



UNIVERSITY OF LINCOLN

Programme Specification

Title:

Biology

Final Award: **Bachelor of Science with Honours (BSc (Hons))**

With Exit Awards at:

Certificate of Higher Education (CertHE)

Diploma of Higher Education (DipHE)

Bachelor of Science with Honours (BSc (Hons))

To be delivered from: 18 Feb 2017

Level	Date
Level 1 or Certificate of Higher Education (CertHE)	2018-19
Level 2 or Diploma of Higher Education (DipHE)	2019-20
Level 3 or Bachelor of Science with Honours (BSc (Hons))	2020-21

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1. Introduction

This document describes one of the University of Lincoln's programmes using the protocols required by the UK National Qualifications Framework as defined in the publication *QAA guidelines for preparing programme specifications*.

This programme operates under the policy and regulatory frameworks of the University of Lincoln.

2. Basic Programme Data

Final Award:	Bachelor of Science with Honours (BSc (Hons))
Programme Title:	Biology
Exit Awards and Titles	Certificate of Higher Education (CertHE) Diploma of Higher Education (DipHE) Bachelor of Science with Honours (BSc (Hons))
Subject(s)	Biology
Mode(s) of delivery	Full Time
Is there a Placement or Exchange?	Yes
UCAS code	C100
Awarding Body	University of Lincoln
Campus(es)	Lincoln Campus
School(s)	School of Life Sciences
Programme Leader	Adrian Goodman (agoodman)
Relevant Subject Benchmark Statements	
Professional, Statutory or Regulatory Body Accreditation	
Programme Start Date	2018-19

3. Programme Description

3.1 Overview

This BSc (Hons) Biology is designed to meet the needs of students who want to gain knowledge and understanding of the breadth of modern biology within an academically challenging yet supportive research-led environment. Our aim is to produce confident, knowledgeable and questioning graduates with the skills and experience needed for a wide range of careers. This broad-based Biology programme builds on the success of the more specialist biosciences programmes currently offered within the University of Lincoln and includes teaching from ecology, agriculture, biochemistry, molecular biology, animal science, forensic and biomedical sciences. Students will be expected to integrate information and concepts from the breadth of biology, but will be given opportunities to develop specialist interests in their final year, as this will enhance their employability in certain sectors. Teaching and learning methods will include some conventional lectures and practical classes, which cover the core subject matter and technical skills, supported by tutorials and seminars which allow students to develop, analyse and present their own findings. Practical classes in laboratory and field allow students to practise project management and data gathering, handling and interpretation skills. All students will have the opportunity to conduct some original research in their final year research project, and will have opportunities to direct their curriculum at other points in the syllabus. A varied assessment diet has been designed to encourage and test the development of the skills and knowledge needed in their future careers. Students will be supported throughout their degree by a personal tutoring system.

3.2 Aims and Objectives

This programme aims to equip students with skills, knowledge and confidence necessary to pursue graduate careers in the biological sciences or other areas requiring graduates with strong analytical, communication and enquiry skills. This will be achieved by providing students with an educational framework in which they can develop their knowledge and understanding of the fundamental principles of biology in a context where skills development is encouraged and supported as an integral part of the academic experience. Students will be encouraged to learn independently and to pursue areas they find particularly interesting in an enquiry-based approach.

3.3 Variations to Standard Regulations and Guidance

None

4. Programme Outcomes

Programme-level learning outcomes are identified below.

Refer to *Appendix I – Curriculum Map* for details of how outcomes are deployed across the programme.

4.1 Knowledge and Understanding

On successful completion of this programme a student will have knowledge and understanding of:

- 1 Molecular Biology: describe the basic reactions of life and major molecules of life especially DNA, RNA and key proteins and understand the relevance of this information to every aspect of biology
- 2 Cells: Demonstrate an understanding of the structure and function of various types of cells in unicellular and multicellular organisms, the structure and function of cell membranes
- 3 Understanding of the key metabolic and catabolic reactions of plants and animals, and how they are controlled
- 4 Genetics: underpinning importance of genetics as the key to modern biology including the potential for genomics and other 'omics' technologies to advance our knowledge and provide solutions to problems
- 5 Evolution: understand the fundamental process of natural selection and why it is the major conceptual advance that allows us to understand life
- 6 Behaviour: as response of organism to external and internal stimuli but understood within the interdisciplinary context of evolution, cell biology, physiology and ecology
- 7 Growth and reproduction relate to genetics, physiology, including nutrition, and environment, and influence everything (from food production to environmental degradation to disease to evolution and more)!
- 8 Ecology and biodiversity: understand that all organisms live within and are adapted to the wider environment containing biotic and abiotic components, and that biodiversity is unevenly distributed. Understand the crucial role that diverse organisms play in regulating ecosystem functions and how these might be threatened by anthropogenic change
- 9 Biology is interdisciplinary and ever-changing – hypotheses can only ever be refined – and knowledge is rarely fixed
- 10 Change and scale – the world is changing and always has been – but scale and pace of anthropogenic scale is novel and has the potential to fundamentally change the biology of the planet
- 11 Demonstrate a thorough and critical knowledge of the primary literature and cutting-edge research questions in several areas of specialism as presented in final year modules.

