

## ACADEMIC SERVICES

### PROGRAMME SPECIFICATION

Part 1: Basic Data		
<b>Awarding Institution</b>	University of the West of England, Bristol	
<b>Teaching Institution</b>	University of the West of England, Bristol	
<b>Delivery Location</b>	University of the West of England, Bristol. Frenchay Campus.	
<b>Faculty responsible for programme</b>	Faculty of Health and Applied Sciences	
<b>Department responsible for programme</b>	Department of Biological, Biomedical and Analytical Sciences	
<b>Modular Scheme Title</b>		
<b>Professional Statutory or Regulatory Body Links</b>	None	
<b>Highest Award Title</b>	BSc (Hons) Biological Sciences	
<b>Default Award Title</b>		
<b>Fall-back Award Title</b>		
<b>Interim Award Titles</b>	BSc Biological Sciences Certificate of Higher Education Biological Sciences Diploma of Higher Education Biological Sciences	
<b>UWE Progression Route</b>		
<b>Mode(s) of Delivery</b>	FT / SW / PT /	
<b>Codes</b>	<b>UCAS: C110</b>	<b>JACS:</b>
	<b>ISIS2:</b>	<b>HESA:</b>
<b>Relevant QAA Subject Benchmark Statements</b>	Biosciences (2007)	
<b>CAP Approval Date</b>	28/3/14 31/05/2017 (v2)	
<b>Valid from</b>	September 2014 September 2017 (v2)	
<b>Valid until Date</b>	September 2020	
<b>Version</b>	5	

### Part 2: Educational Aims of the Programme

The BSc (Hons) Biological Sciences programme is a three year full-time or four-year sandwich degree designed to deliver outstanding learning, advancing knowledge in the human, molecular and ecological areas of the biological sciences. It provides an opportunity for students to explore the theory and practice related to the biological sciences, and to develop both subject-specific and important generic graduate skills, such as practical and analytical skills, work experience,

## Part 2: Educational Aims of the Programme

project management and use of technology and communication media. The BSc (Hons) Biological Sciences programme has been designed to deliver a broadly based core encompassing the processes and mechanisms of life from the molecular to ecosystem level in addition to developing in students, the understanding of and ability to engage with the scientific process. The programme has been designed around three principal themes; **ecology, human** and **molecular**, each constructed from a series of subject-relevant modules. The themes enable students the flexibility to develop their own subject-specific interests and have been structured to demonstrate clear routes through the degree programme. The combination of modules offered enables students to advance their knowledge and explore the breadth of the biological sciences while working at the cutting edge of the subjects using state-of-the-art equipment and learning support materials.

The programme has been designed to:

- Provide the educational and resource environment which will enable students with a background in biology to develop:
  - an understanding of the biological sciences from a multi-disciplinary and interdisciplinary perspective;
  - the field, laboratory, investigative, problem-solving, technical and communication skills necessary to undertake independent investigations and analyses, and the presentation skills necessary to communicate their findings to audiences with a variety of backgrounds;
  - the skills needed by a literate, numerate, technologically agile student capable of independent lifelong learning;
  - the ability to learn through practice and apply subject-specific and generic skills in the context of the sustainable global society and to realise their potential as ready and able graduates.

The specific aims of the programme are to enable students to:

- Develop an appreciation of the complexity and diversity of life processes through the study of organisms, their molecular, cellular and physiological processes, their genetics and evolution, and the interrelationships between them and their environment.
- Advance knowledge within the field of the biological sciences with respect to its impact on humans and to human health and wellbeing and make a positive contribution to society and to their chosen field of employment through application and communication of the biological sciences.
- Use and interpret literature appropriate to the biological sciences with a full and critical understanding, while addressing such questions as content, context, aims, objectives, quality of information, and its interpretation and application.
- Create a friendly, supportive and contemporary atmosphere that will enable individual students to use the whole learning experience at UWE to create a graduate foundation, on which they can develop their future careers and on-going social and educational development as independent lifelong learners.
- Provide a curriculum that is enhanced by the strong relationship between teaching, research, and professional practice and informed by employers.

**Programme requirements for the purposes of the Higher Education Achievement Record (HEAR)**

## Part 2: Educational Aims of the Programme

The BSc (Hons) Biological Sciences programme has been designed to deliver a broadly based core encompassing the processes and mechanisms of life. The programme aims to develop in students an understanding of the complexity and diversity of life through study of the molecular, cellular and physiological processes of organisms, how organisms interrelate and relate to the environment in addition to an understanding of the hypothesis-driven scientific process. The programme offers a placement year, and provides opportunities for students to develop generic skills necessary for employment, such as practical and analytical skills, project management, use of technology and communication media.

## Part 3: Learning Outcomes of the Programme

The award route provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas:

### A. Knowledge and Understanding (subject specific)

A successful graduate will be able to:

1. Demonstrate an understanding of the explanation of biological phenomena at a variety of levels from molecular to ecological systems.
2. Plan, execute and present an independent piece of hypothesis-driven work within a supported framework in which qualities such as time management, problem solving, and independence are evident.
3. Demonstrate an understanding of the relationship between plants, animals and micro-organisms, and how they interact with their environment.
4. Demonstrate knowledge of the terminology, nomenclature and classification systems utilised within the biological sciences.
5. Understand how the chemistry and structure of biological molecules determines their biological properties.
6. Demonstrate knowledge of the structure and function of cells including cellular metabolic processes.
7. Understand how genetics and gene expression underpin the modern biological sciences.
8. Utilise methods of acquiring, interpreting and analysing information and data with a critical understanding of the appropriate contexts for their use.
9. Demonstrate knowledge of biogeochemical cycles, describing nutrient flow through individuals, populations and communities.
10. Describe the structure and diversity of ecosystems and understand the impact of human activity on the natural environment.
11. Understand the importance of a rigorous research process and the impact of research in the biological sciences on society.

