

Programme Specification

BSc (Hons) Biomedical Sciences (2020-21)

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 they take full advantage of the learning opportunities that are provided.

Awarding Institution	University of Southampton
Teaching Institution	University of Southampton
Mode of study	Full-time
Duration in years	3 years, following standard progression for a FT student
Accreditation details	Not currently applicable – but aligned with RSB guidelines
Final award	Bachelor of Science - Honours
Name of award	Biomedical Sciences
Interim Exit awards	Bachelor of Science (Ordinary) Diploma of Higher Education Certificate of Higher Education
FHEQ level of final award	6
UCAS code	B940
Programme code	8575
QAA Subject Benchmark or other external reference	QAA Subject Benchmark Statements Biomedical Sciences 2019, Biosciences 2019
Programme Lead	Dr Philip Williamson

Programme Overview

Brief outline of the programme

Biomedical Sciences covers all the scientific disciplines that underpin medicine. Our degree programme focuses on the biochemical, physiological and pathological aspects as applied to normal and disease states. Graduates in biomedical sciences are in demand in a variety of areas of employment. You will undertake a balanced programme where you will gain the relevant practical skills and academic knowledge required for a career in this subject area.

Your contact hours will vary depending on your module/option choices. Full information about contact hours is provided in individual module profiles

Learning and teaching

You will be taught in a research-led environment through a combination of lectures, tutorials, practical classes, coursework and extended projects which enhance your knowledge of the subject area and provide you with the skills to embark on a career in the field of Biomedical Sciences. Throughout the programme you will undertake independent reading both to supplement and consolidate the taught material and to broaden your knowledge and understanding of Biomedical Sciences.

Assessment

You will be assessed by a combination of continuous assessment and written examinations at the end of each semester to test your knowledge and understanding of the lecture and tutorial material. Continuous assessment is based on performance in tutorials, practicals and projects.

Special Features of the programme

A major highlight of the programme is the opportunity to conduct a research-based project in the final year of your degree programme. During the course of the project you undertake a novel research project under the supervision of one of our academics, with the opportunity to work in

some of our world-class research facilities. For those aspiring to develop a career outside of the laboratory there are a number of specialist modules looking at the role of Biosciences in Education, Ethics, Communication and Industry.

Please note: As a research-led University, we undertake a continuous review of our programmes to ensure quality enhancement and to manage our resources. As a result, this programme may be revised during a student's period of registration; however, any revision will be balanced against the requirement that the student should receive the educational service expected. Please read our [Disclaimer](#) to see why, when and how changes may be made to a student's programme.

Programmes and major changes to programmes are approved through the University's [programme validation process](#) which is described in the University's [Quality handbook](#).

Educational Aims of the Programme

The aims of the programme are to provide:

1. a stimulating, informed environment achieved by offering a wide range of interesting and contemporary modules providing flexibility and choice, while allowing you to focus increasingly as you progress from level to level;
2. a sound scientific knowledge base in Biochemistry and Physiology;
3. an ability to describe and comment on specific aspects of current research in biomedical sciences;
4. training in biochemical and physiological laboratory skills;
5. an opportunity to develop a range of transferable skills (information and communication technology, team working, written and oral communication, time management, planning, data collection and presentation);
6. opportunities to develop your skills of critical thinking and to show that you can pursue independent study;
7. an opportunity to undertake an independent project on a biomedical topic;
8. an education and training suitable for a wide variety of careers and that will prepare you for higher degrees and careers in biomedical research – or graduate entry to medicine;
9. the capability of life-long learning, study and enquiry.

Programme Learning Outcomes

For a list of modules to be taken to meet the learning outcomes for interim exit qualifications refer to Appendix 2.