4.2 Subject Specific Intellectual Skills

On successful completion of this programme a student will be able to:

- 12 Design, manage, monitor, present and analyse critically research project work

- 13 Formulate hypotheses and design appropriate experiments and projects to test them
- 14 Demonstrate an understanding of key ethical issues relating to modern biology
- 15 Acquire, evaluate, process, interpret and criticise information, conclusions and opinions from scientific publications and press and other media reports
- 16 Demonstrate the ability to think independently

4.3 Subject Specific Practical Skills

On successful completion of this programme a student will be able to:

- 17 Work safely and effectively in the field, in laboratories and in animal facilities
- 18 Demonstrate competence in handling and statistical analysis of data gained from practical work

4.4 Transferable Skills and Attributes

On successful completion of this programme a student will be able to:

- 19 Clear oral and written communication of scientific information to audiences with different levels of background knowledge
- 20 Numeracy and ability to apply numeracy skills to a wide range of situations, including abstract application of simple mathematical models
- 21 Competence in relevant information technology as needed for career path and confident about own ability to learn new IT skills within a rapidly changing environment
- 22 Problem solving and critical analysis of own work, with effective personal time management
- 23 Team-work and working with others on projects, including demonstrating leadership as appropriate
- 24 Positive and effective strategies to support life-long learning
- 25 Confidence and self-awareness and ability to evaluate own strengths and weaknesses in the context of particular career choices

For details of each module contributing to the programme, please consult the module specification document.

5. Learning, Teaching and Assessment Strategies

5.1. Learning and Teaching Strategy

The programme ensures compliance with the Framework for Higher Education Qualifications in the following ways (quotations are from <http://www.qaa.ac.uk/en/Publications/Documents/qualifications-frameworks.pdf>)

Those completing their studies at Certificate or Intermediate levels will have acquired, respectively, “sound knowledge of the basic concepts” and “sound understanding of the principles” of Biology. Honours graduands “will have developed an understanding of a complex body of knowledge, some of it at the boundaries [of the subject area]”. The syllabus aims to provide this knowledge, capitalising upon the research activity of the teaching staff. The syllabus is also designed to develop the “analytical techniques and problem-solving skills” relevant to graduate-level employment. The curriculum is designed to enable students to demonstrate the attributes tabulated in Annex 1 of the Framework text.

Learning and Teaching Strategy:

The overarching strategy for learning and teaching at the University of Lincoln is for students to be supported and encouraged to see themselves as producers of knowledge and collaborators in their learning experience. This is particularly emphasised in students’ practical classes which are designed to develop their research skills via enquiry based learning. Electronically delivered module support and assessment will be a key additional tool to help develop the student learning experience. This ethos should be experienced throughout the Biology Degree programme but will be particularly stressed in a number of key modules including Integrative Biochemistry, Plant Structure and Function, Research Methods for Life Sciences II, Ecology, Plant-Animal Interactions, Overseas Field Course, Current Issues in Life Sciences and Life Sciences Research Project.

Lectures introduce key topics in the subject area and guide students’ independent study. Practicals will allow students to develop laboratory skills and skills in fieldwork, surveying, data handling and processing, as well as to encounter at first hand the principles introduced in the lectures. Students will also have opportunity to develop their own interests through self-guided research skills, as library based study and background research and project work. Seminars and small group tutorials will be used to facilitate class discussion. There will be site visits and lectures by external specialists to provide opportunities to meet employed biologists and employers of biologists. Reference will be made to the practical application of principles and the development of graduate skills will be included in subject specific units.

Students on the biology programme will be allocated to a personal academic tutor who will support them throughout their studies. This person will guide them during timetabled tutorials in the first year module Research Methods for Life Scientists I, ensuring they develop sound study practice from their first term at Lincoln. Their academic tutor will be available for advice (including pastoral advice) and guidance at all key academic decision points during the degree and help them to develop a career plan based on the skills and attributes they have acquired during their degree.

For details of each module contributing to the programme, please consult the module specification document. For award of the title BSc (Hons) Biology (Sandwich) a 48 week placement would be completed between Intermediate and Honours level.

If a student were to withdraw, leave or be terminated from any work placement that the University recognises as constituting a year out within industry, then the respective student is expected to

provide an alternative means to support themselves until their return to the University at the start of the next academic year. The University holds no responsibility in finding or providing an additional placement nor living costs associated with the withdrawal or loss of any industrial work placements. Moreover, a student who fails to successfully complete the placement could still achieve a BSc (Hons) in their programme of study if continuing (and successful in completing) their final year. Alternatively a student may opt to exit the programme leaving with the appropriate exit award for the subject.

5.2. Assessment Strategy

Assessment is varied to allow for the development and testing of all the skills listed as programme outcomes as well as the relevant knowledge and will include unseen examinations and coursework. Coursework will include laboratory exercises or reports, case studies, problem solving exercises, essays, poster or oral group presentations, short answer and structured questions and project reports.

All assessment will have a formative element as well as a summative element and feedback will be prompt and designed to enhance student skills. Assessment criteria will be made clear to students when the assignment is allocated at the start of the term in which the module is taught.

The use of technology is embedded within the learning process via our Virtual Learning Environment, Blackboard. Student electronic communities are used to facilitate communication and wikis are used to encourage students to develop their own shared learning resources.

6. Programme Structure

The total number of credit points required for the achievement of Certificate of Higher Education (CertHE) is 120.

The total number of credit points required for the achievement of Diploma of Higher Education (DipHE) is 240.

The total number of credit points required for the achievement of Bachelor of Science with Honours (BSc (Hons)) is 360.

