

Applied Science and Technology SUBJECT REVIEW and REVALIDATION 2014-15

RESPONSE BY THE PROGRAMME TEAM TO THE REVALIDATION REPORT

The revalidation report set four conditions and made seven advisory recommendations in its report of May 2014. The programme team have set out in the following table their response to these conditions and recommendations. The changes made have been incorporated into the Definitive Revalidation Document which will include all revised module descriptors. The revised frameworks for Applied Animal Science, Agricultural Bioscience and Green Technology are included at the end of this document.

Conditions and Recommendations			
CONDITIONS			
Condition A	that all three degrees should create a larger core in the Honours curriculum which more clearly defines the degree and its graduates; the core should be 90 credits consisting of a minimum 45 credits (normally three modules) of taught modules, in addition to the Honours project and dissertation (45 credits).		
Response	Name	Date	Progress
BSc Agricultural Bioscience Three taught modules have been identified as core modules in addition to the Honours project. Core modules are now: Honours Project; Agriculture, Science and Society ¹ ; Plant Biotic Interactions and Animal Disease and Diagnostics ² . Plant Biotic Interactions and Animal Disease and Diagnostics were chosen because these bioscience modules develop knowledge and understanding of topics of relevance to a wide range of careers and higher education pathways and both can be taken without any previous pre-requisite electives. Animal Disease and Diagnostics ensures that all Agricultural Bioscience students further develop their practical laboratory skills in the Honours year. 'Agriculture, Science and Society' provides an opportunity for Honours students to consider broader aspects of the applications of science in the agricultural sector, the impacts these have on the economy, environment and society and the main drivers for advances in agricultural bioscience.	Core Team	19/9/14	Proposed framework agreed, 26/2/14
BSc Green Technology One additional module 'Sustainable Architecture and Engineering' was selected to become Core because this expands the technical knowledge base and practical application skills required of technologists working in the sustainability and renewable energy sectors. Core modules are now: Honours Project; Rural Planning and Environmental Impact Assessment; Innovations in Low Carbon Technology and Sustainable Architecture and Engineering.	Core Team	19/9/14	Proposed framework agreed, 26/2/14

¹ See response to Recommendation E below

² See also response to condition B below

BSc Applied Animal Science Three taught modules have been identified as Core modules in addition to the Honours project. The Core modules, which were suggested by the review panel, were adopted by the Core Team. The Core modules are now: Honours Project; Animal Disease and Diagnostics; Animal Breeding & Genetics and Reproduction and Developmental Biology.		Core Team	1/6/15	Proposed framework agreed, 14/5/14
Condition B	that for Agricultural Bioscience, the Honours core should include at least one module (15 credits) with a plant/crop content and at least one module (15 credits) with an animal/livestock content			
Response		Name	Date	Progress
As outlined in the response to condition A (above) Plant Biotic Interactions was selected as the core Honours plant/crop module and Animal Disease and Diagnostics as the core Honours animal/livestock module.		Core Team	19/9/14	Proposed framework agreed, 26/2/14
Condition C	that all three degrees should include in the Honours year the option for students to select one elective module as a free choice from those on offer at their campus, subject to availability and timetabling			
Response		Name	Date	Progress
Honours electives for all three degrees now include the option for students to study any one year 3 or 4 module available at that campus, subject to timetabling restrictions.		Core Team	19/9/14	Proposed framework agreed, 26/2/14
Condition D	that descriptors should be updated to include: <ul style="list-style-type: none"> • information on the development, and where appropriate the assessment, of core skills and graduate attributes; • details of appropriate reading in refereed journals and review articles; • details on the approaches to learning and teaching which will be employed; • more detail on the assessment methods used; • reading lists separated more clearly into categories of 'required' and 'additional'. 			
Response		Name	Date	Progress
Applied Science Module leaders to reformat their third and fourth year modules according to the template and guidance provided by the Academic Development Manager, Higher Education which takes the guidance implicit in the condition above fully into account.		ADM(HE) PLs and Module leaders	12/9/14 Ongoing	63% of Applied Science and Technology yr 3 and 4 descriptors reformatted 8/8/14. To be completed by 12/9/14
RECOMMENDATIONS				
The panel made the following advisory recommendations (Section 4)				
Recommendation A	that the title Green Technology should be kept under review.			
Response		Name	Date	Progress
Reconsider the Green Technology title as part of Annual Programme Review each year.		CL and Core Team	26/9/14	