Knowledge and Understanding

Having successfully completed this programme you will be able to demonstrate knowledge and understanding of:

Systems Physiology

- A1. the principal functions of the major organs in the body;
- A2. the respiratory, cardiovascular, gastrointestinal, reproductive and renal systems;
- A3. muscles and the control of muscle contraction;
- A4. the regulation of blood flow and the formation of new blood vessels;
- A5. the cellular interactions which underlie the immune response in normal and pathophysiology;
- A6. the nervous system;

Homeostasis and Cell Communication

- A7. the principles of homeostasis;
- A8. hormones and their importance in physiological processes;
- A9. cell-cell communication in the autocrine, paracrine, endocrine and nervous systems;
- A10. cell signalling pathways
- A11. immunology and use of antibodies;
- A12. cell signalling in normal and patho-physiology

Biochemistry and Molecular Biology

- A13. how the information stored in DNA is used to make proteins;
- A14. the basic principles of molecular cell biology;
- A15. the properties of enzymes;
- A16. the genome and its study in normal and patho-physiology;
- A17. the regulation of gene transcription
- A18. production of recombinant therapeutic proteins
- A19. the pathways involved in the metabolism of carbohydrates, fats and proteins and metabolic diseases;
- A20. how the various metabolic pathways are integrated in the body;
- A21. the molecular basis of disease
- A22. pharmacology
- A23. the chemistry underpinning the life sciences, and the techniques used to study it

Essential Cell Biology

- A24. composition and spatial organisation of the cell;
- A25. the major organelle systems in cells;
- A26. mitosis, meiosis and cell division;
- A27. genetic inheritance and transmission;
- A28. cell determination and differentiation.

Teaching and Learning Methods

You will be taught through a combination of lectures, tutorials, practical classes, coursework and projects. In Part 3 you will undertake an independent research project. Throughout the programme you will undertake independent reading both to supplement and consolidate the taught material and to broaden your knowledge and understanding of Biomedical Sciences.

Assessment methods

You will be assessed by a combination of continuous assessment and written examinations at various points in each semester to test your knowledge and understanding of the lecture and tutorial material. Continuous assessment is based on performance in tutorials, practicals and projects including dissertations, and oral and written (e.g. poster) presentations.

Subject Specific Intellectual and Research Skills

Having successfully completed this programme you will be able to:

- B1. formulate and test hypotheses by planning, conducting and reporting a programme of biomedical research;
- B2. use a range of biomedical laboratory equipment to generate data;
- B3. use computer software to record and analyse biomedical sciences data and determine their importance and validity;
- B4. analyse and solve complex biomedical sciences problems;
- B5. integrate your biomedical sciences knowledge base with other selected disciplines such as biochemistry, neuroscience and pharmacology;
- B6. integrate and evaluate biomedical sciences data from a variety of sources, including primary source material in biomedical sciences journals;
- B7. understand how the boundaries of biomedical sciences knowledge are advanced through research;
- B8. assess how your work can have consequences for yourself, others around you, and the general public.

Teaching and Learning Methods

In addition to the methods described above, you will be supervised in practical classes and during your final year project(s). As part of your final year project(s) you will be guided in critically reviewing the relevant literature.

Assessment methods

Your subject specific skills will be assessed as described above. Experimental and research skills are assessed through an appropriate combination of laboratory or project reports and presentations.

Transferable and Generic Skills

Having successfully completed this programme you will be able to:

- C1. communicate/present effectively both verbally and in writing on a range of topics in biomedical sciences to both specialised and non-specialised audiences;
- C2. work as a member of a team;
- C3. use information technology and other resources to find, extract and synthesise information;
- C4. solve problems relating to qualitative and quantitative information;
- C5. learn independently through critical enquiry;
- C5. demonstrate you have the ability to undertake appropriate further training;
- C6. manage resources and time.

Teaching and Learning Methods

You will be helped to acquire these skills through aspects of the formal teaching programme. In the early years this will mainly be through tutorial and coursework, whilst in Part 3 your project work will give you ample opportunity to further develop and practice many of the individual skills in one major activity.

Assessment methods

Your transferable and generic skills will be assessed primarily through continuous assessment and through your Part 3 project.

Subject Specific Practical Skills

Having successfully completed this programme you will be able to:

- D1. demonstrate competency in using laboratory skills in a safe a responsible manner
- D2. demonstrate competency in a range of modern biomedical techniques.

Programme Structure

The programme structure table is below:

Information about pre and co-requisites is included in individual module profiles.

Where optional modules have been specified, the following is an indicative list of available optional modules, which are subject to change each academic year. Please note in some instances modules have limited spaces available.