Level 1

Title	Credit Rating	Core / Optional
Cell Biology 2018-19	15	Core
Ecology 2018-19	15	Core
Integrative Biochemistry 2018-19	15	Core
Integrative Biochemistry 2 2018-19	15	Core
Research Methods for Life Scientists 1 2018-19	15	Core
Genetics 2018-19	15	Core
Comparative Form and Function in Animals 2018-19	15	Core
Plant Structure and Function 2018-19	15	Core

Level 2

Title	Credit Rating	Core / Optional
Molecular Biology 2019-20	15	Core
Research Methods for Life Scientists 2 2019-20	15	Core
Immunology 2019-20	15	Optional
Animal Behaviour 2019-20	15	Optional
Plant-Animal Interactions 2019-20	15	Core
Conservation Biology 2019-20	15	Core
Reproduction and Development 2019-20	15	Optional
Work Experience 2019-20		Optional
Biomolecules 2019-20	15	Optional
Biology of Human Disease 2019-20	15	Optional
Animal Health and Disease 2019-20	15	Optional
Biological Analysis 2019-20	15	Optional
Animal Nutrition 2019-20	15	Optional
Invertebrate Zoology 2019-20	15	Optional
Evolution 2019-20	15	Optional

Level 3

Title	Credit Rating	Core / Optional
Infection Sciences 2020-21	15	Optional
Behavioural Ecology 2020-21	15	Optional
Overseas Field Course 2020-21	15	Optional
Genetics & Bioethics 2020-21	15	Optional
Introduction to Forensic Anthropology 2020-21	15	Optional
Animal Population Genetics 2020-21	15	Optional
Current Issues in Life Sciences 2020-21	15	Core

Integrative Ecology 2020-21	15	Core
Life Sciences Research Project 2020-21	30	Core
Haematology 2020-21	15	Optional
Biotechnology 2020-21	15	Optional
Animal Cognition 2020-21	15	Optional
Palaeobiology 2020-21	15	Optional
Veterinary Parasitology 2020-21	15	Optional
Cellular Pathology 2020-21	15	Optional
Transfusion & Transplantation 2020-21	15	Optional

Appendix I - Curriculum Map

This table indicates which modules assume responsibility for delivering and ordering particular programme learning outcomes.

Key: Delivered and Assessed Delivered Assessed

Level 1

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Cell Biology 2018-19		<input checked="" type="checkbox"/>										
Comparative Form and Function in Animals 2018-19						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
Ecology 2018-19					<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>				
Genetics 2018-19	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>					
Integrative Biochemistry 2 2018-19	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>									
Integrative Biochemistry 2018-19	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>									
Plant Structure and Function 2018-19		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>				
Research Methods for Life Scientists 1 2018-19												<input checked="" type="checkbox"/>

	PO13	PO14	PO15	PO16	PO17	PO18	PO19	PO20	PO21	PO22	PO23	PO24
Cell Biology 2018-19					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>					
Comparative Form and Function in Animals 2018-19							<input checked="" type="checkbox"/>					
Ecology 2018-19					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>					
Genetics 2018-19					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Integrative Biochemistry 2 2018-19					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Integrative Biochemistry 2018-19					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Plant Structure and Function 2018-19							<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
Research Methods for Life Scientists 1 2018-19	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

	PO25
Cell Biology 2018-19	
Comparative Form and Function in Animals 2018-19	
Ecology 2018-19	
Genetics 2018-19	
Integrative Biochemistry 2 2018-19	
Integrative Biochemistry 2018-19	
Plant Structure and Function 2018-19	
Research Methods for Life Scientists 1 2018-19	✓

Level 2

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Animal Behaviour 2019-20						✓						
Animal Health and Disease 2019-20		✓					✓					
Animal Nutrition 2019-20			✓		✓	✓	✓					
Biological Analysis 2019-20												
Biology of Human Disease 2019-20		✓	✓									
Biomolecules 2019-20	✓	✓	✓									
Conservation Biology 2019-20							✓	✓			✓	✓
Evolution 2019-20					✓		✓		✓			✓
Immunology 2019-20		✓	✓									
Invertebrate Zoology 2019-20						✓		✓				
Molecular Biology 2019-20	✓			✓								
Plant-Animal Interactions 2019-20					✓	✓			✓			
Reproduction and Development 2019-20							✓					
Research Methods for Life Scientists 2 2019-20									✓			✓
Work Experience 2019-20												

PO13	PO14	PO15	PO16	PO17	PO18	PO19	PO20	PO21	PO22	PO23	PO24

Animal Behaviour 2019-20						✓	✓	✓				
Animal Health and Disease 2019-20												
Animal Nutrition 2019-20			✓	✓			✓			✓		
Biological Analysis 2019-20			✓		✓	✓	✓	✓		✓		
Biology of Human Disease 2019-20			✓				✓					
Biomolecules 2019-20									✓			
Conservation Biology 2019-20							✓					
Evolution 2019-20			✓				✓					
Immunology 2019-20						✓	✓					
Invertebrate Zoology 2019-20				✓						✓		
Molecular Biology 2019-20							✓					
Plant-Animal Interactions 2019-20	✓			✓			✓					✓
Reproduction and Development 2019-20							✓					
Research Methods for Life Scientists 2 2019-20	✓	✓		✓		✓	✓	✓	✓			✓
Work Experience 2019-20												