### B. Intellectual Skills (generic)

A successful graduate will be able to:

1. Recognise and apply subject-specific theories, paradigms, concepts or principles.
2. Seek and analyse, synthesise and summarise information critically, including published research or reports.
3. Obtain and integrate several lines of subject-specific evidence to formulate and test hypotheses.
4. Apply subject knowledge and understanding to address familiar and unfamiliar problems.
5. Synthesising knowledge as an independent learner and a manager of self.

### Part 3: Learning Outcomes of the Programme

6. Recognise the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct.

#### C. Subject/Professional/Practical Skills (subject specific)

A successful graduate will be able to:

1. Appreciate the complexity and diversity of life processes through the study of organisms, their molecular, cellular and physiological processes, their genetics and evolution, and the interrelationships between them and their environment.
2. Undertake sufficient practical work to ensure competence in the basic experimental skills.
3. Design, plan, conduct and report on investigations, and evaluate information which may involve primary or secondary data obtained through individual work or group projects.
4. Obtain, record, collate and analyse data using appropriate techniques in the field and/or laboratory, working individually or in a group.
5. Undertake field and/or laboratory investigations of living systems in a responsible, safe and ethical manner.
6. Read and use appropriate literature with a full and critical understanding, addressing content, context, aims, objectives, quality, interpretation and application.

#### D. Transferable Skills and other attributes (generic)

A successful graduate will be able to:

1. Receive and respond to a variety of sources of information (eg. textual, numerical, verbal, graphical and electronic).
2. Communicate appropriately to a variety of audiences using a range of formats, approaches and contemporary technologies.
3. Appreciate issues of sample selection, accuracy, calibration, precision, replicability and uncertainty during collection, recording and analysis of data in the field and laboratory.
4. Prepare, process, interpret and present data, using appropriate qualitative and quantitative techniques and packages.
5. Solve numerical problems using computer and non-computer based techniques.
6. Use the internet and other electronic sources critically as a means of communication and a source of information.
7. Recognise and respect the views and opinions of others.
8. Evaluate performance as an individual and a team member.
9. Develop the skills necessary for a self-managed active learner and life-long learning (eg working independently, time management and organisation skills).
10. Appreciate the skills for employment, respond to feedback and work towards targets for personal, academic and career development.

The Learning outcomes of the programme are mapped to the **compulsory modules** as shown below. This is to demonstrate that all students are able achieve all programme outcomes although many outcomes will be re-enforced through **optional modules**.

## Part 3: Learning Outcomes of the Programme

<b>Learning Outcomes:</b>	USSK5C-30-1 Life on Earth	USSKA3-30-1 Anatomy and Physiology	USSKA4-30-1 Cell Biochemistry and Genetics	USSKA6-30-1 Skills for Biosciences	USSKAP-30-2 Research Skills	USSK5K-30-3 Research Experimental Project USSKBC-30-3 Research Dissertation Project	USSKCF-15-3 Scientific Frontiers and Enterprise
<b>A) Knowledge and understanding of:</b>							
Biological phenomena from molecular to ecosystem level	X	X	X				X
Relationship between organisms and environment	X	X	X				
Terminology, nomenclature and classification	X	X	X	X	X	XX	X
Chemistry and structure of biological molecules	X	X	X		X		
Structure and function of cells	X	X	X		X		
Genetics and gene expression	X	X	X		X		
Acquire, interpret and analyse information in context.	X	X	X	X	X	XX	X
Biogeochemical cycles and nutrient flow	X						
Ecosystems and human impact	X						
Ability to plan, execute and present independent piece of research				X	X	XX	X
Impact of research					X		X
<b>(B) Intellectual Skills</b>							
Using theories and paradigms	X	X	X			XX	
Analyse, synthesise, summarise information	X	X	X	X	X	XX	X
Obtain evidence, test hypotheses				X	X	XX	
Apply knowledge to problems	X	X	X	X	X	XX	X
Independent learner, self-manager				X	X	XX	
Appreciate moral, ethical issues around investigation					X	XX	X
<b>(C) Subject/Professional/Practical Skills</b>							
Appreciate knowledge and complexity of life processes	X	X	X			XX	
Practical competence	X	X	X	X	X	X	
Design, plan, conduct and report on investigations				X	X	XX	
Collect, analyse and present data	X	X	X	X	X	XX	
Safe and ethical investigations of living systems	X	X	X	X	X	XX	

Part 3: Learning Outcomes of the Programme							
Read and critically appraise literature					X	XX	X
<b>(D) Transferable skills and other attributes</b>							
Use a variety of sources of information	X	X	X	X	X	XX	X
Communicate appropriately using contemporary technologies				X	X	XX	X
Appreciate issues of accuracy uncertainty	X	X	X	X	X	XX	
Prepare, process, interpret data	X	X	X	X	X	XX	
Solve numerical problems	X	X	X	X	X		
Use internet appropriately for transfer of information	X	X	X	X	X	XX	X
Respect views of others	X			X	X		X
Evaluate individual performance				X		XX	
Active & independent learning	X	X	X	X	X	XX	X
Skills for employment				X	X	XX	X