Recommendation B	that for Applied Animal Science, it is strongly recommended that the honours core of 45 credits of taught modules should be made up of three specified modules; however, the team may consider giving students a choice of three from five specified modules.		
Response	Name	Date	Progress
The team considered that a fixed core of three modules, as outlined in the response to condition A (above) was most appropriate.	Core Team	1/6/15	Proposed framework agreed, 14/5/14
Recommendation C	that the module 'Lactation and Neonatal Nutrition in Mammals' should be amended to include consideration of artificial rearing systems.		
Response	Name	Date	Progress
To amend the descriptor to include artificial rearing systems. The outcomes are: LO1: Explain the key processes involved in mammogenesis, lactogenesis and galactopoiesis. LO2: Discuss how endocrine, genetic, health and seasonal factors affect natural milk production. LO3: Critically evaluate the complex processes whereby nutrition influences milk composition in ruminants. LO4: Explain the role of neonatal nutrition in ruminant and non-primate monogastric species (birth to weaning). Outcome 3 Neonatal nutrition (birth to weaning) Matching milk to needs of young in a range of non-primate species including ruminants; colostrum composition and importance to neonate; species differences in milk composition; milk let-down and nursing frequency; adverse effects of inadequate milk supply; digestive disorders in milk-fed offspring; artificial rearing systems; weaning process & role of creep feeding.	TM	1/8/14	Artificial rearing systems included in amended descriptor, 1/8/14
Recommendation D	that for Applied Animal Science, further consideration should be given to the development of understanding of livestock production systems throughout the programme.		
Response	Name	Date	Progress
To introduce structured visits to SRUC and commercial farms by year 1 students. Students study Livestock Production Systems in year 2 which includes detailed study of all classes of stock in the commercial context. In addition to these structured visits in year 1 the team consider that this provides adequate foundation for the students' further study in years 3 and 4. Guidance will be provided to module leaders in years 3 and 4 to ensure that the science is underpinned by cross reference to the practical production context.	Core Team TM	22/9/14	Structured visits will commence during the Induction Residential Study Tour

Recommendation E	that for all programmes the team should consider how the students' ability to integrate and synthesise knowledge and information from across a range of subjects in order to critically evaluate topics might be best developed and assessed in each programme at honours level.		
Response	Name	Date	Progress
<p>BSc Agricultural Bioscience A module entitled 'Agriculture, Science and Society' is to be introduced as a core Honours module to develop students' ability to integrate and synthesise knowledge and information from across a range of subjects in order to critically evaluate topics. The module will be student-centred with the students working to collect, collate and synthesise the relevant information on a scientific issue of contemporary relevance in the agricultural sector. Each student will be required to present their chosen issue for open discussion in a seminar.</p> <p>CL to draft, circulate and agree the descriptor for 'Agriculture, Science and Society' with the Core Team</p>	<p>Core team</p> <p>CL</p>	<p>12/9/14</p> <p>29/8/14</p>	<p>The Core Team agreed the introduction of 'Agriculture, Science and Society' to the Honours year, 26/2/14</p>
<p>BSc Green Technology The Honours module 'Innovations in Low Carbon Technology' is designed to develop students' ability to integrate and synthesise knowledge and information from across a range of subjects in order to critically evaluate topics. It provides a forum within which to review and critically analyse new and emerging technologies for their application, state of development, environmental and economic impact. It will attempt to identify disruptive technologies and explore their effects on society, industry and the environment. The module also considers the influence of UK public sector bodies in driving for a low carbon economy and encourages rational discussion of developmental priorities.</p>	Core Team	12/9/14	Core Team reconsidered the curriculum and agreed that there was no need to change the framework. 26/2/14
<p>Applied Animal Science The Animal Disease & Diagnostic module provides the opportunity for students to integrate and synthesise knowledge and information from across a range of subjects in order to critically evaluate topics. The instruments of assessment will be revised to ensure this is fully achieved <i>viz</i> "Results of reports to be discussed with reference to; animal welfare, nutrition, epidemiology, farming systems, pharmacology, legislation, breeding and agricultural policy as appropriate."</p>	<p>Core Team</p> <p>TM</p>	26/2/14	Core Team reconsidered curriculum and agreed that there was no need to change the framework. 26/2/14.
Recommendation F	that for Agricultural Bioscience, the team give further consideration to the inclusion of the Year 3 module 'Experimental and Analytical Techniques' into the core'.		
Response	Name	Date	Progress
'Experimental and Analytical Techniques' is to remain as an elective as it is not required for all progression and career pathways. Students aiming for careers as consultants and technical representatives would gain more by studying other more agricultural electives. The techniques covered in this module are not a prerequisite for any Honours module or for many types of Honours projects. Advisers of Studies to counsel students on elective pathways for different career ambitions.	Core Team	12/9/14	Framework reconsidered by the Core Team, which agreed that the module should stay as an elective. 26/2/14

