

Programme Specification

Section 1: Basic Data

Awarding institution/body	University of the West of England
Teaching institution	University of the West of England
Department responsible for programme	Biological, Biomedical and Analytical Sciences
Programme accredited by	
Highest award title	BSc(Hons) Biological Sciences
Default award title	
Interim award title	Cert.HE Biological Sciences Dip.HE Biological Sciences
Modular Scheme title (if different)	
UCAS code (or other coding system if relevant)	C110
Relevant QAA subject benchmarking group(s)	Biosciences
On-going/valid until* (*delete as appropriate/insert end date)	
Valid from (insert date if appropriate)	
Authorised by...	Date:...
Version 3.2	

Section 2: Educational aims of the programme

The BSc (Hons) Biological Sciences degree is designed for those interested in taking a hands-on approach to studying from a broader or more individual selection of biological subjects and sub-disciplines than those offered within our named Bioscience degrees. Our emphasis is on the applied aspects of Biological Sciences and provision of a relevant education that affords employment opportunities.

The programme provides:

- opportunities for students from a wide range of backgrounds to develop and realise their potential in a supportive and responsive teaching and learning environment
- appropriate curriculum content providing added value for learners in their subject-specific knowledge and the acquisition of transferable skills
- a coherent and flexible programme of study with a variety of attendance modes within the University modular scheme
- understanding of the context of Biological Sciences and its application to practical problems
- a programme responsive to feedback from students, external examiners and other stakeholders as part of quality programme management and enhancement
- appropriate facilities and resources to deliver a quality teaching and learning experience

The programme is concerned with the integration of a wide range of subjects to the understanding of Biological Sciences. The combination of modules offered enables students flexibly to explore the breadth of Biological Sciences while working at the cutting edge of the subjects using state-of-the-art equipment and learning support material.

Section 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

Learning outcomes

Teaching, Learning and Assessment Strategies

A Knowledge and understanding of:

1. demonstrate a broad knowledge base with specific areas of deeper understanding relevant to modern Biological Sciences
2. understand the context of applied Biological Sciences and its application to practical problems
3. demonstrate an understanding of the contribution of research and scholarship in within applied Biological Sciences

Teaching/learning methods and strategies:

Acquisition of knowledge is achieved through a variety of methods including lectures, practicals, seminars, tutorials, case studies and project work. Additional support is provided through E-learning including Blackboard. Throughout, the learner is encouraged to undertake independent reading both to supplement and consolidate what is being taught/learned and to broaden their individual knowledge and understanding of the subject.

Assessment:

Testing of the knowledge base is through assessed coursework and through tasks undertaken under examination conditions. Methods are specified in each module guide and are varied and designed to test the learning outcomes.

B Intellectual Skills

<p>B Intellectual Skills</p> <p>The ability to...</p> <ol style="list-style-type: none"> 1. Actively question and seek information 2. Compare and contrast information from different sources 3. Critically evaluate information against hypotheses in a range of research scenarios 4. Actively analyse and apply problem-solving strategies 5. Demonstrate independent and self-directed learning 	<p>Teaching/learning methods and strategies</p> <p>Intellectual skills are developed through student-centred learning, written assignments, practical work, data handling and interpretation, tutorial and seminar work. The research project is designed to permit students to demonstrate achievement of all the learning outcomes 1-5.</p> <p>Assessment</p> <p>A variety of assessment methods are employed. Some/all test a learner's ability to demonstrate skills 1-5 through examinations but assessment of coursework and practical project work including student oral presentation is the main vehicle for assessment of higher order skills.</p>
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C Subject, Professional and Practical Skills

<p>C Subject/Professional/Practical Skills</p> <p>The ability to...</p> <ol style="list-style-type: none"> 1. Critically observe, analyses and evaluate information arising from a wide range of sources 2. Apply practical approaches to the study of selective aspects of Biological Sciences and demonstrate an awareness of safety and good laboratory practice. 3. Communicate effectively scientific data and concepts 4. Develop discipline-specific interests by specialising within the programme in relation to subject and/or career aspiration 5. Demonstrate an understanding of the research process through the execution of a research project 	<p>Teaching/learning methods and strategies</p> <p>Skills 1-4 are acquired and developed in a coordinated and progressive throughout the levels of the programme through lectures, tutorials, case studies, practical and project work. At level 1 attention is focussed on the acquisition of basic skills and safe working practices through prescribed exercises, while at level 2 more advanced techniques and open ended practical work are introduced. At level 3 the research project is pivotal to the acquisition and consolidation of skills 1-5.</p> <p>Assessment</p> <p>Skills 1, 2, 3 and 4 are primarily assessed through practical reports, coursework and research projects – proposal, oral presentation and report. Additionally, skill 5 is assessed in the research project.</p>
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D Transferable Skills and other attributes