Part 4: Student Learning and Student Support
<p><b>Transition to HE and student support</b></p> <p>BSc Hons Biological Sciences is managed as part of a suite of programmes within the Biological and Environmental Sciences &amp; Science Communication Subject Group. Programme handbooks provide information on the Faculty, the University, its regulations and procedures. Detailed information is distributed in guides for each module. At the start of the programme, students undertake a comprehensive induction programme and are introduced to university regulation, aims of the programme, laboratory working, support systems (e.g. Drop-ins, PAL) and their Academic Personal Tutor (APT). Students are allocated an Academic Personal Tutor and become part of a tutor group (typically &lt; 15 tutees). APT sessions for the BSc (Hons) Biological Sciences programme include a provision of at least 90 minutes of contact with the APT tutor in the first year then twice for 30 minutes each in the second and third years, with the student able to book meetings upon request. In addition, timetabled APT sessions are included in the Level 1 and 2 skills modules. Students are further supported during their time at UWE by student advisors and module leaders. Guidance on year issues is overseen by the Programme Manager, who is supported by the Teaching Team and AHoD. Issues relating to groups of students are dealt with through the Student Rep / Staff Forum (SRSF) that includes student representatives, who also meet with the Programme Manager on a regular basis. Students who elect to undertake a placement year, are allocated a placement tutor who will maintain contact, plan a visit where possible and provide support and liaise with work supervisors. For all students, access to academic staff and the student advisors is via e-mail or by personal access, with most staff offering an office-hours policy facilitating the booking of appointments. The programme welcomes mature students and students with disabilities. When possible, and following individual consultation, adjustments are made to practical and field work to allow all students to achieve the learning outcomes of the programme. The central University counselling and support services provide assistance and guidance for students with disabilities and issues guidance to Module Leaders via Programme Managers in making provision for students' reasonable adjustments.</p> <p><b>Teaching and Learning facilities</b></p> <p>The Faculty has a well-equipped range of state-of-the-art general and specialist laboratories, a dedicated field laboratory, large glasshouse used for teaching and project work, a dedicated project laboratory and a wide range of specialist scientific equipment that is available for use by the</p>

## **Part 4: Student Learning and Student Support**

students at appropriate stages in their study programme. This provision supports experiential learning and the development of ready and able graduates, equipped to enter the employment market with outstanding practical skills in the biological sciences. The Bolland library provides an extensive range of literature that supports the programme. Additional material is held in the Field Studies Resource Room. Students have 24-hour access to computers, and IT support services are available within the University's Computing Helpdesk. Learning Zones are available throughout the University, providing IT equipment to support both individual and group learning. The University's Virtual Learning Environment, hosted by Blackboard has been developed to enhance the student's learning experience and provide comprehensive support on a module-by-module basis. Support includes, access to teaching materials, links to relevant online resources and background reading, facilities for interaction and coordination during group work (e.g. blogs, wikis) and communication between tutors and students.

### **Preparation for the world of work**

An aim of this programme is to produce ready and able graduates that are able to make a positive contribution to society and to their chosen field of employment. To support this objective and to develop employability skills, as part of the core Biological Sciences programme at Level 1, students undertake the Skills for Biosciences module which enhances subject-based and generic key skills and emphasises student understanding of the need to develop transferrable graduate skills in addition to subject-specific learning. This is reinforced by the Level 2 Research Skills module, designed to develop students' scientific skills in preparation for both the placement year and the Level 3 Research Project module. Students are encouraged to take the Placement Year to build up their work experience skills and this occurs between Level 2 and Final Year. Scientific and generic careers events are organised throughout the year for students at all levels and career advice and C.V. preparation is a key aspect of the APT programme. Enterprise and entrepreneurship are key topics delivered in the compulsory Final Year module Scientific Frontiers and Enterprise.

Laboratory and field work are of fundamental importance to the development of employability skills and understanding in the biological sciences, and occur across a range of modules at all levels. Subject specific and generic laboratory skills are learned at all levels; field-based practicals are compulsory at Levels 1 and 2 and residential field trips are optional at Level 3. The costs associated with compulsory field trips are generally met by the Faculty, however, optional trips may incur an additional cost. At Final Year students undertake an independent research project. This is supported by compulsory modules at Levels 1 and 2 during which students develop the skills to project plan, self manage, collect data, analyse and interpret data and write scientific reports.

BSc (Hons) Biological Sciences students also have the option to enrol on the UWE Bristol Futures Award. This employability award is open to all full-time and sandwich undergraduate students at UWE and recognises the variety of activities that that students can engage in during their time at university. This includes opportunities to develop their practical experience, leadership skills, enterprise skills and global and cultural awareness. Completing a selection of these enables students to achieve the UWE Bristol Futures Award, enhancing their C.V. and their employability skills.