BSc (Hons) Biomedical Sciences

Part I

Compulsory

BIOL1024	Fundamentals of Biochemistry	15 ECTS	Compulsory
BIOL1025	Fundamentals of Cell Biology and Physiology	15 ECTS	Compulsory
BIOL1026	Chemistry of Life	15 ECTS	Compulsory
BIOL1030	How to think like a scientist	7.5 ECTS	Compulsory
BIOL1027	The Human Genome and Disease	7.5 ECTS	Compulsory

Part II

Compulsory

BIOL2022	Immunology, Infection and Inflammation	7.5 ECTS	Comp
BIOL2010	Flow of Genetic Information	7.5 ECTS	Comp
BIOL2048	Principles of Pharmacology	7.5 ECTS	Comp
or			
BIOL2049	Pharmacology ²	15 ECTS	
BIOL2056	Cell Biology	7.5 ECTS	Comp

Optional

(choose sufficient modules to make 60 ECTS when combined with the compulsory modules above)*

BIOL2051	Principles of Neuroscience or Neuroscience ²	7.5 ECTS	Optional
BIOL2052		15 ECTS	
BIOL2012	Exploring Proteins	7.5 ECTS	Optional
BIOL2013	Bioinformatics	7.5 ECTS	Optional

BIOL2044	Medical Microbiology	7.5 ECTS	Optional
BIOL2053	Environmental Biochemistry	7.5 ECTS	Optional
BIOL2045	Vertebrate Development	7.5 ECTS	Optional

*Further options within and outside of the School of Biological Sciences are available. A maximum of TWO elective modules can be selected from a range of suitable courses from Schools other than Biological Sciences, but no more than one UOSM should be taken. We strongly encourage you to discuss electives with your tutor before pursuing such options.

²Students taking 15 ECTS module are expected to choose their modules at the start of the AY as per normal. Should a student choose to not continue with the 15 ECTS module in S2, then they will be awarded the mark obtained at the end of S1 for the equivalent 7.5ECTS module, and be expected to choose another 7.5ECTS module by the end of the 2nd week of S2.

Part III

Optional Core (Once selected, these become core and must be passed at 40%)

BIOL3034 or	Laboratory research project	15 ECTS	Optional Core
BIOL3058 or	Bioscience and Business	15 ECTS	Optional Core
BIOL3059 or	Bioscience in Education	15 ECTS	Optional Core
BIOL3069	In-silico research project	15 ECTS	Optional Core
Or two from the following			
BIOL3060	Scientific Communication	7.5 ECTS	Optional Core
BIOL3066	Extended Scientific Communication (to be taken with BIOL3060)	7.5 ECTS	Optional Core
BIOL3031/32	Literature project (only one literature project can be taken)	7.5 ECTS	Optional Core
BIOL3073	Bioethics Project	7.5 ECTS	Optional Core

Optional (Please choose 6)*

BIOL3001	Current topics in Cell Biology	7.5 ECTS	Optional
BIOL3014	Molecular Cell Biology	7.5 ECTS	Optional
BIOL3015	Regulation of Gene Expression	7.5 ECTS	Optional
BIOL3021	Cellular and Molecular Neuroscience	7.5 ECTS	Optional
BIOL3025	Neuropharmacology of CNS Disorders	7.5 ECTS	Optional
BIOL3026	Selective Toxicity	7.5 ECTS	Optional
BIOL3037	Immunology	7.5 ECTS	Optional

BIOL3043	Cellular and Molecular Pathology	7.5 ECTS	Optional
BIOL3063	Bioinformatics and System Biology	7.5 ECTS	Optional
BIOL3064	Cancer and Chromosome Biology	7.5 ECTS	Optional
BIOL3067	Evolution and Development	7.5 ECTS	Optional
BIOL3006	Cellular and Genetic Aspects of Animal Development	7.5 ECTS	Optional
BIOL3013	Molecular Recognition	7.5 ECTS	Optional
BIOL3017	The Molecular and Structural Basis of Disease	7.5 ECTS	Optional
BIOL3018	Molecular Pharmacology	7.5 ECTS	Optional
BIOL3020	Systems Neuroscience	7.5 ECTS	Optional
BIOL3022	Cell Signalling in Health and Disease	7.5 ECTS	Optional
BIOL3044	Developmental Origins of Health and Disease	7.5 ECTS	Optional
BIOL3048	Neurodegenerative Disease	7.5 ECTS	Optional
BIOL3052	Biomedical Technology	7.5 ECTS	Optional
BIOL3057	Biofilms and Microbial Communities	7.5 ECTS	Optional
BIOL3065	Biomedical Parasitology	7.5 ECTS	Optional

*Further options within and outside of the School of Biological Sciences are available. A maximum of TWO elective modules can be selected from a range of suitable courses from Schools other than Biological Sciences, but no more than one UOSM should be taken. We strongly encourage you to discuss electives with your tutor before pursuing such options.