PO25

Animal Behaviour 2019-20												
Animal Health and Disease 2019-20												
Animal Nutrition 2019-20												
Biological Analysis 2019-20												
Biology of Human Disease 2019-20												
Biomolecules 2019-20												
Conservation Biology 2019-20												
Evolution 2019-20												
Immunology 2019-20												
Invertebrate Zoology 2019-20												
Molecular Biology 2019-20												
Plant-Animal Interactions 2019-20												
Reproduction and Development 2019-20												
Research Methods for Life Scientists 2 2019-20												
Work Experience 2019-20												

Level 3

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Animal Cognition 2020-21						✓				✓	✓	
Animal Population Genetics 2020-21	✓				✓			✓				
Behavioural Ecology 2020-21					✓	✓		✓	✓			
Biotechnology 2020-21	✓										✓	✓
Cellular Pathology 2020-21											✓	
Current Issues in Life Sciences 2020-21									✓	✓	✓	
Genetics & Bioethics 2020-21				✓	✓				✓			
Haematology 2020-21		✓	✓	✓								
Infection Sciences 2020-21		✓		✓			✓					
Integrative Ecology 2020-21					✓			✓			✓	
Introduction to Forensic Anthropology 2020-21							✓		✓			
Life Sciences Research Project 2020-21									✓		✓	✓
Overseas Field Course 2020-21								✓	✓	✓	✓	✓
Palaeobiology 2020-21					✓	✓	✓	✓	✓	✓	✓	✓
Transfusion & Transplantation 2020-21				✓			✓				✓	
Veterinary Parasitology 2020-21	✓			✓	✓	✓		✓			✓	✓

	PO13	PO14	PO15	PO16	PO17	PO18	PO19	PO20	PO21	PO22	PO23	PO24
Animal Cognition 2020-21			✓				✓					
Animal Population Genetics 2020-21							✓					
Behavioural Ecology 2020-21							✓					
Biotechnology 2020-21			✓			✓	✓					
Cellular Pathology 2020-21			✓	✓		✓	✓			✓		
Current Issues in Life Sciences 2020-21			✓				✓			✓		
Genetics & Bioethics 2020-21		✓				✓	✓					
Haematology 2020-21			✓				✓			✓		

Infection Sciences 2020-21			✓				✓					
Integrative Ecology 2020-21	✓						✓					
Introduction to Forensic Anthropology 2020-21							✓					
Life Sciences Research Project 2020-21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Overseas Field Course 2020-21	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Palaeobiology 2020-21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Transfusion & Transplantation 2020-21		✓	✓	✓			✓			✓		
Veterinary Parasitology 2020-21	✓	✓	✓	✓		✓	✓			✓		

PO25

Animal Cognition 2020-21	
Animal Population Genetics 2020-21	
Behavioural Ecology 2020-21	
Biotechnology 2020-21	
Cellular Pathology 2020-21	
Current Issues in Life Sciences 2020-21	
Genetics & Bioethics 2020-21	
Haematology 2020-21	
Infection Sciences 2020-21	
Integrative Ecology 2020-21	
Introduction to Forensic Anthropology 2020-21	
Life Sciences Research Project 2020-21	✓
Overseas Field Course 2020-21	
Palaeobiology 2020-21	
Transfusion & Transplantation 2020-21	
Veterinary Parasitology 2020-21	

Appendix II - Assessment Map

This table indicates the spread of assessment activity across the programme. Percentages indicate assessment weighting.

Level 1

	01	02	03	04	05	06	07	08	09	10	11	12
Cell Biology 2018-19									50			
Comparative Form and Function in Animals 2018-19												
Ecology 2018-19												
Genetics 2018-19												
Integrative Biochemistry 2 2018-19												
Integrative Biochemistry 2018-19								50				
Plant Structure and Function 2018-19												
Research Methods for Life Scientists 1 2018-19										50		50
	13	14	15	16	17	18	19	20	21	22	23	24
Cell Biology 2018-19		50										
Comparative Form and Function in Animals 2018-19	50			50								
Ecology 2018-19										10		
Genetics 2018-19												50
Integrative Biochemistry 2 2018-19												
Integrative Biochemistry 2018-19		50										
Plant Structure and Function 2018-19												
Research Methods for Life Scientists 1 2018-19												
	25	26	27	28	29	30	31	32	33	34	35	36
Cell Biology 2018-19												

Plant Structure and Function 2018-19

Research Methods for Life Scientists 1 2018-19

Level 2

	01	02	03	04	05	06	07	08	09	10	11	12
Animal Behaviour 2019-20												
Animal Health and Disease 2019-20												50
Animal Nutrition 2019-20												
Biological Analysis 2019-20					50							
Biology of Human Disease 2019-20												
Biomolecules 2019-20							50					
Conservation Biology 2019-20												
Evolution 2019-20												
Immunology 2019-20												
Invertebrate Zoology 2019-20												
Molecular Biology 2019-20							50					
Plant-Animal Interactions 2019-20												
Reproduction and Development 2019-20												
Research Methods for Life Scientists 2 2019-20										50		50
Work Experience 2019-20												

	13	14	15	16	17	18	19	20	21	22	23	24
Animal Behaviour 2019-20						50						50
Animal Health and Disease 2019-20				50								
Animal Nutrition 2019-20								50				50
Biological Analysis 2019-20												
Biology of Human Disease 2019-20						50						
Biomolecules 2019-20		50										
Conservation Biology 2019-20									30			