### **Placement Learning**

The Biological Sciences sandwich placement year is considered an integral part of the programme, with the expectation that students will undertake a placement in an industrial or academic organisation in a research and development environment. Students may opt to take the Professional Practice Module whilst on placement, and successful completion of 40 weeks of appropriate employment in biosciences qualifies the student for a Sandwich Award on graduation. The Faculty has a Placements Support Team, comprising the Faculty Placements Tutor, specific BMS training (if a biomedical placement is chosen) and Environmental tutors, and the Placements

## Part 4: Student Learning and Student Support

co-ordinator to provide administrative support. The Biological Sciences programme has 30 years experience in arranging placements for up to 100 students per annum; placements include major pharmaceutical companies around the world, within North American universities and also European organisations. In many instances, students are successful in obtaining placements through competitive interview, often with students from other Universities. Further research/development style placements are currently being sought in the pharmaceutical and nutraceutical industries. Placement learning contributes to the Level 3 module Professional Practice in Applied Sciences.

### Teaching and Learning, Technology Enhanced Learning (TEL)

In order to support students during their transition to HE and to help students become independent learners, taught sessions at Level One are a mixture of interactive lectures, tutorials, workshops, laboratory, field and computer practicals. During this year students are taught the skills necessary to engage with appropriate technologies to allow a gradual move towards facilitated learning at Level 2 and Final Year. The taught sessions at UWE utilise TEL to support a pedagogy of Inductive Learning where the students engage in facilitated activities such as debates, problem based learning, group working, and research. Integral to this programme is the use of subject based as well as generic use of technologies. For instance, data analysis and modelling, mapping (GIS), communication for conservation, are subject areas reliant on a range of contemporary technologies. Furthermore, research equipment used for the acquisition and manipulation of data is becoming increasingly integrated with IT infrastructure. In addition modern technologies are incorporated as vehicles of learning (e.g. blogs, web pages, data bases) and as vehicles for learning through assessment (e.g. online portfolios, online tests, wikis, press releases and poster presentations) Below is a map showing the use of TEL in subject knowledge, subject delivery and subject assessment.

		TEL as subject knowledge	TEL as a Vehicle for subject delivery	TEL as vehicle for subject assessment and learning
<b>Compulsory Modules Level 1</b>	<b>USSK5C-30-1</b> Life on Earth	Data analysis	Bb, Online resources,	Data analysis & data presentation
	<b>USSKA3-30-1</b> Anatomy and Physiology	Data analysis, data acquisition	Bb, Online resources	Data analysis & data presentation, formative quizzes
	<b>USSKA4-30-1</b> Cell Biochemistry and Genetics	Data analysis,	Bb, Online resources	Data analysis & data presentation
	<b>USSKA6-30-1</b> Skills for Biosciences	Data analysis, research, GPS	Bb, Online resources, computer tutorials, ECDL	Online portfolio with ECDL cert. Data analysis & data presentation
<b>Compulsory Modules Level 2</b>	<b>USSKAP-30-2</b> Research Skills	Data analysis, research, dissemination technologies	Bb, Online resources, computer practicals	Data analysis/interpretation
<b>Optional Modules Level 2</b>	<b>USSKAQ-30-2</b> Microbial Life	Data analysis, data acquisition	Bb, Online resources	Data analysis & data presentation (laboratory report)
	<b>USSKAL-30-2</b> Molecular Biology	Data analysis, data acquisition, seek retrieve and interpret material	Bb, Online resources	Data analysis & data presentation (practical portfolio)



## Part 4: Student Learning and Student Support

	<b>USSKAM-30-2</b> Genes & Biotechnology	Data analysis, data acquisition	Bb, Online resources	Data analysis & data presentation (extended practical report)
	<b>USSKAN-30-2</b> Human Health & Disease	Data analysis, data acquisition	Bb, Online resources, computer practicals	Data analysis & data presentation (laboratory report)
	<b>USSKAS-30-2</b> Physiological and Immunological Systems	Data analysis, data acquisition	Bb, Online resources (links website constructed)	No coursework listed in mod spec
	<b>USSK5F-30-2</b> Ecology & Ecosystem Protection	Data analysis	Bb, Online resources	Data analysis & data presentation Online portfolio
	<b>USSK5H-30-2</b> Wildlife Ecology	Data analysis, i.d. keys	Bb, online resources, audio recordings, decision tools (U choose)	Data analysis & data presentation OLA Oral feedback
<b>Compulsory Modules Level 3</b>	<b>USSK5K-30-3</b> Research Experimental Project <b>OR</b> <b>USSKBC-30-3</b> Research Dissertation Project	Data analysis	Bb, Online resources	Gantt chart, Data analysis, Poster presentation
	<b>USSKCF-15-3</b> Scientific Frontiers and Enterprise	Data analysis	Bb, Online resources	Oral presentation
<b>Optional Modules Level 3</b>	<b>USSKCG-15-3</b> Applied Biotechnology	Data analysis	Bb, Online resources, TEL-enhanced tutorial sessions	Data analysis & data presentation, formative quizzes
	<b>USSKCE-15-3</b> Science Communication	Communication skills, poster and oral presentation	Bb, Online resources (Box of Broadcasts)	Workshop portfolio
	<b>USSKBH-30-3</b> Medical Genetics	Data analysis, presentation skills	Bb, Online resources, upload of presentation material	Data analysis & data presentation (researched essay and ethical debate)
	<b>USSKBF-30-3</b> Genomic Technologies	Data analysis, bioinformatics tools	Bb, Online resources, bioinformatics tutorials	Data analysis & data presentation (bioinformatics)
	<b>USSKBG-30-3</b> Gene Control	Data analysis, bioinformatics tools	Bb, Online resources, bioinformatics tutorials	Data analysis & data presentation
	<b>USSKBJ-30-3</b> Medical Microbiology	Use of appropriate online resources	Bb, Online resources	Literature search and collection
	<b>USSKCA-15-3</b> Neuropharmacology		Bb, Online resources	Formative quizzes, literature search
	<b>USSKBV-15-3</b> Human Nutrition	Data handling	Bb, Online resources, simulation workshops	
	<b>USSKBW-15-3</b> Pathophysiology		Bb, Online resources	
	<b>USSK56-15-3</b> Primate Ecology & Conservation	Data analysis	Bb, Online resources	Data analysis & data presentation
	<b>USSKNB-15-3</b> Sustainable Food Production		Bb, Online resources	Data interpretation
	<b>USSKN6-15-3</b> Global Forest Systems	Data mining and analysis	Bb, Online resources, podcasts	Data mining and analysis

