



The
University
Of
Sheffield.

Programme Specification

A statement of the knowledge, understanding and skills
that underpin a taught programme of study leading to
an award from
The University of Sheffield

Programme Details

| | |
|---|--|
| 1. Programme title | Biological Sciences |
| 2. Programme code | BISU16 (BSc); BISU18 (MBiolSci) |
| 3. QAA FHEQ level | Honours |
| 4. Faculty | Science |
| 5. Department | School of Biosciences |
| 6. Other departments providing credit bearing modules for the programme | Psychology School of Medicine and Population Health |
| 7. Accrediting Professional or Statutory Body | None |
| 8. Date of production/revision | March 2021, April 2022, September 2023 |

| Awards | Type of award | Duration |
|-------------------------|---------------|------------------|
| 9. Final award | BSc, MBiolSci | 3 years, 4 years |
| 10. Intermediate awards | | |
| | | |

Programme Codes

| | | | |
|---|--------|------|--|
| 11. JACS code(s) <i>Select between one and three codes from the HESA website.</i> | C100 | C109 | |
| 12. HECoS code(s) <i>Select between one and three codes from the HECoS vocabulary.</i> | 100346 | | |

Programme Delivery

| | |
|----------------------|--------------|
| 13. Mode of study | Full-time |
| 14. Mode of delivery | Face to Face |

15. Background to the programme and subject area

Biological Sciences, the “Science of Life”, is concerned with understanding the diversity of life at its many different levels of organisation. The study of biology has led to an understanding of the natural world and our impact on it and has been central to many advances in modern medicine. Biological Science is becoming increasingly relevant to modern society as it seeks to address the important issues of the 21st century, including global climate change, pollution, wildlife conservation, genetically modified organisms, cloning and disease outbreaks. Because Biological Science is such a large subject, it is divided into modules based on either the type of organisms studied (animal, plant or microorganism) or the level of organisation studied (biochemical, molecular, cellular, genetic, physiological or ecological).

The Biological Sciences programme at Sheffield is designed to provide a broadly based and flexible approach to biology, enabling students to select from subject areas at all major taxonomic and organisational levels. It provides opportunities for studying the key aspects of a wide range of biological disciplines from the basic building blocks of life up to the organisation of whole ecosystems. Students can take modules in Biochemistry, Molecular Biology, Genetics, Cell Biology, Microbiology, Plant Science, Zoology, Physiology, Pathobiology, Developmental Biology, Neuroscience, Ecology, Conservation Biology, Climate Change and Sustainability. They can organise their programme to maintain a broad overview, or they can focus on areas of specialisation towards the end of their degree. Members of the School of Biosciences teach the Biological Sciences programme. We are one of the largest in the UK devoted to the study of biology and have been graded excellent in both teaching and research.

Graduates in Biological Sciences are qualified for a wide variety of careers. Opportunities will depend on the range of topics studied, but in all cases, students will have developed a wide range of subject specific and generic skills that can be transferred to both biological and non-biological employment.

16. Programme aims

| | |
|---|--|
| The BSc and MBiolSci Biological Sciences Programmes aim to: | |
| A1 | Provide teaching that is informed and invigorated by the research and scholarship of its staff, is stimulating to and enjoyed by students. |
| A2 | Develop in students an independence of thought, intellectual curiosity and critical approach to evidence, theories and concepts. |
| A3 | Enable students to maximise their academic potential in all aspects of their programme. |
| A4 | Assess students over a range of skills and identify support and encourage academic excellence. |
| A5 | Impart to students an awareness of the importance of commitment to and skills relevant for life-long learning. |
| A6 | Provide a supportive environment for students with effective mechanisms for referral to specialist services when required. |

| | |
|---|---|
| A7 | Develop a broad understanding of biological science together with a more detailed and critical understanding of selected areas in biological science. |
| A8 | Develop in students a range of subject-specific and generic skills appropriate to employment both within and outside of biology. |
| A9 | Prepare students for postgraduate work and a professional career in Biological Science. |
| In addition the MBiolSci programme aims to: | |
| A10 | Develop in students an ability to carry out independent research, to critically review biological manuscripts and to write grant proposals. |