Recommendation G	For Green Technology, that the team give further consideration to the inclusion of the Year 3 module GIS and Remote Sensing' into the core.		
Response	Name	Date	Progress
<p>'GIS and Remote Sensing' is to remain as an elective as it is not required for all progression and career pathways. For some careers, e.g. as energy advisers, or laboratory-based research positions, other electives would be more useful. 'GIS and Remote Sensing' is not a prerequisite for any Honours module or for many types of Honours projects. Advisers of Studies to counsel students on elective pathways for different career ambitions. If this module became Core, the students' elective choice would be reduced to one, which the team considered to be insufficient.</p>	Core Team		<p>Framework reconsidered by the Core Team, which agreed that the module should stay as an elective. 26/2/14</p>

Applied Animal Science – Post validation framework

Year 1 Applied Animal Science			
All modules are 40 nominal hours M=Mandatory C=Core O=Optional	C/E	SCQF Level	SCQF Credits
Cell Biology Theory and Practice	M	7	8
Biochemistry: Theory and Practice	M	7	8
Environmental Awareness	M	7	8
Information Technology Applications Software 1	M	7	8
Microorganisms: Growth, Activity and Significance	M	7	8
Quality and Health and Safety Systems in Science Industries	M	7	8
Livestock Physiology	C	7	8
Livestock Breeding	C	7	8
Livestock Growth, Health and Welfare	C	7	8
Bioscience: Graded Unit 1	M	7	8
Animal and Plant Cell Culture	C	7	8
Biotechnology: An Introduction	C	7	8
Chemistry & Physics for the Life Sciences	C	7	8
Optional modules - students select two			
Animal Biology	O	7	8
DNA Structure and Function	O	7	8
Plant Growth and Development	O	7	8
Plant Physiology	O	7	8

YEAR 2 Applied Animal Science			
All modules are 40 nominal hours C=Core E=Elective	C/E	SCQF Level	SCQF Credits
DNA Molecular Techniques: Theory and Practice	M	8	16
Immunotechnology: Theory and Practice	M	8	8
Livestock Nutrition	M	8	8
Agroecosystems: Energetic Efficiency	M	8	8
Statistics for Science 2	M	8	8
Business Management: An Introduction	M	7	8
Applied Bioscience Graded Unit 2: Project	M	8	8
Applied Bioscience Graded Unit 3: Examination	M	8	8
Livestock Health: Approaches to Disease Control	C	8	8
Livestock Production Systems	C	7	8
Electives - students select four			
Grass and Fodder Crop Production	E	7	8
Pollution and Waste Management: An Introduction	E	7	8
Ecology and Ecosystems	E	7	8
Animal Behaviour	E	7	8
Animal Welfare	E	7	8
Clinical Microbiology and Epidemiology	E	8	8
Equine Studies: Equine Health	E	7	8

YEAR 3	Core / Elective	SCQF Level	SCQF Credits
Research Skills and Data Analysis	C	9	15
Experimental and Analytical Techniques	C	9	15
Mammalian Growth, Reproduction and Development	C	9	15
Animal Welfare and Behaviour	C	9	15
Lactation and Neonatal Nutrition in Mammals	C	9	15
Pharmacology in Animal Health	C	9	15
Electives: Students select two			
Animal Science and Society	E	9	15
Parasitology	E	9	15
Ecology: Management and Impacts	E	9	15
Management Skills and Entrepreneurship	E	9	15

Exit award: BSc Applied Animal Science

YEAR 4	Core / Elective	SCQF Level	SCQF Credits
Honours Project	C	10	45
Students select two electives: <i>One can be selected from years 3 or 4 of other programmes offered at SRUC Edinburgh, subject to approval and timetables.</i>			
Animal Feed Technology	E	10	15
Animal Breeding and Genetics	C	10	15
Animal Disease and Diagnostics	C	10	15
Reproduction and Developmental Biology	C	10	15
Poultry Meat Production Systems	E	10	15
Molecular Bioscience	E	10	15
Food and Agri-business Economic Policy	E	10	15
Equine Nutrition and Grazing Management	E	10	15

Award: BSc (Hons) Applied Animal Science

BSc Agricultural Bioscience – Post validation framework

In years 1 and 2 there are two streams of study, from which students can exit with either HND Applied Bioscience (App Bios) or HND Agricultural Science (Agric. Sci) after 2 successful years of study.