Typical course content

Our BSc Biomedical Sciences degree is a highly flexible programme, allowing you to combine interests in biochemistry, physiology, neuroscience, cell biology, genetics, developmental biology and pharmacology. The fixed 1st year provides a broad and robust foundation to the field of Biomedical Sciences whilst the 2nd and 3rd years provide you with the opportunity to develop your interests in particular areas of the field. Part 1 is common with both the Biochemistry, Neuroscience and Pharmacology programmes and thus offers the flexibility to change degree programme at the end of Part I.

Optional modules are to be chosen according the guidelines laid out for the individual Parts as described above. Should you wish to progress onto the full time Masters programme at the end of their 3rd year you must have met the required standard of 60% or more at the end of the 2nd year and taken either BIOL3034 or BIOL3069 for your Part 3 project.

The emphasis is on the science that underpins and advances clinical practice, rather than the technical basis of routine laboratory tests. Human disease is studied at all levels, from genetic mutations through organ degeneration, such as the brain in Alzheimer's disease, up to whole-body

metabolic disorders like diabetes. The programme offers an ideal preparation for a graduate career in medicine, clinically related professions or a career in basic, clinical or medical research.

Our staff are involved in research in biochemistry, molecular basis of disease, cell biology, oncology, developmental biology, neurobiology, immunology and infectious disease and we have exceptionally good research facilities which you will be able to access during your Part 3 project.

The option modules shown above constitute an indicative list; there will always be choice but the options might vary between years. A full list of modules and rules will be available to you via the Student Record Self-Service system once you enrol at the University.

Progression Requirements

The programme follows the University's regulations for *[Progression, Determination and Classification of Results : Undergraduate and Integrated Masters Programmes](#)*. Any exemptions or variations to the University regulations, approved by AQSC are located in [section VI of the University Calendar](#).

Intermediate exit points

You will be eligible for an interim exit award if you complete part of the programme but not all of it, as follows:

Qualification	FHEQ level	Minimum overall credit in ECTS credits	Minimum ECTS credits required at level of award
Ordinary degree	6	at least 150	30
Diploma of Higher Education	5	at least 120	45
Certificate of Higher Education	4	at least 60	45

Learning outcomes specific to each intermediate exit point correspond to a sub-set of those for the programme as a whole and may be determined by consulting the module map at the end of this document.

Support for student learning

There are facilities and services to support your learning some of which are accessible to students across the University and some of which will be geared more particularly to students in your particular School or discipline area.

The University provides:

- library resources, including e-books, on-line journals and databases, which are comprehensive and up-to-date; together with assistance from Library staff to enable you to make the best use of these resources
- high speed access to online electronic learning resources on the Internet from dedicated PC Workstations onsite and from your own devices; laptops, smartphones and tablet PCs via the Eduroam wireless network. There is a wide range of application software available from the Student Public Workstations.
- computer accounts which will connect you to a number of learning technologies for example, the Blackboard virtual learning environment (which facilitates online learning and access to specific learning resources)
- standard ICT tools such as Email, secure filestore and calendars.
- access to key information through the MySouthampton Student Mobile Portal which delivers timetables, Module information, Locations, Tutor details, Library account, bus timetables etc. while you are on the move.
- IT support through a comprehensive website, telephone and online ticketed support and a dedicated helpdesk in the Hartley Library.
- Enabling Services offering support services and resources via a triage model to access crisis management, mental health support and counselling. Support includes daily Drop In at Highfield campus at 13.00 – 15.00 (Monday, Wednesday and Friday out of term-time) or via on-line chat on weekdays from 14.00 – 16.00. Arrangements can also be made for meetings via Skype.
- assessment and support (including specialist IT support) facilities if you have a disability, long term health problem or Specific Learning Difficulty (e.g. dyslexia)