17. Programme learning outcomes

| Knowledge and understanding | | |
|---|--|------------------------|
| On successful completion of the programme, students will be able to demonstrate knowledge and understanding of: | | |
| | | Links to Aim(s) |
| K1 | A broad range of biological subjects of their choosing (including molecular and cell biology, molecular and cell biology biochemistry, genetics, evolution, microbiology, plant sciences, zoology, ecology and conservation, physiology and pharmacology, pathobiology, development and neuroscience). | A1-A9 |
| K2 | A number of specific subject areas in depth (from a choice of <i>inter alia</i> : biodiversity, animal behaviour, population and community ecology, organismal interactions, evolutionary genetics, climate science, biotechnology, pathobiology, environmental microbiology, regenerative medicine). | A1-A9 |
| K3 | The social, economic and global impact and utility of biological understanding in a choice of areas of interest (including <i>inter alia</i> biotechnology, agriculture and crop protection, climate change, sustainability, conservation and management, disease control, medical advances). | A1-A9 |
| K4 | Essential biological concepts and facts across a range of biological levels from sub-organismal organisation, through form and function, to interactions between individuals and within and between communities and ecosystems. | A1-A9 |
| K5 | The relationship between the information base in a subject area, the theory that arises from it and the genesis of empirical tests of the defining theory. | A1-A9 |
| K6 | Biostatistical techniques and their application. | A1-A9 |
| K7 | Biological terminology, nomenclature and classification. | A1-A9 |
| K8 | The ethical and philosophical issues related to biology and science. | A1-A9 |
| K9 | The applicability of biological skills and knowledge to careers. | A1-A9 |
| In addition MBiolSci Students will be able to demonstrate knowledge and understanding of: | | |
| K10 | Specialist research-led areas based in the School of Bioscience. | A1-A9 |
| K11 | Their responsibilities to communicate their science to the public. | A1-A9 |

| | | |
|--|--|-------|
| K12 | Advanced biostatistics. | A1-A9 |
| K13 | The processes underpinning the securing of funding and the publishing of biological research. | A1-A9 |
| K14 | The role of leadership in research. | A1-A9 |
| Skills and other attributes | | |
| On successful completion of the programme, students will be able to: | | |
| S1 | Recognise and apply biological theories, concepts, principles and/or paradigms to their work. | A1-A9 |
| S2 | Execute basic lab and field techniques in a safe, effective and precise manner. | A1-A9 |
| S3 | Carry out health and safety risk assessments and devise safe systems of working. | A1-A9 |
| S4 | Use first principles in biology and factual knowledge of systems to identify novel problems in biology. | A1-A9 |
| S5 | Use the scientific method to formulate hypotheses and testable predictions. | A1-A9 |
| S6 | Design observational and experimental studies that allow the testing of predictions. | A1-A9 |
| S7 | Collect, organise, analyse and interpret qualitative and quantitative empirical field and laboratory data to address biological questions. | A1-A9 |
| S8 | Use commercial software and programming systems for the management, analysis and presentation of data. | A1-A9 |
| S9 | Assess theories, concepts and empirical evidence from the biological literature and from observational and experimental studies in an objective and critical manner. | A1-A9 |
| S10 | Locate, critically evaluate, synthesise, summarise and cite printed and electronic information, including from the primary literature. | A1-A9 |
| S11 | Communicate effectively in writing and orally, identifying an appropriate method of communication depending on the material to be delivered and the audience. | A1-A9 |
| S12 | Produce a range of written materials (including <i>inter alia</i> scientific papers, literature reviews, essays, abstracts). | A1-A9 |
| S13 | Recognise the moral and ethical issues of a particular approach and appreciate the need for ethical standards and appropriate codes of conduct. | A1-A9 |
| S14 | Work effectively as part of a team, recognising and respecting the views and opinions of other team members, identifying collective goals and adjusting and applying appropriate approaches. | A1-A9 |
| S15 | Make informed / justifiable evidence-based decisions. | A1-A9 |
| S16 | Identify individual goals and responsibilities, exercise independent thought and judgement, act effectively, and reflect on ongoing individual performance | A1-A9 |