<p>Transferable skills and other attributes</p> <p>The ability to...</p> <ol style="list-style-type: none"> 1. Communicate effectively and appropriately using a variety of methods 2. Critically analyse data arising from various means of biological inquiry 3. Undertake active learning and development 4. Apply information management skills 5. Practice effective time management 6. Evaluate performance of self and others 	<p>Teaching/learning methods and strategies</p> <p>Skills are developed throughout all the compulsory and core modules and in particular the spine of experimental design, data analysis and research project modules. The skills are further developed throughout the programme via case studies, practicals, tutorials and coursework assignments.</p> <p>Assessment</p> <p>A range of assessment strategies are utilised including essay, practical report, group work, case study, oral presentation, literature review and critique as well as the research project</p>
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Section 4: Programme structure	FULL TIME SANDWICH
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BSc (Hons) Biological Sciences C110**Programme Structure²****BSc (Hons) BIOLOGICAL SCIENCES: STRUCTURE DIAGRAM****Year 1 (all compulsory)**Interim award: **Certificate of Higher Education** 120 credits

The Living World USSJNS-40-1	Human Anatomy & Physiology USSJL-20-1	Cell Biology and Biochemistry USSJIM-20-1	Genetics & Evolution USSJIN-20-1	Scientific & Analytical Skills USSJR6-20-1
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Year 2 (shaded modules are compulsory; choose 5 optional modules)Interim award: **Diploma of Higher Education** 240 credits

Experimental Design & Analysis USSJ4D-20-2	Human Physiology USSJ4F-20-2	Molecular Aspects of Life USSJNB-20-2	Biology of Micro- organisms USSJ4G-20-2	Immunology & Disease USSJ4E-20-2
Plant Growth and Survival USSJ9Y-20-2	Human Biochemistry & Nutrition USSJKS-20-2	Animals & Ecosystems USSJ9X-20-2	Applied Ecology USSJ9R-20-2	Applied Genetics USSJ4Y-20-2
Drugs & Disease USSJ4V-20-2	Molecular Genetics USSJ4C-20-2	1 approved module from the AS scheme		

Placement Year

Students may opt to undertake a placement in an industrial or academic organisation in a research and development environment. The Placement Year contributes to the student's final year credit through the Professional Practice in Applied Science module.

Year 3 (shaded modules are compulsory; choose 4 optional modules)**Degree with Honours 360 Credits**

Project USSJ73-40-3	Gene Expression & Cellular Regulation USSJJS-20-3	Applied Genomics USSJIV-20-3	Applied Pharmacology USSJIR-20-3	Molecular & Microbial Biotechnology USSJW-20-3
Cancer Biology & Genetics USSJJU-20-3	Pathophysiology of Brain & Body USSJQ-20-3	Clinical Biochemistry USSJE-20-3	Medical Microbiology USSJN3-20-3	Cellular Pathology USSJ5F-20-3
Haematology & Transfusion USSJIT-20-3	Immunology USSJD-20-3	Antimicrobial Agents USSJS-20-3	Sports Physiology USSJ57-20-3	Psychology of Sport & Exercise USPJF7-20-3
Environmental Plant Physiology USSJAS-20-3	Estuarine & Marine Ecosystems USSJAR-20-3	Tropical Forests & Coral Reefs USSJGC-20-3	Sustainability & Resources USSJNM-20-3	Primate Ecology & Conservation USSJYK-20-3
Metals & Living Systems USSJGP-20-3	Controversial Science and Society USSJGR-20-3	Professional practice in Applied Science USSJFL-20-3	1 approved module from the AS scheme	

level 1
Compulsory modules <ul style="list-style-type: none"> • USSJNS-40-1 The Living World • USSJL-20-1 Human Anatomy & Physiology • USSJR6-20-1 Scientific & Analytical Skills • USSJMM-20-1 Cell Biology & Biochemistry • USSJJN-20-1 Genetics & Evolution
Core modules
Optional modules
Interim Awards: <p style="text-align: center;">Certificate of Higher Education: Biological Sciences Credit requirements: 120 (of which 100 are level 1 or above)</p>

level 2
Compulsory modules <ul style="list-style-type: none"> • USSJ4D-20-2 Experimental Design & Analysis
Optional modules Minimum of 3 from... <ul style="list-style-type: none"> • USSJ4F-20-2 Human Physiology • USSJ9Y-20-2 Plant Growth & Survival • USSJ4G-20-2 Biology of Microorganisms • USSJ9X-20-2 Animals & Ecosystems • USSJNB-20-2 Molecular Aspects of Life • USSJ4E-20-2 Immunology & Disease • USSJ4V-20-2 Drugs Disease & Toxicology • USSJKS-20-2 Human Biochemistry & Nutrition • USSJ4Y-20-2 Applied Genetics • USSJ4C-20-2 Molecular Genetics • USSJ9R-20-2 Applied Ecology
<ul style="list-style-type: none"> • 1 Approved modules from the AS scheme
Interim Awards: <p style="text-align: center;">Diploma of Higher Education: Biological Sciences Credit requirements: 240 (of which not less than 100 are level 2 or above and 120 are at level 1 or above)</p>