## Part 4: Student Learning and Student Support

	<b>USSKN9-15-3</b> Environmental Microbiology	Data collection	Bb, Online resources	Data collection and analysis
	<b>USSK55-15-3</b> Marine Ecosystems	Data analysis	Bb, Online resources	Data analysis & data presentation
	<b>USSKCD-15-3</b> Environmental Forensics	Data analysis and interpretation	Bb, Online resources	Data analysis & data presentation
	<b>USSK59-15-3</b> Tropical Expedition	Field technology Filming	Bb, Online resources	Data analysis & data presentation
	<b>USSK57-15-3</b> Professional Practice in Applied Science	Data analysis	Bb, Online resources	Presentation, Online portfolio, Learning agreement

### Description of any Distinctive Features

The BSc. (Hons) Biological Sciences programme has the following key features:

- A broadly based core at Level 1 designed to introduce the range of Biological Sciences and to provide students with the requisite knowledge and scientific skills to develop as biological scientists.
- A flexible modular structure through Levels 2 and 3 to allow Biological Sciences students to explore their individual interests.
- A modular structure clustered into clearly identified **themes** (human, molecular, ecology) at Levels 2 and 3. Identifying these themes amongst the rich diversity of biological sciences subjects affords students a clear path from entry on to the course through to students' chosen area of employment.
- A strong practical provision providing subject specific learning and generic scientific skills to enhance employability through experiential learning (learning by doing).
- Decided scientific and research skills modules at Levels 1 and 2 designed to empower students to develop into competent, questioning and independent scientists.
- An independent research project at Level 3 enabling students to apply the knowledge and skills learned at Levels 1 and 2 through their own independent research.

## Part 5: Assessment

A: Approved to [University Regulations and Procedures](#)

### Assessment Strategy

A range of assessment methods are employed to monitor student attainment of the full range of Learning Outcomes. Assessment incorporates the Department's assessment strategy and The QAA Code of Practice on Assessment of Students. The principles, procedures and processes of assessment for each module are described in the module booklet, which is provided to each student and available online at the start of the module. Further, these assessments are summarised in the Assessment Calendar provided via the UWE Portal, which also facilitates the appropriate scheduling of assessment loading. The Final Year optional modules (15 credit) have semester based delivery. This allows assessments to be spread across both semesters for even loading.

Effective learning is achieved by employing a range of assessment approaches, embedded within the compulsory modules and reinforced within the optional modules that recognise differential

## Part 5: Assessment

approaches to learning. These include opportunities for work-based learning, placements and field work. The development of a flexible, inclusive and accessible curriculum ensures a high quality learning experience for all students. The programme incorporates a range of innovative and novel assessments, many utilizing new technologies.

As shown above, Technology Enhanced Learning (TEL) is integral to the subject matter within this programme (see TEL map). Many taught topics are technology rich and TEL is also used to supplement learning and to help student learn through assessment. The mapping demonstrates a range of modern technologies across the programme, but also shows repetition, of technologies, thus re-enforcement of skills. This is particularly important between levels as it provides opportunities for students to become proficient with these media in key areas.

The Assessment Strategy has been designed to support and enhance the development of both subject-based and generic key skills and allow students to realise their true potential. The focus is on assessments that link directly to employability as well as assessments for learning. Assessments are designed to achieve the learning outcomes for each module and this is described on the module specification. The range and progression of assessment methods are shown below.

### Assessment Map

#### Assessment Map for BSc. (Hons) Biological Sciences

			Unseen Written Exam	Open Book Written Exam	In-class Written Test	Practical Exam/Skills Assessment	Oral assessment and/or presentation	Researched Report/Written Assignment	Data Analysis	Research Project Report	Laboratory /Field Report	Skills/Reflective Portfolio
Compulsory Modules Level 1	USSK5C-30-1	Life on Earth	A (40)					B (18)			B (42)	
	USSKA3-30-1	Anatomy and Physiology	A (40)			B (60)						
	USSKA4-30-1	Cell Biochemistry and Genetics	A (40)					B (30)	B (30)			
	USSKA6-30-1	Skills for Biosciences		A (40)				B (12)				B (48)
Compulsory Modules Level 2	USSKAP-30-2	Research Skills	A (50)					B (25)	B (25)			
Compulsory Modules Level 3	USSK5K-30-3	Research Experimental Project					A (20)	A (10)		A (70)		
	USSKBC-30-3	Research Dissertation Project										
	USSKCF-15-3	Scientific Frontiers and Enterprise					A (40)					B (60)
Optional Modules Level 2	USSKAQ-30-2	Microbial Life	A (50)					B (30)			B (20)	
	USSKAL-30-2	Molecular Biology	A (50)					B (25)			B (25)	