| | | |
|--|---|-------|
| S17 | Implement the skills underpinning life-long learning and employment (time-management, independent learning, organisational skills). | A1-A9 |
| S18 | Identify and work towards targets for personal, academic and career development using an adaptable, effective and resilient approach to study and work. | A1-A9 |
| In addition MBiolSci Students will be able to: | | |
| S19 | Organise and manage practical and literary research projects to a high standard. | A1-A9 |
| S20 | Write grant proposals for scientific research projects. | A1-A9 |
| S21 | Apply advanced, practical and statistical techniques to research. | A1-A9 |
| S22 | Communicate their science to a public audience via written and oral media. | A1-A9 |

18. Learning and teaching methods

In the earlier years, lectures are the principal means of imparting knowledge and understanding is gained through a combination of tutorials, example classes, laboratory classes and formatively assessed assignments. Skills are acquired mainly through self-directed, assessed work conducted during tutorials, laboratory classes, online data sessions, and group projects. In the later years, more emphasis is placed on student centred learning exercises, workshops, seminars and project work (small group and individual) as methods by which knowledge and understanding are gained and skills are acquired and improved. Field courses, with a strong emphasis on self-directed, autonomous use of acquired skills and the need to work efficiently in groups, develop field and transferable skills.

19. Assessment and feedback methods

Students' knowledge, understanding and skills are assessed by end-of-semester examinations, coursework and continuous assessment. Types of assessments are matched to each module's subject matter and learning objectives.

Lecture Modules:

Most lecture modules at levels 1 and 2 are assessed by formal examinations, which provide effective tests of knowledge, problem solving skills and conceptual and synthetic thinking. At Level 1, lecture modules are examined by multiple-choice papers. Level 2 lecture modules are primarily assessed using a combination of essay or short answer questions, or a combination of these and multiple-choice questions; some L2 modules involve coursework assessments. At level 3 lecture modules are assessed either by formal examination and/or coursework. Coursework may take the form of essays, problem-based questions or POST notes. Subjected to deadlines, these forms of assessment encourage students to manage their workloads, learning schedules and time productively. Most Level 2 and Level 3 examination papers offer a choice of questions and are designed to enable students to demonstrate their knowledge of the subject matter and concepts as well as to integrate specific aspects of their knowledge and skills base. There are no formal written examinations at Level 4 but there are formal data handling examinations, oral presentations and coursework.

Skills Modules

The skills modules at L1 and L2 are examined by continuous assessment throughout the year. Such assessment develops skills of self-motivation, organisation and self-discipline whilst indirectly stimulating the student's ability to harvest and collate information from the literature, whilst working to a deadline. Because a number of self-developed skills contribute to the standard of the assessed work, the assessment inevitably encapsulates these, as well as knowledge, logical and structured thinking and argument development. These assessments typically occur throughout the module and

involve feedback. Formats include written work, oral and poster presentations, laboratory notebook assessment and data handling and analysis exercises. Field courses at L2 and L3 are designed to develop student skills in a manner that prepares them for their project work and project assessment. To this end detailed formal feedback is given on field course assessments. Most data collection and processing skills are assessed via this form of assessment.

Assessments, both formative and summative, consider scientific content, logical structure, synthesis, level of critical evaluation, inclusion of literature, clarity of exposition, language and style. Selected modules at all levels have an element of formative assessment.