Evolution 2019-20	50			50								
Immunology 2019-20							50					
Invertebrate Zoology 2019-20	60	40										
Molecular Biology 2019-20												
Plant-Animal Interactions 2019-20					50							50
Reproduction and Development 2019-20						50						50
Research Methods for Life Scientists 2 2019-20												
Work Experience 2019-20												
	25	26	27	28	29	30	31	32	33	34	35	36
Animal Behaviour 2019-20												
Animal Health and Disease 2019-20												
Animal Nutrition 2019-20												
Biological Analysis 2019-20												
Biology of Human Disease 2019-20												
Biomolecules 2019-20												
Conservation Biology 2019-20		30									40	
Evolution 2019-20												
Immunology 2019-20												
Invertebrate Zoology 2019-20												
Molecular Biology 2019-20												
Plant-Animal Interactions 2019-20												
Reproduction and Development 2019-20												
Research Methods for Life Scientists 2 2019-20												
Work Experience 2019-20												
	37	38	39	40	41	42	43	44	45	46	47	48
Animal Behaviour 2019-20												
Animal Health and Disease 2019-20												
Animal Nutrition 2019-20												
Biological Analysis 2019-20												

Level 3

	01	02	03	04	05	06	07	08	09	10	11	12
Animal Cognition 2020-21						40						60
Animal Population Genetics 2020-21							20					30
Behavioural Ecology 2020-21												
Biotechnology 2020-21							40					
Cellular Pathology 2020-21												
Current Issues in Life Sciences 2020-21												
Genetics & Bioethics 2020-21												100
Haematology 2020-21												50
Infection Sciences 2020-21												
Integrative Ecology 2020-21												
Introduction to Forensic Anthropology 2020-21										50		50
Life Sciences Research Project 2020-21												
Overseas Field Course 2020-21	20											
Palaeobiology 2020-21												
Transfusion & Transplantation 2020-21												
Veterinary Parasitology 2020-21								50				50
	13	14	15	16	17	18	19	20	21	22	23	24
Animal Cognition 2020-21												
Animal Population Genetics 2020-21				50								
Behavioural Ecology 2020-21											40	
Biotechnology 2020-21	60											
Cellular Pathology 2020-21										50		
Current Issues in Life Sciences 2020-21											50	50
Genetics & Bioethics 2020-21												
Haematology 2020-21				50								

Infection Sciences 2020-21									50			
Integrative Ecology 2020-21	50			50								
Introduction to Forensic Anthropology 2020-21												
Life Sciences Research Project 2020-21										75		25
Overseas Field Course 2020-21				80								
Palaeobiology 2020-21												
Transfusion & Transplantation 2020-21											50	
Veterinary Parasitology 2020-21												
	25	26	27	28	29	30	31	32	33	34	35	36
Animal Cognition 2020-21												
Animal Population Genetics 2020-21												
Behavioural Ecology 2020-21												
Biotechnology 2020-21												
Cellular Pathology 2020-21												
Current Issues in Life Sciences 2020-21												
Genetics & Bioethics 2020-21												
Haematology 2020-21												
Infection Sciences 2020-21												
Integrative Ecology 2020-21												
Introduction to Forensic Anthropology 2020-21												
Life Sciences Research Project 2020-21												
Overseas Field Course 2020-21												
Palaeobiology 2020-21							50					
Transfusion & Transplantation 2020-21												
Veterinary Parasitology 2020-21												
	37	38	39	40	41	42	43	44	45	46	47	48
Animal Cognition 2020-21												
Animal Population Genetics 2020-21												
Behavioural Ecology 2020-21												

Palaeobiology 2020-21						50
Transfusion & Transplantation 2020-21						50
Veterinary Parasitology 2020-21						

Appendix III - Benchmark Analysis

This table maps programme learning outcomes to relevant QAA subject benchmark statements or PSRB guidelines.

Knowledge and Understanding

	BSciEcol1	BSciEcol2	BSciEcol3	BSciEcol4	BSciEcol5	BSciEcol6	BSciEcol7	BSciEcol8	BSciEcol9
PO1									
PO2									
PO3									
PO4					✓				
PO5			✓						
PO6									
PO7		✓					✓	✓	
PO8	✓		✓	✓	✓	✓	✓	✓	
PO9									
PO10	✓		✓				✓	✓	
PO11									

	BSciEcol10	BSciEcol11	BSciEcol12	BSciEcol13	BSciEcol14	BSciEcol15	BSciEcol16	BSciEcol17	BSciEcol18
PO1									
PO2									
PO3									
PO4									
PO5									
PO6									
PO7									✓
PO8		✓	✓	✓	✓	✓	✓	✓	✓
PO9									
PO10									
PO11									

	BSciEcol19	BSciEcol20	BSciGen1	BSciGen2	BSciGen3	BSciGen4	BSciGen5	BSciGen6	BSciGen7
PO1				✓					
PO2									
PO3									
PO4									
PO5				✓					
PO6									
PO7									
PO8	✓	✓							
PO9	✓	✓			✓	✓			
PO10		✓		✓					
PO11	✓		✓			✓			

	BSciGen8	BSciGen9	BSciGen10	BSciGen11	BSciGen12	BSciGen13	BSciGen14	BSciGen15	BSciGen16
PO1	✓	✓							
PO2						✓			
PO3									
PO4	✓								
PO5						✓			
PO6									
PO7									
PO8						✓			
PO9								✓	
PO10									✓
PO11		✓							✓