## Part 5: Assessment

	<b>USSKAM-30-2</b> Genes & Biotechnology	<b>A (50)</b>					<b>B (25)</b>			<b>B (25)</b>	
	<b>USSKAN-30-2</b> Human Health & Disease	<b>A (50)</b>					<b>B (30)</b>			<b>B (20)</b>	
	<b>USSKAS-30-2</b> Physiological and Immunological Systems No component B	<b>A (50)</b>									
	<b>USSK5F-30-2</b> Ecology & Ecosystem Protection	<b>A (50)</b>					<b>B (30)</b>				<b>B (20)</b>
	<b>USSK5H-30-2</b> Wildlife Ecology	<b>A (50)</b>			<b>B (25)</b>					<b>B (25)</b>	
<b>Optional Modules Level 3</b>	<b>USSKCG-15-3</b> Applied Biotechnology	<b>A (60)</b>					<b>B (40)</b>				
	<b>USSKCG-15-3</b> Science Communication						<b>A (50)</b>				<b>A (50)</b>
	<b>USSKBH-30-3</b> Medical Genetics	<b>A (60)</b>					<b>B (20) x 2</b>				
	<b>USSKBF-30-3</b> Genomic Technologies	<b>A (60)</b>					<b>B (25)</b>	<b>B (25)</b>			
	<b>USSKBG-30-3</b> Gene Control	<b>A (60)</b>					<b>B (25)</b>	<b>B (25)</b>			
	<b>USSX57-30-3</b> Medical Microbiology	<b>A (60)</b>			<b>B (10)</b>		<b>B (30)</b>				
	<b>USSKCA-15-3</b> Neuropharmacology	<b>A (60)</b>							<b>B (40)</b>		
	<b>USSKBV-15-3</b> Human Nutrition	<b>A (60)</b>					<b>B (40)</b>				
	<b>USSKBW-15-3</b> Pathophysiology	<b>A (60)</b>					<b>B (40)</b>				
	<b>USSK56-15-3</b> Primate Ecology & Conservation	<b>A (60)</b>									<b>B (40)</b>
	<b>USSKNB-15-3</b> Sustainable Food Production	<b>A (60)</b>							<b>B (40)</b>		
	<b>USSKN6-15-3</b> Global Forest Systems	<b>A (60)</b>					<b>B (40)</b>				
	<b>USSKN9-15-3</b> Environmental Microbiology	<b>A (60)</b>									<b>B (40)</b>
	<b>USSX45-15-3</b> Marine Ecosystems	<b>A (60)</b>									<b>B (40)</b>
	<b>USSKCD-15-3</b> Environmental Forensics	<b>A (60)</b>					<b>B (40)</b>				
	<b>USSK59-15-3</b> Tropical Expedition						<b>B (30)</b>				<b>B (70)</b>
<b>USSK57-15-3</b> Professional Practice in Applied Science											<b>A (10)</b>

\*Assessment should be shown in terms of either **Written Exams**, **Practical exams**, or **Coursework** as indicated by the colour coding above.

## Part 6: Programme Structure

This structure diagram demonstrates the student journey from Entry through to Graduation for a typical **full time student**. A diagram highlighting the programme **themes** is appended below.

ENTRY	Year 1	Compulsory Modules	Optional Modules	Interim Awards
		USSK5C-30-1 Life on Earth	None	Certificate of Higher Education: Biological Sciences
		USSKA3-30-1 Anatomy and Physiology		
		USSKA4-30-1 Cell Biochemistry and Genetics		
		USSKA6-30-1 Skills for Biosciences		
		Other requirements: 120 credits of which not less than 100 are at Level 1 or above.		

Year 2	Compulsory Modules	Optional Modules	Interim Awards
	USSKAP-30-2 Research Skills	USSKAQ-30-2 Microbial Life	Diploma of Higher Education: Biological Sciences
		USSKAL-30-2 Molecular Biology	
		USSKAM-30-2 Genes & Biotechnology	
		USSKAN-30-2 Human Health & Disease	
		USSKAS-30-2 Physiological and Immunological Systems	
		USSK5F-30-2 Ecology & Ecosystem Protection	
		USSK5H-30-2 Wildlife Ecology	
		Other requirements: 240 credits at which not less than 100 are at Level 2 or above and 120 are at Level 1 or above.	



**Year Out:** Students may elect to spend a year out working for an organisation, in an appropriate placement to gain relevant work experience. Credit is achieved through the **USSK57-15-3** Professional Practice in Applied Sciences module.