Projects and Dissertations

Level 1 and Level 2 practical projects and Level 3 and Level 4 research projects and dissertations are assessed on the basis of written reports in the style of formal scientific papers or reviews.

Feedback

Formative individual written and oral feedback will be provided in L1 and L2 tutorial exercises, and in L3 and L4 field course reports, dissertations and projects. Oral individual and group feedback will be provided in practicals and staff will be available in lecture modules for students to ask questions and receive feedback.

20. Programme structure and student development

The programme is modular and offered as full-time study only. Students gain subject knowledge and practical, communication and data skills. These are applied in later years in capstone research projects and literature reviews.

In Level 1 students are introduced to a broad range of biological theory, phenomenology, foundation practical skills and data collection methods that build on and consolidate skills and knowledge previously acquired. Tutorial work develops information processing and data interpretation skills and builds a solid base for conceptual thinking, logical argument, professional judgement, the development of communication skills, teamwork and skills for life-long learning. By the end of level 1 students will have an appreciation of the complexity and diversity of biological processes.

In Level 2 students develop a wider knowledge and deeper understanding of generic areas of biological science as well as subject areas that build on Level 1 experience. Core work includes practical skills that emphasise objective design and execution of empirical biological practical investigation. This is integrated with the development of a core statistical skill-base that informs design and enables analysis. The development of teamwork and interpersonal skills, time-management, conceptual thinking, logical argument and communication is developed in tutorials. Optional modules available at this level permit students to broaden and deepen their interests in more specialised areas of biology. Modules at this level employ a range of teaching and assessment techniques that are designed to foster and test the analytical and critical faculties of students and encourage autonomy in learning.

In Level 3 teaching and learning exploits the increasing sophistication our students are developing in their knowledge base and critical/analytical skills. The core modules are a research project and a literature review, both of which rely on, and further develop good transferable skills and a solid understanding of empirical biology/ information gathering, synthesis and critical evaluation. Students also choose from a wide range of optional modules in selected, research-led areas of biological science and field courses. These modules develop knowledge, understanding and a critical approach to evidence, theories and concepts and utilise a range of teaching and assessment methods appropriate to their learning aims.

Level 4 exploits and develops the self-confidence, knowledge base and capacity for autonomous study students have acquired during the preceding 3 years. During this year they acquire advanced subject-specific and generic transferable skills appropriate to employment within and outside of biology. The core modules in year four teach communicating science to the public, advanced biostatistics, and the processes underpinning successful fund-raising and publishing in biology.

Students also conduct laboratory and library research that requires the application of technical and conceptual knowledge and understanding gained in the earlier years. Students work in active research groups and are expected to learn from, and contribute to, those groups, displaying appropriate levels of creativity, originality and judgement.

Detailed information about the structure of programmes, regulations concerning assessment and progression and descriptions of individual modules are published in the University Calendar available online at <http://www.sheffield.ac.uk/calendar/>.

21. Criteria for admission to the programme

BSc - AAB including Biology and a second science.

MBiolSci - AAA including Biology and a second science.

Information obtained from <http://www.shef.ac.uk/courses/>.

22. Reference points

The learning outcomes have been developed to reflect the following points of reference:

Subject Benchmark Statements

<https://www.qaa.ac.uk/quality-code/subject-benchmark-statements>

Framework for Higher Education Qualifications (2014)

<https://www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf>

University Vision and Strategic Plan

<https://www.sheffield.ac.uk/vision>

23. Additional information

Teaching facilities include modern teaching laboratories, lecture theatres and excellent IT systems. The departments are within walking distance of a vibrant 24-hour city centre and also within easy reach of the Peak District National Park, an area of outstanding natural beauty.

This specification represents a concise statement about the main features of the programme and should be considered alongside other sources of information provided by the teaching department(s) and the University. In addition to programme specific information, further information about studying at The University of Sheffield can be accessed via our Student Services web site at <http://www.shef.ac.uk/ssid>.