YEAR 1	C = Core E = Elective	App Bios	Agric Sci	SCQF Level	SCQF Credits
All modules are 40 nominal hours					
Livestock Physiology		C	C	7	8
Livestock Breeding		C	C	7	8
Livestock Growth, Health and Welfare		C	C	7	8
Arable Crop Production		C	C	7	8
Plant Physiology		C	C	7	8
Cell Biology: Theory and Practice		C	C	7	8
Biochemistry: Theory and Practice		C	C	7	8
Biotechnology: An Introduction		C	C	7	8
Chemistry and Physics for the Life Sciences		C	C	7	8
Microorganisms: Growth, Activity and Significance		C	C	7	8
Quality and Health & Safety Systems in Science Industries		C	C	7	8
Environmental Awareness		C	C	7	8
Information Technology Applications Software 1		C	C	7	8
Bioscience Graded Unit 1: Project		C	C	7	8
Electives: Students select one according to study stream					8
Soils and Crop Establishment			E	7	8
Animal and Plant Cell Culture: An Introduction		E		7	8

Award: HNC Bioscience

YEAR 2				
C = Core; E = Elective Students choose 1 elective from 3. All modules are 40 notional hours except for DNA Molecular Techniques: Theory & Practice which is 80	App Bios	Agric Sci	SCQF Level	SCQF Credits
Livestock Nutrition	C	C	8	8
Agroecosystems: Energetic Efficiency	C	C	8	8
Statistics for Science 2	C	C	8	8
Business Management: An Introduction	C	C	7	8
Plant Protection	C	C	7	8
Livestock Health: Approaches to Disease Control	C	C	8	8
Livestock Production Systems	C	C	7	8
Grass and Fodder Crop Production	C	C	7	8
Plant Protection: Integrated Approaches	C	C	8	8
DNA Molecular Techniques: Theory and Practice	C		8	16
Immunotechnology: Theory and Practice	C		8	8
Applied Bioscience Graded Unit Level 8 (Examination)	C		8	8
Applied Bioscience Graded Unit Level 8 (Project)	C		8	8
Soils and Plant Nutrition	E	C	8	8
Biomass: Technologies for Energy and Bioproducts	E		8	8
Pollution and Waste Management: An Introduction	E		7	8
Land Use Systems		C	8	8
Farm Manures, Wastes and the Environment		C	8	8
Agricultural Science: Graded Unit 2: Case Study		C	8	8
Agricultural Science: Graded Unit 3: Examination		C	8	8
Agricultural Produce: Quality and Processing		E	8	8
Farm Scale Renewable Energy		E	8	8
Specialised Field Crops		E	8	8

Award: HND Agricultural Science / HND Applied Bioscience

YEAR 3 Students take 8 modules. <i>C = Core ; E=Elective</i>	Core / Elective	SCQF Level	SCQF Credits
Research Skills and Data Analysis	C	9	15
Livestock Production Technology	C	9	15
Animal Welfare and Behaviour	C	9	15
Crop Growth and Metabolism	C	9	15
New Perspectives in Plant Protection	C	9	15
Students select 3 electives, to include <u>at least one</u> from Group A			
Group A electives	Group A		
Experimental and Analytical Techniques	E	9	15
Livestock Enterprise Management	E	9	15
Crop Products and Potential	E	9	15
Group B electives:	Group B		
Advanced Agronomy	E	9	15
Bioproducts: Technologies and Supply Chains	E	9	15
Parasitology	E	9	15
Food Spoilage, Contamination and Safety	E	9	15
Land-based Environmental Issues	E	9	15
Management Skills & Entrepreneurship	E	9	15