	Compulsory Modules	Optional Modules	Interim Awards
Year 3	USSK5K-30-3 Research Experimental Project <u>OR</u> USSKBC-30-3 Research Dissertation Project	USSKCG-15-3 Applied Biotechnology	BSc Biological Sciences  300 credits of which at least 60 must be at level 3, a further 100 at Level 2 or above and a further 140 at Level 1 or above
	USSKCF-15-3 Scientific Frontiers and Enterprise	USSKCE-15-3 Science Communication	
		USSKBH-30-3 Medical Genetics	
		USSKBF-30-3 Genomic Technologies	
		USSKBG-30-3 Gene Control	
		USSKBJ-30-3 Medical Microbiology	
		USSKCA-15-3 Neuropharmacology	
		USSKBV-15-3 Human Nutrition	
		USSKBW-15-3 Pathophysiology	
		USSK56-15-3 Primate Ecology & Conservation	
		USSKNB-15-3 Sustainable Food Production	
		USSKN6-15-3 Global Forest Systems	
		USSKN9-15-3 Environmental Microbiology	
		USSK55-15-3 Marine Ecosystems	
	USSKCD-15-3 Environmental Forensics		

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		USSK59-15-3 Tropical Expedition	
		USSK57-15-3 Professional Practice in Applied Science	

**GRADUATION**

## Part 7: Entry Requirements

The University's Standard Entry Requirements apply. The UCAS points tariff will be reviewed on a regular basis and published for new applicants. However, an applicant to this programme will typically have an A-level Grade C (or equivalent) in a science subject (Biology preferred) and one other science subject and have GCSEs in English Language, Maths and Double Science at grade C or above.

Non-standard applicants without appropriate A-levels, or an equivalent qualification, will be considered on a case-by-case basis.

## Part 8: Reference Points and Benchmarks

### The Framework for Higher Education Qualifications

The learning outcomes have been developed with reference to the qualification descriptors used in the QAA Framework for Higher Education Qualifications. In particular, the learning outcomes for the modules at Final Year are considered consistent with the QAA's descriptor for a higher education qualification at level 6: Bachelor's degree with honours. Graduates of the programme achieving an Honours classification will have developed a systematic understanding of key aspects of the biological sciences, some of it at the current boundaries of the academic discipline. In addition, graduates will have developed analytical techniques, problem-solving skills and communication skills that can be applied to a range of employment opportunities.

### Subject Benchmark Statements

The programme maps well to the QAA Biosciences benchmark statement (2007) and, in particular, to its subject specific and generic learning outcomes, as described in detail earlier in the Programme Specification. The BSc. (Hons) Biological Sciences degree provides a coherent yet flexible programme of study for students entering tertiary education with interests in the biological sciences who wish to develop their understanding and experience of applied biology to suit their own particular interests and requirements. The programme of study encourages a synergistic viewpoint with combinations of modules throughout the programme to produce a cross-disciplinary scientist with wide employment opportunities. The academic, and practical skills acquired during the programme enable the graduate to apply a problem-solving approach to scientific work. The programme also provides for the development of the important key, transferable skills such as mathematical, IT and communication skills that are essential in today's global market (Biosciences 3.4). Furthermore, the BSc (Hons) Biological Sciences is offered on an optional one-year sandwich basis to enhance graduate employability by providing additional experience, learning opportunities and the ability to contextualise and extend their existing subject-specific knowledge and generic skills. As such, the Biosciences programme enjoys a high reputation amongst employers because graduates from these programmes possess a comprehensive balance of subject-specific knowledge and practical skills as well as essential mathematical, IT, data analysis and communication skills. The aims of this programme are fully consistent with the 2020 vision of the University of the West of England to produce "*graduates ready and able to realise their full potential, make a positive contribution to society and their chosen field of employment or further study and play their full part in the development of a sustainable global society and knowledge economy*". Thus, the BSc (Hons) Biological Sciences degree, which is concerned with equipping students with both skills and subject-specific knowledge, promotes an educational opportunity that is fully consistent with the University's mission and strategy.



## Part 8: Reference Points and Benchmarks

Through the majority of the modules available to our biological sciences students, the BSc (Hons) Biological Sciences degree addresses much of the *“study of life at all levels of complexity”* (Biosciences 2.1) and recognises that *“complexity and the relationship between form and function are intrinsic”* (Biosciences 2.2) and includes *“studies at a variety of levels from molecules to populations”* (Biosciences 2.3). These aspects are addressed in core Level 1 modules including Life on Earth, Cell Biochemistry & Genetics and Anatomy and Physiology and reinforced through Levels 2 and 3.

From the second year, but particularly in the final year, increasing emphasis is placed on the recognition by the student that much of what is taught is *“contested and provisional, particularly in the light of continuing scientific advances”* (Biosciences 3.3) and that *“the biosciences exist in an environment of current hypotheses rather than certainty, where natural variation occurs and can confuse empirical data”* (Biosciences 2.4). There are a number of ways in which we provide the student with the intellectual and practical tools required to deal not only with the consequences of this paradigm within the complexity of cutting-edge biosciences but also those that stem from the pace of scientific advances in terms of *“continuing their self-education and development after graduation”* (Biosciences 2.5).

In the first, second and final years a strand of compulsory modules develops and reinforces the theoretical underpinnings as well as the laboratory practice of scientific investigation beyond that offered in the context of subject-specific modules; Skills in Biosciences is taught in the first year, and Research Skills in the second year. This culminates in the final year with an independent Research Project module in which a student works with a member of staff on an original piece of research. This strand addresses Biosciences 2.4 by helping students *“develop competence in comparing the merits of alternative hypotheses and receive guidance in terms of how to construct experiments or to make observations to challenge them”*, for the *“appreciation of hypothesis formation and testing”* (Biosciences 2.6), for *“competence in team and individual working and in numeracy (often including IT and statistics...), as well as proficiency in preparing reports in a written format for many different purposes”* (Biosciences 2.7) and *“knowledge of a range of practical and presentational techniques and methodologies relevant to the particular discipline, including data analysis and the use of statistics (where appropriate)”* (Biosciences 3.2).