	BSciGen18	BSciMolec1	BSciMolec2	BSciMolec3	BSciMolec4	BSciMolec5	BSciMolec6	BSciMolec7	BSciMolec8
PO1			✓	✓	✓				✓
PO2		✓						✓	
PO3			✓	✓				✓	
PO4					✓	✓			
PO5									
PO6									

PO7						✓			
PO8									
PO9									
PO10									
PO11									

	BSciMolec9	BSciMolec1 0	BSciMolec1 1	BSciMolec1 2	BSciMolec1 3	BSciMolec1 4	BSciMolec1 5	BSciMolec1 6	BSciMolec1 7
PO1	✓	✓	✓	✓		✓			✓
PO2				✓	✓				
PO3		✓				✓	✓		
PO4			✓	✓					✓
PO5									
PO6									
PO7									
PO8					✓				
PO9									
PO10									
PO11			✓						

	BSciOrg1	BSciOrg2	BSciOrg3	BSciOrg4	BSciOrg5	BSciOrg6	BSciOrg7	BSciOrg8	BSciOrg9
PO1									
PO2	✓								✓
PO3			✓						✓
PO4				✓					
PO5	✓			✓	✓				
PO6		✓				✓		✓	
PO7	✓	✓							✓
PO8					✓	✓	✓		✓
PO9									
PO10									
PO11									

	BSciOrg10	BSciOrg11	BSciOrg12	BSciOrg13	BSciOrg14	BSciOrg15	BSciOrg16	BSciOrg17
PO1		✓						
PO2	✓	✓			✓			
PO3	✓	✓						
PO4		✓		✓				
PO5				✓	✓			
PO6			✓					✓
PO7	✓	✓				✓		✓
PO8		✓			✓	✓	✓	
PO9								
PO10								
PO11								

Subject Specific Intellectual Skills

	BSciEcol1	BSciEcol2	BSciEcol3	BSciEcol4	BSciEcol5	BSciEcol6	BSciEcol7	BSciEcol8	BSciEcol9
PO12									
PO13									
PO14									
PO15									
PO16									

	BSciEcol10	BSciEcol11	BSciEcol12	BSciEcol13	BSciEcol14	BSciEcol15	BSciEcol16	BSciEcol17	BSciEcol18
PO12	✓								
PO13									
PO14	✓								
PO15									
PO16	✓								

	BSciEcol19	BSciEcol20	BSciGen1	BSciGen2	BSciGen3	BSciGen4	BSciGen5	BSciGen6	BSciGen7
PO12			✓		✓				

PO13			✓		✓				
PO14							✓		
PO15			✓			✓			
PO16					✓				

	BSciGen8	BSciGen9	BSciGen10	BSciGen11	BSciGen12	BSciGen13	BSciGen14	BSciGen15	BSciGen16
PO12				✓					
PO13				✓					
PO14			✓	✓	✓				
PO15		✓		✓					
PO16				✓	✓				

	BSciGen18	BSciMolec1	BSciMolec2	BSciMolec3	BSciMolec4	BSciMolec5	BSciMolec6	BSciMolec7	BSciMolec8
PO12							✓		
PO13							✓		
PO14									
PO15									
PO16									

	BSciMolec9	BSciMolec1 0	BSciMolec1 1	BSciMolec1 2	BSciMolec1 3	BSciMolec1 4	BSciMolec1 5	BSciMolec1 6	BSciMolec1 7
PO12						✓	✓		
PO13						✓			
PO14									
PO15						✓			
PO16									

	BSciOrg1	BSciOrg2	BSciOrg3	BSciOrg4	BSciOrg5	BSciOrg6	BSciOrg7	BSciOrg8	BSciOrg9
PO12									
PO13									
PO14									
PO15									
PO16									

	BSciOrg10	BSciOrg11	BSciOrg12	BSciOrg13	BSciOrg14	BSciOrg15	BSciOrg16	BSciOrg17
PO12								
PO13								
PO14								
PO15							✓	
PO16								

Subject Specific Practical Skills

	BSciEcol1	BSciEcol2	BSciEcol3	BSciEcol4	BSciEcol5	BSciEcol6	BSciEcol7	BSciEcol8	BSciEcol9
PO17									
PO18									✓

	BSciEcol10	BSciEcol11	BSciEcol12	BSciEcol13	BSciEcol14	BSciEcol15	BSciEcol16	BSciEcol17	BSciEcol18
PO17									
PO18									

	BSciEcol19	BSciEcol20	BSciGen1	BSciGen2	BSciGen3	BSciGen4	BSciGen5	BSciGen6	BSciGen7
PO17									
PO18									✓

	BSciGen8	BSciGen9	BSciGen10	BSciGen11	BSciGen12	BSciGen13	BSciGen14	BSciGen15	BSciGen16
PO17			✓	✓					
PO18							✓	✓	

	BSciGen18	BSciMolec1	BSciMolec2	BSciMolec3	BSciMolec4	BSciMolec5	BSciMolec6	BSciMolec7	BSciMolec8
PO17									
PO18	✓								

	BSciMolec9	BSciMolec1	BSciMolec1	BSciMolec1	BSciMolec1	BSciMolec1	BSciMolec1	BSciMolec1	BSciMolec1

	0	1	2	3	4	5	6	7
PO17								
PO18								

	BSciOrg1	BSciOrg2	BSciOrg3	BSciOrg4	BSciOrg5	BSciOrg6	BSciOrg7	BSciOrg8	BSciOrg9
PO17									
PO18									