Year out

The Undergraduate Programmes in Biosciences 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 and Environmental tutors, and the Placements co-ordinator to provide administrative support. The Undergraduate Programmes in Biosciences has 30 years experience in arranging placements for up to 100 students per annum; placements include a number in 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.

Optional modules

- USSJFL-20-3 Professional Practice Module

level 3**Compulsory modules**

- USSJ73-40-3 Project (or 20-credit version)

Core modules**Optional modules**

- USSJIT-20-3 Haematology & Transfusion
- USSJ5E-20-3 Clinical Biochemistry
- USSJJS-20-3 Gene Expression & Cellular Regulation
- USSJ57-20-3 Sports Physiology
- USSJGP-20-3 Metals and Living Systems
- USSJQ-20-3 Pathophysiology of Brain & Body
- USSJ5D-20-3 Immunology
- USSJJR-20-3 Applied Pharmacology
- USSJN3-20-3 Medical Microbiology
- USSJVV-20-3 Applied Genomics
- USSJAS-20-3 Environmental Plant Physiology
- USSJ5F-20-3 Cellular Pathology
- USSJJU-20-3 Cancer Biology & Genetics
- USSJ5S-20-3 Antimicrobial Agents
- USSJNM-20-3 Sustainability & Resources
- USPJF7-20-3 Psychology of Sport & Exercise
- USSJJW-20-3 Molecular & Microbial Biotechnology
- USSJAR-20-3 Estuarine & Marine Ecosystems
- USSJGC-20-3 Tropical Forests & Coral Reefs
- USSJYK-20-3 Primate Ecology & Conservation
- USSJGR-20-3 Controversial Science & Society
- 1 Approved module from the AS scheme

Section 5: Entry requirements

Admission into the Biological Sciences Programme will be administered within the Undergraduate Programmes in Biosciences. Standard offers for entry to the Programme are in the range 180-220 tariff points.

Successful application to the Programme must meet one of the following minimum requirements:

- GCE A level in two science subjects to include Chemistry or a Biology subject, plus grade C or above in three GCSE subjects, to include Maths and English unless compensated for elsewhere
- National Certificate or Diploma in an appropriate subject such as biological sciences
- Pass in a recognised Access or Foundation course.

Additionally, applicants may be admitted to the Programme provided they meet one of the following requirements and can demonstrate to the Faculty attainment equivalent to the GCE A level and GCSE subject areas specified above:

- The Advanced General National Vocational Qualification (AGNVQ) or Advanced General Scottish Vocational Qualification (AGSVQ)
- The Irish Leaving Certificate with Grade C or above in two subjects at Higher level and three subjects at Ordinary level
- The Scottish Leaving Certificate of Education with grade C in three subjects at Higher and grade 3 or above in two subjects at Standard grade or Intermediate 12
- National Vocational Qualifications or Scottish Vocational Qualifications at level 111
- The European Baccalaureate
- The International Baccalaureate
- Compensation through experiential learning
- Other European or International qualifications that the University considers to be of equivalence to the above.

Admission to the part-time, day-release Programme are admitted on the basis of an HNC/D or equivalent in an appropriate subject (typically, Applied Biology).

Section 6: Assessment Regulations

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Section 7: Student learning: distinctive features and support