The practise of bioscience occurs primarily in the laboratory, and the BSc. (Hons) Biological Sciences programme provides students with a solid training in the laboratory techniques that permits the contextualisation of existing knowledge in biological sciences and provide the means for its extension. In addition to the practical experience to be gained from the sandwich year, and given that the final year project is research-based, the students spend a significant proportion of their contact time within the teaching/research laboratories or engaging in field-work, therefore offering *“appropriate opportunities to participate in collecting data by undertaking experiments and practical investigations”* (Biosciences 2.6).

The teaching and learning strategies adopted by modules offered within the Biological Sciences degree cover the greater majority of those listed in Biosciences 4.2. With particular reference to lectures (Biosciences 4.3), many staff use *“computer-based or other audio-visual aids”* and place their material on the University’s VLE as a learning resource to consolidate learning. For laboratory work (Biosciences 4.4) students experience practicals *“carried out on material at a variety of levels from molecules to whole organisms”*. For *“personal experience of the approach, practice and evaluation of scientific research”* (Biosciences 4.6), both Research Skills at Level 2 and the Research Project module at Level 3 offer such opportunities, the assessment of which includes an oral examination component (Biosciences 4.8). For all modules, students are expected to spend a period of time equivalent to the timetabled sessions on *“set assignments and self-directed study, individually and within groups... [entailing] information seeking and the use of learning resources available in electronic or other format, reading, report writing and problem solving”* (Biosciences 4.7). Assessment strategies map well against Biosciences 4.9 and include unseen examinations, computer-based assessments, self and peer assessment, laboratory reports, essays, summaries and assignments, data interpretation exercises, case studies, poster, audio-visual/electronic presentations, a project report, and a work experience report.

## Part 8: Reference Points and Benchmarks

The compulsory and optional modules offered within Applied Biological Sciences provide the opportunity to meet a range of generic Bioscience benchmark standards, including:

- *Be able to access and evaluate bioscience information from a variety of sources and to communicate the principles both orally and in writing (e.g. essays, laboratory reports) in a way that is well-organised, topical and recognises the limits of current hypotheses;*
  - All first and second year modules (threshold) and all final year modules (typical).
- *Have ability in a broad range of appropriate practical skills and techniques relevant to the biosciences. This will include the ability to place the work in context and to suggest lines of further investigation.*
  - Level 2 Research Skills, Microbial Life, Molecular Biology, Genes & Biotechnology, Human Health and Disease, Physiological Systems and Immunology, Ecology and Ecosystem Protection and Wildlife Ecology and Level 3 Research Project.
- *Be able to plan, execute and present an independent piece of work (e.g. a project), in which qualities such as time management, problem solving and independence are evident, as well interpretation and critical awareness of the quality of evidence;*
  - Final year Research Project module.
- *Be able to apply relevant advanced numerical skills (including statistical analysis where appropriate) to biological data.*
  - Level 1 Skills for Biosciences, Level 2 Research Skills and Level 3 Research Project.
- *Have well-developed strategies for updating, maintaining and enhancing their knowledge of the biosciences.*
  - Implicit in all subject-specific modules and the Level 3 project. Key component of Level 3 Scientific Frontiers and Enterprise.

Staff in the Department of Biological, Biomedical and Analytical Sciences are research active and consequently, programme development, formal teaching and project work is underpinned and informed by current research, as outlined in the UWE 2020 strategy for “research that meets the needs of our community, a sustainable economy and society and feeds the scholarship and enquiry that underpins our learning and teaching.” Thus, all staff contributing to the Biological Sciences degree have an established record in supervising final year research-based projects. Furthermore, there is ongoing and developing research in the Bioscience, Biomedical Science, Human Biology, Forensic Science and Environmental Science which is encouraged and maintained by the Centre for Research in Biosciences (CRIB). There is active collaboration between bioscientists, physicists and chemists within the Faculty of Health and Applied Sciences, and also between these staff and those in other Faculties such the Faculty of Environment and Technology. These multidisciplinary groups reflect the developments described in Biosciences 2.3, and inform teaching within the Biosciences programme.

Overall, BSC. (Hons) Biological Sciences Honours graduates will have understanding of the key aspects of a range of biological sub-disciplines and will be able effectively to deploy established analytical techniques and enquiry in support of this. Furthermore, they will be able to devise and sustain arguments, solve problems, critically review aspects of current research, appreciate the uncertainty and limits of knowledge, and make use of reviews and primary sources. They will be able to apply their learning to consolidate, extend or apply their knowledge, develop new techniques and concepts, critically evaluate ideas and published material and communicate effectively to both specialist and non-specialist audiences. They will also have the qualities and

## Part 8: Reference Points and Benchmarks

transferable skills necessary for successful employment including the exercise of initiative and personal responsibility as well as the learning ability to undertake appropriate further professional training.

This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of individual modules can be found in module specifications, available on the [University's website](#).

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