- the Student Services Centre (SSC) to assist you with a range of general enquiries including financial matters, accommodation, exams, graduation, student visas, ID cards
- Careers and Employability services, advising on job search, applications, interviews, paid work, volunteering and internship opportunities and getting the most out of your extra-curricular activities alongside your degree programme when writing your CV
- Other support that includes health services (GPs), chaplaincy (for all faiths) and 'out of hours' support for students in Halls and in the local community (18.00-08.00)
- A [Centre for Language Study](#), providing assistance in the development of English language and study skills for non-native speakers.

The Students' Union provides

- an academic student representation system, consisting of Course Representatives, Academic Presidents, Faculty Officers and the Vice-President Education; SUSU provides training and support for all these representatives, whose role is to represent students' views to the University.
- opportunities for extracurricular activities and volunteering
- an Advice Centre offering free and confidential advice including support if you need to make an academic appeal
- Support for student peer-to-peer groups, such as [Nightline](#).

Associated with your programme you will be able to access:

- An induction programme at the start of the course, which will provide orientation, information on modules, courses, library and computer facilities.
- Handbooks, module handbooks and material on the web.
- Library and academic skill packages.
- Well-equipped laboratories.
- Academic and pastoral support from members of staff, including your personal academic tutor which will include scheduled meetings at appropriate occasions during the academic year.
- Access to all administrative and academic material on the CBS, Programme and individual module web sites and/or Blackboard (<http://www.blackboard.soton.ac.uk>).
- Access to all academic staff through an appointment system and e-mail.
- Access to administrative staff in the Faculty Student Offices during the normal working day.
- Feedback on assessment.

Methods for evaluating the quality of teaching and learning

You will have the opportunity to have your say on the quality of the programme in the following ways:

- Completing module evaluation questionnaires for each module of the programme.
- Acting as a student representative on various committees, e.g. Staff/Student Liaison Committees, School Programmes Committee OR providing comments to your student representative to feed back on your behalf.
- Serving as a student representative on Faculty Scrutiny Groups for programme validation.
- Taking part in programme validation meetings by joining a panel of students to meet with the Faculty Scrutiny Group.

Further details on the University's quality assurance processes are given in the [Quality Handbook](#).

Career Opportunities

With a BSc Biomedical Sciences degree you could be expected to find work in the following areas:

- Laboratory scientist in forensic, pathology, veterinary, toxicology or haematology laboratory
- Research in academic, pharmaceutical and biotechnology sectors
- Business, legal or management roles in health care and health and safety
- Clinical research organisations running clinical trials and surveys
- Graduate entry to medical, dental or veterinary school
- Graduate assistant role to physicians or other health professionals
- Laboratory science in NGOs and voluntary services overseas

- Science writer or journalist in biological and biomedical topics
- Teaching science nationally and internationally

External Examiner(s) for the programme

Name: Prof Gavin Woodhall
Institution: Aston University

Name: Prof Ulrike Mayer
Institution: University of East Anglia

Students must not contact External Examiner(s) directly, and external examiners have been advised to refer any such communications back to the University. Students should raise any general queries about the assessment and examination process for the programme with their Course Representative, for consideration through Staff/Student Liaison Committee in the first instance, and Student representatives on Staff/Student Liaison Committees will have the opportunity to consider external examiners' reports as part of the University's quality assurance process.

External examiners do not have a direct role in determining results for individual students, and students wishing to discuss their own performance in assessment should contact their Personal Academic Tutor in the first instance.

Please note: 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 they takes full advantage of the learning opportunities that are provided. More detailed information can be found in the programme handbook.