Exit award: BSc Agricultural Bioscience

YEAR 4	C = Core; E=Elective	Core / Elective	SCQF Level	SCQF Credits
Honours Project		C	10	45
Agriculture, Science and Society		C	10	15
Plant Biotic Interactions		C	10	15
Animal Disease and Diagnostics		C	10	15
Electives: Students select two				
Animal Feed Technology		E	10	15
Poultry Meat Production Systems		E	10	15
Plant Responses to Stress		E	10	15
Biotechnology for Crops and Crop Products		E	10	15
Waste Reduction and Recycling		E	10	15
Food and Agri-business Economic Policy		E	10	15
Professional Practice and Business Law for the Land Based Sector		E	10	15
Carbon Management		E	10	15
<i>Any one year 3 or 4 module delivered at the Ayr campus according to timetable constraints</i>		E	9	15

Award: BSc Honours Agricultural Bioscience

BSc Green Technology – Post validation framework

YEAR 1	SCQF Level	SCQF Credits	Core/ Elective
15 Core modules:	7	8	C
Arable Crop Production	7	8	C
Biochemistry: Theory and Practice	7	8	C
Cell Biology: Theory and Practice	7	8	C
Chemistry and Physics for the Life Sciences	7	8	C
Crop Protection and Harvesting Mechanisation	7	8	C
Environmental Awareness	7	8	C
Farm Power	7	8	C
Fundamentals of Landscape Surveying	7	8	C
Information Technology Applications Software 1	7	8	C
Microorganisms: Growth, Activity and Significance	7	8	C
Plant Physiology	7	8	C
Quality and Health & Safety Systems in Science Industries	7	8	C
Small Scale Rural Electrical Energy Systems	7	8	C
Soils and Crop Establishment	7		C
Graded Unit (Case Study)	7	8	C

Award: HNC Bioscience

YEAR 2	SCQF Level	SCQF Credits	Core/ Elective
12 Core modules			
Agroecosystems: Energetic Efficiency	8	8	C
Biomass: Technologies for Energy and Bioproducts	8	8	C
Business Management: An Introduction	7	8	C
Energy Performance of Buildings	8	8	C
Farm Scale Renewable Energy	8	8	C
Land Use Systems	8	8	C
Pollution and Waste Management: An introduction	7	8	C
Renewable Energy Systems: Microgeneration Systems	7	8	C
Statistics for Science 2	8	8	C
Transport Towards a Sustainable Future	8	8	C
Green Technology Graded Unit (Case Study)	8	8	C
Green Technology Graded Unit (Examination)	8	8	C
Elective modules – students choose 3			
Environmental Auditing of Buildings	8	8	C
Farm Buildings and Controlled Environments	8	8	C
Low Environmental Impact Construction	8	8	C
Mathematics for Construction Engineering	7	8	C
Scottish Rural Development	7	8	C

Award: HND Green Technology

YEAR 3	Core/ Elective	SCQF Level	SCQF Credits
Existing Framework <i>All modules are SCQF Level 9 and 15 SCQF Credits</i>			
6 Core modules			
Bioenergy Production Technology	C	9	15
Bioproducts: Technologies and Supply Chains	C	9	15
Project Management	C	9	15
Renewable Case Study	C	9	15
Renewables Technology	C	9	15
Research Skills and Data Analysis	C	9	15
Students select 2 electives:			
Climate Change and the Global Environment	E	9	15
Crop Products and Potential	E	9	15
Economic Policy and Analysis	E	9	15
Experimental and Analytical Techniques	E	9	15
GIS and Remote Sensing	E	9	15
Land and Habitat Restoration	E	9	15
Management Skills and Entrepreneurship	E	9	15
Multi-purpose Woodland Management	E	9	15

Award: BSc Green Technology

YEAR 4	Core/ Elective	SCQF Level	SCQF Credits
3 Core modules			
Honours Project	C	10	45
Rural Planning and Environmental Impact Assessment	C	9	15
Innovations in Low Carbon Technology	C	10	15
Sustainable Architecture and Engineering	C	10	15
Students select 2 electives.			
Advanced Multi-purpose Woodland Management	E	10	15
Environmental Economics	E	10	15
Sustainable Environmental Management	E	10	15
Food and Agri-business Economic Policy	E	10	15
Waste Reduction and Recycling	E	10	15
Carbon Management	E	10	15
Professional Practice and Business Law for the Land Based Sector	E	10	15
Any one year 3 or 4 module available at the Ayr campus subject to timetabling constraints	E	9 or 10	15

Award: BSc (Hons) Green Technology