	BSciOrg10	BSciOrg11	BSciOrg12	BSciOrg13	BSciOrg14	BSciOrg15	BSciOrg16	BSciOrg17
PO17								
PO18								

Transferable Skills and Attributes

	BSciEcol1	BSciEcol2	BSciEcol3	BSciEcol4	BSciEcol5	BSciEcol6	BSciEcol7	BSciEcol8	BSciEcol9
PO19									
PO20									
PO21									✓
PO22									
PO23									
PO24									
PO25									

	BSciEcol10	BSciEcol11	BSciEcol12	BSciEcol13	BSciEcol14	BSciEcol15	BSciEcol16	BSciEcol17	BSciEcol18
PO19	✓								
PO20									
PO21									
PO22									
PO23	✓								
PO24									
PO25									

	BSciEcol19	BSciEcol20	BSciGen1	BSciGen2	BSciGen3	BSciGen4	BSciGen5	BSciGen6	BSciGen7
PO19						✓			
PO20									✓
PO21									
PO22			✓		✓				
PO23									
PO24									
PO25									

	BSciGen8	BSciGen9	BSciGen10	BSciGen11	BSciGen12	BSciGen13	BSciGen14	BSciGen15	BSciGen16
PO19								✓	
PO20							✓	✓	
PO21		✓							✓
PO22					✓				✓
PO23				✓				✓	
PO24		✓							
PO25									✓

	BSciGen18	BSciMolec1	BSciMolec2	BSciMolec3	BSciMolec4	BSciMolec5	BSciMolec6	BSciMolec7	BSciMolec8
PO19							✓		
PO20	✓								
PO21									
PO22									
PO23									
PO24									
PO25									

	BSciMolec9	BSciMolec1	BSciMolec1	BSciMolec1	BSciMolec1	BSciMolec1	BSciMolec1	BSciMolec1	BSciMolec1
		0	1	2	3	4	5	6	7
PO19									
PO20									
PO21									

PO22									
PO23									
PO24									
PO25									

	BSciOrg1	BSciOrg2	BSciOrg3	BSciOrg4	BSciOrg5	BSciOrg6	BSciOrg7	BSciOrg8	BSciOrg9
PO19									
PO20									
PO21									
PO22									
PO23									
PO24									
PO25									

	BSciOrg10	BSciOrg11	BSciOrg12	BSciOrg13	BSciOrg14	BSciOrg15	BSciOrg16	BSciOrg17
PO19								
PO20								
PO21								
PO22								
PO23								
PO24								
PO25								

Appendix IV: Benchmark Benchmark Statement(s)

BSciEcol1 - *Demonstrate knowledge of biogeochemical cycles and pathways*

BSciEcol2 - *Describe and exemplify nutrient and energy flow through individuals, populations and communities*

BSciEcol3 - *Describe the structure, biogeography and diversity of ecosystems in relation to climate, geology, soils, palaeo-historical, taxonomic and evolutionary factors*

BSciEcol4 - *Describe and exemplify patterns of distribution of organisms in relation to biotic and abiotic factors*

BSciEcol5 - *Demonstrate knowledge of population genetics, dynamics and interactions, and associated theoretical models*

BSciEcol6 - *Demonstrate knowledge of community structure, development, biodiversity, and associated theoretical models*

BSciEcol7 - *Show awareness of human interactions with natural populations and ecosystems, including habitat modification, pollution, exploitation and conservation*

BSciEcol8 - *Show awareness of the applied significance of species as resources and as damage-causing organisms*

BSciEcol9 - *Carry out routine investigations as instructed, using appropriate ecological and/or molecular methodologies and data analyses*

BSciEcol10 - *Exhibit practical fieldwork skills including but not limited to ecological survey techniques, taxonomic identification of organisms and ecological impact assessments*

BSciEcol11 - *Demonstrate comprehension and intelligent engagement with biogeochemical cycles and pathways*

BSciEcol12 - *Discuss and demonstrate comprehension of nutrient and energy flow through individuals, populations and communities*

BSciEcol13 - *Understand the structure, biogeography and diversity of ecosystems in relation to climate, geology, soils, palaeo-historical, taxonomic and evolutionary factors*

BSciEcol14 - *Discuss and critically analyse patterns of distribution of organisms in relation to biotic and abiotic factors*

BSciEcol15 - *Demonstrate comprehension and critical analysis of population processes, dynamics and interactions, and associated models*

BSciEcol16 - *Demonstrate comprehension and critical analysis of community structure, development, biodiversity, and associated models*

BSciEcol17 - *Critically analyse and evaluate the effects of such human interactions on natural populations and ecosystems*

BSciEcol18 - *Evaluate the impacts of harvesting resources, controlling pest/pathogens and different approaches to species management*

BSciEcol19 - *Apply critical understanding of ecological methodologies and data analyses*

BSciEcol20 - *Demonstrate an appreciation of the multidisciplinary approach required to address ecological and environmental issues*

BSciGen1 - *Experience and competence in a broad range of appropriate practical techniques and skills relevant to the biosciences including data collection, analysis and interpretation of those data, and testing of hypotheses and the ability to place the work...*

BSciGen2 - *The ability to explain biological phenomena at a variety of levels (from molecular to ecological systems) and how evolutionary theory is relevant to their area of study*

BSciGen3 - *The ability to plan, execute and present a piece of hypothesis-driven work within a supported framework in which qualities such as time management, problem solving, and independence are evident*