Appendix 1:

Additional Costs

Students are responsible for meeting the cost of essential textbooks, and of producing such essays, assignments, laboratory reports and dissertations as are required to fulfil the academic requirements for each programme of study. In addition to this, students registered for this programme also have to pay for:

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
Approved Calculators		Candidates may use calculators in the examination room only as specified by the University and as permitted by the rubric of individual examination papers. The University approved models are Casio FX-570 and Casio FX-85GT Plus. These may be purchased from any source and no longer need to carry the University logo.
Stationery		You will be expected to provide your own day-to-day stationery items, e.g. pens, pencils, notebooks, etc). Any specialist stationery items will be specified under the Additional Costs tab of the relevant module profile.
Textbooks		Where a module specifies core texts these should generally be available on the reserve list in the library. However due to demand, students may prefer to buy their own copies. These can be purchased from any source. Some modules suggest reading texts as optional background reading. The library may hold copies of such texts, or alternatively you may wish to purchase your own copies. Although not essential reading, you may benefit from the additional reading materials for the module.
Equipment and Materials Equipment	Laboratory Equipment and Materials:	All materials required for laboratory work are provided. Where necessary, suitable specialist safety equipment will be provided.
IT	Computer Discs and USB Drives	Students are expected to provide their own portable data storage device.
	Software Licenses	All software is provided
	Hardware	It is advisable that students provide their own laptop or personal computer, although shared facilities are available across the University campus.
Clothing	Lab Coats and safety spectacles	One laboratory coat and a pair of safety spectacles are provided at the start of the programme to each student. If these are lost the student must replace them at their own expense. The Students Union Shop stock these items.
Printing and Photocopying Costs		Coursework such as essays; projects; dissertations may be submitted on line. In the majority of cases, though, students will be asked to provide a printed copy. The School of Biological Sciences a printing credit for printing lecture handouts. The University printing costs are currently: A4 - 4p per side (black and white) or 18p per side (colour)

Main Item	Sub-section	PROGRAMME SPECIFIC COSTS
		<p>A3 - 8p per side (black and white) or 35p per side (colour)</p> <p>Please Note: Paper sizes not recognised by the printing devices will prompt you to select the size and then charge a minimum of 50p per black and white copy and a maximum of £1 per colour copy. You can pay for your printing by using the money loaders or by using print copy payment service by going to www.printcopypayments.soton.ac.uk Please remember that we are unable to refund any credit that has not been used by the end of your course, so please consider this when topping up your printing/copy account</p> <p>The University Print Centre also offers a printing and copying service as well as a dissertation/binding service. Current printing and copying costs can be found here. They also provide a large format printing service, e.g. Academic posters. Details of current costs can be found here.</p>
<p>Placements (including Study Abroad Programmes)</p>		<p>Students who choose to go on an industrial placement at the end of Part 2 can expect to cover costs for health and travel insurance, accommodation and living expenses; travel costs; visa costs.</p> <p>This will vary depending on which country you are travelling to.</p>
<p>Parking Costs</p>		<p>There may be a requirement to undertake work at Southampton General Hospital (SGH), for example during a final year research project. Students may need to cover costs for transport to travel to SGH or for car parking.</p>

In some cases you'll be able to choose modules (which may have different costs associated with that module) which will change the overall cost of a programme to you. Details of such costs will be listed in the Module Profile. Please also ensure you read the section on additional costs in the University's Fees, Charges and Expenses Regulations in [Section IV of the University Calendar](#).

Appendix 1:

Modules required for interim exit qualifications

Modules required for: Certificate of Higher Education

Part 1: All Compulsory (60 ECTS)

BIOL1024	Fundamentals of Biochemistry	15 ECTS	Compulsory
BIOL1025	Fundamentals of Cell Biology and Physiology	15 ECTS	Compulsory
BIOL1026	Chemistry of Life	15 ECTS	Compulsory
BIOL1030	How to think like a scientist	7.5 ECTS	Compulsory
BIOL1027	The Human Genome and Disease	7.5 ECTS	Compulsory

Modules required for: Diploma of Higher Education

Part 2: 60 ECTS (45 ECTS at Level 5)

Compulsory

BIOL2022	Immunology, Infection and Inflammation	7.5 ECTS	Compulsory
BIOL2010	Flow of Genetic Information	7.5 ECTS	Compulsory
BIOL2048	Principles of Pharmacology	7.5 ECTS	Compulsory
BIOL2049	Pharmacology	15 ECTS	
BIOL2056	Cell Biology	7.5 ECTS	Compulsory