A Student Handbook is provided during Induction to year 1 that includes information on the Faculty, the University, its regulations and procedures. Subsequently at each level, a structured induction is provided and to enable students to plan their study of modules as effectively as possible a patterned calendar of assessments across the academic year is produced. Detailed information is distributed in guides at the commencement of each module. Students are supported during their time at UWE by academic tutors and their student adviser. For those students who elect to undertake a placement, the sandwich tutor or other members of academic staff makes regular, planned visits to provide support and to liaise with supervisors and assessors. Students on placement may take an optional Professional Practice Module which is managed through an innovative web-based interface designed to support, capture and reward placement learning. The Placements Support Team will oversee the optional placement year, as described in section 4. For all students, access to academic staff and the student advisor is by student e-mail or by personal access, and central University Centre for Student Affairs (CSA) provides support and guidance to students on a wide range of issues. The library at Frenchay campus provides an extensive range of literature for the programme. Students have 24-hour access to computers, and IT support services are available within the Department of Applied Sciences and from the University's Computing Helpdesk. The Faculty, via its Learning Resource Web, has a longstanding investment in web-based support for teaching and learning Learning Resource Web; this provision of supplementary material and access to diagnostic testing of understanding and knowledge will be transferred to UWE's new VLE, Blackboard. The Faculty has a well-equipped range of general laboratories, specialised scientific equipment and specialist facilities appropriate for teaching and research in biosciences, biomedicine, psychology and chemical and physical sciences. Support for laboratory-based scientific inquiry enabled by this provision is enhanced by the core research methods modules that occur within each year. Within this spine, students develop a range of key skills required of a scientist, including literature searches, critical review, research methodology, problem-solving, and IT and communication skills.

Section 8 Reference points/benchmarks

The BSc (Hons) Biological Sciences degree is an important part of the Faculty's Biosciences suite of programmes, since it provides the greatest flexibility of choice within the Bioscience subject-specific taught modules for those students not seeking a specialised award title. The main objective of the Biological Sciences degree is to provide 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 programmes enjoy 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 mission statement of the University of the West of England to “*advance an inclusive, civilised and democratic society and its enrichment through education, consultancy and public service*”. 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.

In its totality, and also by means of specific learning objectives within individual modules, the BSc (Hons) Biological Sciences degree maps consistently against a wide range of entries within the Subject Benchmark Statements for Biosciences.

Through the majority of the modules available to our bioscience 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). Modules such as Metabolic Biochemistry, Molecular Aspects of Life, Immunology & Disease, Cell Pathology, Gene Expression & Cellular Regulation, Human Physiology and Pathophysiology of Brain & Body “*studies at a variety of levels from molecules to populations*” (Biosciences 2.3).

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 2.5). 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 2.6).

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; Scientific & Analytical Skills is taught in the first year, and Experimental Design and Analysis in the second year. This culminates in the final year with a double project module in which a student works with a member of staff on an original piece of research. This strand addresses Biosciences 2.5 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 2.7), 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 2.8) 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). We fully recognise that the practise of bioscience occurs primarily in the laboratory, and we have a strong tradition of providing students with a solid training in the laboratory techniques that permit 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 primarily laboratory-based, the students spend approximately half their contact time within the teaching/research laboratories; we, therefore, offer “*appropriate opportunities to participate in collecting data by undertaking experiments and practical investigations*” (Biosciences 2.7).

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 Virtual Learning Environment as a learning resource to consolidate learning. For laboratory work (Biosciences 4.4) within modules as diverse as Scientific & Analytical Skills and Human Anatomy & Physiology, 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 Experimental Design & Analysis in the second year and the Research Project double module in the final year 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.

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 (eg 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 (good).

- *demonstrated ability in a range of appropriate practical techniques and skills relevant to research in biosciences.*

This will include the ability to place the work in context and to suggest lines of further investigation; Second year Human Physiology, Experimental Design & Analysis, Microbiology, Molecular Aspects of Life, Immunology & Disease, Drugs & Disease, Plant Growth & Survival, Applied Genetics, Molecular Genetics, Human Nutrition, and final year Research Project double module.

- be able to plan, execute and present an independent piece of work (eg 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 double module.

- be able to apply relevant advanced numerical skills (including statistical analysis where appropriate) to biological data;

First year Scientific & Analytical Skills, second year Experimental Design & Analysis and the majority of Final year projects.

- have well-developed strategies for updating, maintaining and enhancing their knowledge of the biosciences.

Implicit in all subject-specific modules and the Final year project.

Staff in the Faculty are research active and consequently, programme development, formal teaching and project work is underpinned and informed by current research. Thus, all staff contributing to the Applied 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 Psychology disciplines which is encouraged and maintained by Faculty Research Centres such as CRIB (Research in Biomedicine), CRIPS (Research in Plant Sciences) and CADR (Appearance & Disfigurement Research). There is active collaboration between bioscientists, physicists and chemists within the Faculty of Applied Sciences, and also between these staff and those in other Faculties such as Computing, Engineering and Mathematical Sciences. These multidisciplinary groups reflect the developments alluded to in Biosciences 2.3, and are likely to inform teaching within the Biosciences programme.

Overall, Applied 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 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. These are available on the University Intranet.

Programme monitoring and review may lead to changes to approved programmes. There may be a time lag between approval of such changes/modifications and their incorporation into an authorised programme specification. Enquiries about any recent changes to the programme made since this specification was authorised should be made to the relevant Faculty Administrator.