's University of Belfast
Dr Martin Luck	University of Nottingham
Dr Phil Lyon	University of Dundee
Professor Richard Moore-Colyer	University of Wales, Aberystwyth
Professor Robert Naylor (chair)	University of Aberdeen
Dr Iwan Owen	University of Wales, Aberystwyth
Dr Chris Strugnell	University of Ulster
Mr Nigel Warner	Royal Agricultural College

⁷ Originally published as Agriculture, forestry, agricultural sciences, food sciences and consumer sciences (2002)

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