Optional

BIOL2051	Principles of Neuroscience	7.5 ECTS	Optional
BIOL2052	Neuroscience	15 ECTS	
BIOL2044	Medical Microbiology	7.5 ECTS	Optional
BIOL2053	Environmental Biochemistry	7.5 ECTS	Optional
BIOL2018	Adaptive Physiology	7.5 ECTS	Optional
BIOL2045	Vertebrate Development	7.5 ECTS	Optional

Qualification obtained: Ordinary Degree

Part 3: 30 ECTS (30 ECTS at Level 6)

BIOL3034 or	Laboratory research project	15 ECTS	Optional Core
BIOL3058 or	Bioscience and Business	15 ECTS	Optional Core
BIOL3059 or	Bioscience in Education	15 ECTS	Optional Core
BIOL3069	In-silico research project	15 ECTS	Optional Core

Or two from the following

BIOL3060	Science Communication	7.5 ECTS	Optional Core
BIOL3066	Extended Science Communication (to be taken with BIOL3060)	7.5 ECTS	Optional Core
BIOL3031 or 32	Literature project	7.5 ECTS	Optional Core
BIOL3073	Bioethics Project	7.5 ECTS	Optional Core

**Optional:*

BIOL3001	Current topics in Cell Biology	7.5 ECTS	Optional
BIOL3014	Molecular Cell Biology	7.5 ECTS	Optional
BIOL3015	Regulation of Gene Expression	7.5 ECTS	Optional
BIOL3021	Cellular and Molecular Neuroscience	7.5 ECTS	Optional
BIOL3025	Neuropharmacology of CNS Disorders	7.5 ECTS	Optional
BIOL3026	Selective Toxicity	7.5 ECTS	Optional
BIOL3037	Immunology	7.5 ECTS	Optional
BIOL3043	Cellular and Molecular Pathology	7.5 ECTS	Optional
BIOL3063	Bioinformatics and System Biology	7.5 ECTS	Optional
BIOL3064	Cancer and Chromosome Biology	7.5 ECTS	Optional
BIOL3067	Evolution and Development	7.5 ECTS	Optional
BIOL3006	Cellular and Genetic Aspects of Animal Development	7.5 ECTS	Optional
BIOL3013	Molecular Recognition	7.5 ECTS	Optional
BIOL3017	The Molecular and Structural Basis of Disease	7.5 ECTS	Optional

BIOL3018	Molecular Pharmacology	7.5 ECTS	Optional
BIOL3020	Systems Neuroscience	7.5 ECTS	Optional
BIOL3022	Cell Signalling in Health and Disease	7.5 ECTS	Optional
BIOL3044	Maternal, Fetal and Neonatal Physiology	7.5 ECTS	Optional
BIOL3048	Neurodegenerative Disease	7.5 ECTS	Optional
BIOL3052	Biomedical Technology	7.5 ECTS	Optional
BIOL3057	Biofilms and Microbial Communities	7.5 ECTS	Optional
BIOL3065	Biomedical Parasitology	7.5 ECTS	Optional

*Further options within and outside of the School of Biological Sciences are available. A maximum of TWO elective modules can be selected from a range of suitable courses from Schools other than Biological Sciences, but no more than one UOSM should be taken. We strongly encourage you to discuss electives with your tutor before pursuing such options.

Appendix 3:

Programme Map: BSc (Hons) Biomedical Sciences.

Programme Specification Learning Outcomes	Fundamentals of Biochemistry (BIOL1024)	Fundamentals of Cell Biology and Physiology (BIOL1025)	Chemistry of Life (BIOL1026)	The Human Genome and Disease (BIOL1027)	How to think like a scientist (BIOL1030)	Flow of Genetic Information (BIOL2010)	Principles of Pharmacology (BIOL2048)	Cell Biology (BIOL2056)	Immunology, Infection and Inflammation (BIOL2022)	Laboratory Research Project (BIOL3034)	Bioscience Business (BIOL3058)	Bioscience Education (BIOL3059)	In-silico Project (BIOL3069)	or	Two from			
	Science Communication (BIOL3060)	Extended Science Communication (BIOL3066)	Literature Based Research Project (BIOL3031/32)	Bioethics Project (BIOL3073)														
Knowledge and Understanding																		
Systems Physiology																		
A1. The principal function of the major organs in the body		X																
A2. The respiratory, cardiovascular, gastrointestinal, reproductive and renal systems		X																
A3. The muscles and the control of muscle contractions		X																
A4. The regulation of blood flow and the formation of new blood vessels		X																
A5. The cellular interactions which underlie the immune response in normal and	X	X					X		X									