BSciGen4 - *The ability to access and evaluate bioscience information from a variety of sources and to communicate the principles both orally and in writing in a way that is organised and topical, and recognises the limits of current hypotheses*

BSciGen5 - *An appreciation of ethical issues and how they underpin professional integrity and standards*

BSciGen6 - *An appreciation of the impact on society of advances in the biosciences*

BSciGen7 - *The ability to record data accurately, and to carry out basic manipulation of data (including qualitative data and statistical analysis, when appropriate)*

BSciGen8 - *An understanding of the use of bioinformatics approaches in the analysis of large datasets*

BSciGen9 - *Strategies that enable them to update their knowledge of the biosciences*

BSciGen10 - *An awareness of professional standards, including Good Laboratory Practice¹² for data collection, recording and interpretation*

BSciGen11 - *Plan, execute and present an independent piece of work, in which qualities such as time management, problem solving and independence are evident, as well as interpretation and critical awareness of the quality of evidence*

BSciGen12 - *Construct reasoned arguments to support their position on the ethical and social impact of advances in the biosciences*

BSciGen13 - *Demonstrate a secure and accurate understanding of the explanation of biological phenomena at a variety of levels (from molecular to ecological systems) and explain the relationship of evolutionary theory to their area of study*

BSciGen14 - *Apply relevant advanced numerical skills to biological data*

BSciGen15 - *Communicate science to peers and non-scientists*

BSciGen16 - *Demonstrate well developed strategies for updating, maintaining and enhancing their knowledge of the biosciences, including cross-disciplinary awareness*

BSciGen18 - *Access bioscience databases and use appropriate selection criteria to mine, manipulate and interpret data*

BSciMolec1 - *Know and explain the structure and function of various types of cells in unicellular and multicellular organisms, the structure and function of cell membranes,*

BSciMolec2 - *Express relevant biological reactions in chemical terms*

BSciMolec3 - *Explain the chemistry and structure of the major biological macromolecules and how that determines their biological properties*

BSciMolec4 - *Explain how the principles of genetics underlie much of the basis of molecular biology*

BSciMolec5 - *Explain the principles of gene expression and how it is controlled*

BSciMolec6 - *Explain a range of appropriate and relevant experimental techniques and how they are used; and be able to perform some of them*

BSciMolec7 - *Describe cell metabolism, including the main anabolic and catabolic pathways*

BSciMolec8 - *Describe protein structures and functions and their control mechanisms*

BSciMolec9 - *Understand the chemistry that underlies biochemical reactions and the techniques used to investigate them*

BSciMolec10 - *Explain the principles that determine the three-dimensional structure of biological macromolecules and give detailed examples of how structure enables function*

BSciMolec11 - *Demonstrate a critical understanding of the molecular basis of genetics and explain some detailed examples*

BSciMolec12 - *Demonstrate critical knowledge and understanding of gene expression, with a detailed knowledge of specific examples; the structure, arrangement, expression, and regulation of genes; and relevant experimental methods*

BSciMolec13 - *Demonstrate knowledge of a wide range of cells (both prokaryotic and eukaryotic) and explain critically how their properties suit them for their biological function, and how they could be investigated experimentally*

BSciMolec14 - *Devise and evaluate suitable experimental methods for the investigation of relevant areas of biochemistry and molecular biology*

BSciMolec15 - *Demonstrate a critical understanding of essential features of cell metabolism and its control, including topics such as energy and signal transduction, respiration and photosynthesis (including knowledge and experience of some experimental...*

BSciMolec16 - *Explain the chemical and thermodynamic principles underlying biological catalysis and the role of enzymes and other proteins in determining the function and fate of cells and organisms*

BSciMolec17 - *Mine, manipulate and interpret data from small molecule and/or macromolecular databases*

BSciOrg1 - *Describe the structure and diversity of the organisms studied, including their modes of reproduction, development and life history of the organisms*

BSciOrg2 - *Describe mechanisms for the life processes and appreciate how the physiology of an organism fits it for its environment*

BSciOrg3 - *Demonstrate an appreciation of the integration of metabolism*

BSciOrg4 - *Demonstrate knowledge of the basic genetic principles relating to, and evolution of, the organisms studied*

BSciOrg5 - *Describe how organisms are classified and identified*

BSciOrg6 - *Explain the interactions of organisms with each other and the environment*

BSciOrg7 - *Describe the place of the organisms studied in the living world*

BSciOrg8 - *Demonstrate an appreciation of the importance of the 'behaviour' of the organisms studied*

BSciOrg9 - *Describe and analyse the impact of external influences on growth and reproduction, and explain reproductive strategies*

BSciOrg10 - *Demonstrate an understanding of the interactions of structure and metabolic function at cellular and organism level*

BSciOrg11 - *Describe and critically evaluate the evidence for the mechanisms of life processes*

BSciOrg12 - *Demonstrate an understanding of the significance of internal and external influences*

BSciOrg13 - *Describe and analyse patterns of inheritance and complex genetic interactions relating to the lives and evolution of the organisms studied*

BSciOrg14 - *Explain the methods and principles underlying taxonomy and classification*

BSciOrg15 - *Describe the principles and processes governing interactions of organisms and their environment*

BSciOrg16 - *Critically analyse the contribution of the organisms to the biosphere*

BSciOrg17 - *Critically assess the contribution of 'behavioural patterns' to survival and success*