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															Science Communication (BIOL3060)	Extended Science Communication (BIOL3066)	Literature Based Research Project (BIOL3031/32)	Bioethics Project (BIOL3073)
<i>pathophysiology</i>																		
A6. <i>The nervous system</i>	X	X					X											
Homeostasis and Cell Communication																		
A7. <i>The principles of homeostasis</i>	X	X																
A8. <i>Hormones and their importance in physiological processes</i>	X	X					X											
A9. <i>Cell-cell communications in the autocrine, endocrine and nervous system</i>	X	X						X										
A10. <i>Cell signalling pathways</i>	X	X					X											
A11. <i>Immunology and use of antibodies</i>	X	X							X									
A12. <i>Cell signalling normal and pathophysiology</i>	X	X						X										
Biochemistry and Molecular Biology																		
A13. <i>How the basic information stored in DNA is used to make protein</i>	X					X												

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A14. The basic principles of molecular cell biology	X	X				X												
A15. the properties of enzymes	X		X			X												
A16. The genome and its study in normal and pathophysiology	X			X														
A17. The regulation of gene transcription	X					X												
A18. Production of recombinant protein	X					X												
A19. The pathways involved in the metabolism of carbohydrates, fats and proteins and metabolic diseases	X	X																
A20. How the various metabolic processes are integrated within the body	X	X																
A21. The molecular basis of disease.	X	X																
A22. Pharmacology	X						X											
A23. Chemistry underpinning the life sciences, and the	X		X		X													

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<i>techniques used to study it</i>																		
Essential Cell Biology																		
<i>A24. Composition and spatial organisation of the cell.</i>		X																
<i>A25. The major organelle systems in the cell</i>		X																
<i>A26. Mitosis, Meiosis, and Cell Division</i>		X																
<i>A27. Genetic inheritance and transmission</i>		X		X														
<i>A28. Cell determination and differentiation.</i>		X		X														
Subject Specific Intellectual and Research Skills																		
<i>B1. formulate and test hypotheses by planning, conducting and reporting a programme of biomedical research;</i>					X		X			X	X	X	X					X
<i>B2. use a range of biomedical laboratory equipment to generate data;</i>	X	X			X	X	X			X								

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B3. use computer software to record and analyse biomedical sciences data and determine their importance and validity;	X	X			X	X	X			X			X					
B4. analyse and solve complex biomedical sciences problems;	X	X	X		X	X	X		X	X	X	X	X				X	X
B5. integrate your biomedical sciences knowledge base with other selected disciplines such as biochemistry, neuroscience and pharmacology;	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
B6. integrate and evaluate biomedical sciences data from a variety of sources, including primary source material in biomedical sciences journals;							X		X	X	X	X	X		X	X	X	X
B7. understand how the boundaries of biomedical sciences knowledge are advanced through research;										X	X	X	X		X	X	X	X
B8. Assess how your work can have consequences for yourself, others around										X								

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<i>you and the general public</i>																		
Transferable and Generic Skills																		
<i>C1. communicate/present effectively both verbally and in writing on a range of topics in biomedical sciences to both specialised and non-specialised audiences;</i>					X	X	X			X	X	X	X		X	X	X	
<i>C2. work as a member of a team;</i>					X		X			X	X					X		
<i>C3. use information technology and other resources to find, extract and synthesise information;</i>										X	X	X	X		X	X	X	
<i>C4. solve problems relating to qualitative and quantitative information;</i>					X		X			X			X			X		
<i>C5. learn independently through critical enquiry;</i>										X	X	X	X		X	X	X	
<i>C6. demonstrate you have the ability to undertake</i>										X	X	X	X		X	X	X	

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<i>appropriate further training;</i>																		
<i>C7. manage resources and time.</i>	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Subject Specific																		
<i>D1. demonstrate competency in using laboratory skills in a safe a responsible manner</i>	X				X					X								
<i>D2. demonstrate competency in a range of modern biomedical techniques.</i>	X	X			X		X			X			X					