



Subject Benchmark Statement

Biosciences

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SO S! UK

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About this Statement

This document is a QAA Subject Benchmark Statement for Biosciences that defines what can be expected of a graduate in the subject, in terms of what they might know, do and understand at the end of their studies. Subject Benchmark Statements are an established part of the quality assurance arrangements in UK higher education, but not a regulatory requirement. They are sector-owned reference points, developed and written by academics on behalf of their subject. Subject Benchmark Statements also describe the nature and characteristics of awards in a particular subject or area. Subject Benchmark Statements are published in QAA's capacity as an expert quality body on behalf of the higher education sector. A summary of the Statement is also available on the QAA website.

Key changes from the previous Subject Benchmark Statement include:

- a revised structure for the Statement, which includes the introduction of cross-cutting themes of:
 - equality, diversity, and inclusion
 - accessibility and the needs of disabled students
 - education for sustainable development
 - employability, entrepreneurship and enterprise education
- a comprehensive review updating the context and purposes, including course design and content in order to inform and underpin the revised Benchmark Standards.

How can I use this document?

Subject Benchmark Statements are not intended to prescribe any particular approaches to teaching, learning or assessment. Rather, they provide a framework, agreed by the subject community, that forms the basis on which those responsible for curriculum design, approval and update can reflect upon a course, and its component modules. This allows for flexibility and innovation in course design while providing a broadly accepted external reference point for that discipline.

They may also be used as a reference point by external examiners in considering whether the design of a course and the threshold standards of achievement are comparable with those of other higher education providers. They also support

professional, statutory and regulatory bodies (PSRBs) with the academic standards expected of students.

You may want to read this document if you are:

- involved in the design, delivery and review of courses in Biosciences
- a prospective student thinking about undertaking a course in Biosciences
- an employer, to find out about the knowledge and skills generally expected of Biosciences graduates.

Relationship to legislation

The responsibility for academic standards lies with the higher education provider which awards the degree. Higher education providers are responsible for meeting the requirements of legislation and any other regulatory requirements placed upon them by their relevant funding and regulatory bodies. This Statement does not interpret legislation, nor does it incorporate statutory or regulatory requirements.

The regulatory status of the Statement will differ depending on the educational jurisdictions of the UK. In England, Subject Benchmark Statements are not sector-recognised standards as set out under the Office for Students' [regulatory framework](#). However, they are specified as a key reference point, as appropriate, for academic standards in Wales under the [Quality Assessment Framework for Wales](#) and in Scotland as part of the [Quality Enhancement Framework](#). Subject Benchmark Statements are part of the current quality arrangements in Northern Ireland. Because the Statement describes outcomes and attributes expected at the threshold standard of achievement in a UK-wide context, many higher education providers will use them as an enhancement tool for course design and approval, and for subsequent monitoring and review, in addition to helping demonstrate the security of academic standards.

Additional sector reference points

Higher education providers are likely to consider other reference points in addition to this Statement in designing, delivering and reviewing courses. These may include requirements set out by PSRBs and industry or employer expectations. QAA has also published [Advice and Guidance](#) to support the [Quality Code](#), which will be helpful when using this Statement - for example, in [course design](#), [learning and teaching](#), [external expertise](#) and [monitoring and evaluation](#).

Explanations of unfamiliar terms used in this Subject Benchmark Statement can be found in [QAA's Glossary](#). Sources of information about other requirements and examples of guidance and good practice are signposted within the Statement where appropriate.

1 Context and purposes of a Biosciences degree

1.1 Biosciences is the study of life, and, as such, lies at the heart of human endeavour. An understanding of what ‘life’ is remains central to so many of the great questions that humans ask about the world and ourselves, **especially in the context of environmental challenges, such as sustainability**. The subject area of Biosciences now encompasses such a breadth and depth of knowledge and skills that it would be impossible to cover the whole subject in a lifetime of study. Biosciences continues to expand more rapidly than ever before, in a multitude of directions. To meet the challenges of such a large and rapidly expanding subject area, Biosciences degrees need to be able to produce graduates who have the knowledge and skills appropriate to current specialisms within the discipline, but to also have the **resilience, breadth of knowledge, and understanding to adapt** to an ever-changing subject.

Purposes and characteristics of a Biosciences degree

1.2 Biosciences graduates make a significant contribution to a very wide range of sectors. These include industry, government, non-governmental organisations (NGOs) and education. While Biosciences degrees will equip graduates to be able to pursue a research career, it is increasingly important to recognise the contribution that Biosciences graduates make in other areas, **including those that directly contribute to global, social, health and environmental challenges**, and to prepare graduates accordingly. The majority of Biosciences graduates will use their knowledge and skills in careers outside of research.

1.3 Biosciences graduates should gain **multi and interdisciplinary** knowledge, practical and transferable skills and behaviours required for them to **take affirmative action and make a positive contribution to society and the environment**. Biosciences graduates should be able to link and **critically apply** their biological knowledge to **real-world issues and challenges, like those of climate change and conservation**, and be prepared to succeed in a range of biological and non-biological careers.

1.4 Biosciences graduates should gain a foundation of knowledge and understanding in a wide range of **dynamic** processes and concepts across the

biological kingdoms, from the fundamental molecular basis of life to an appreciation of systems biology, whole ecosystems research, **and the ways in which change will impact every level of these systems.**

1.5 The great diversity within the Biosciences makes it impossible to gain a detailed understanding of the entire subject area. While Biosciences graduates should have a broad understanding across the subject, they will usually specialise and develop a depth of understanding in a smaller number of sub-disciplines. This specialist knowledge and skills base will differentiate graduates in different sub-disciplines of the biosciences, **such as ecology, or environmental biology**, which may be indicated with a more specific degree title.

1.6 Reflecting the breadth **and interconnected nature** of the discipline, Biosciences degrees **should be multi and interdisciplinary**, to include contributions from other disciplines. As such, Biosciences course designers may also need to refer to other Subject Benchmark Statements **for "hard" sciences, "soft" sciences, and non-scientific subjects**, including, but not limited to, [Biomedical Sciences](#), [Chemistry](#), [Geography](#) and [ES3 \(Earth Sciences, Environmental Sciences and Environmental Studies\)](#), to inform curricula. The emphasis should be on how other disciplines can make valuable contributions to the study of living systems.

1.7 Biosciences degrees are designed to equip students with the knowledge and understanding to promote sustainability within their chosen lines of study, allowing them to explore, analyse and critically evaluate the opportunities for developing sustainable practice within their own subject areas, reflecting on the [United Nations' Sustainable Development Goals \(SDGs\) 2030 and 2050 Targets](#). **This includes understanding the multivariate and interconnected nature of biosciences and their impact on global systems.**

1.8 Biosciences degrees will provide students with opportunities to **investigate, review and apply sustainable strategies** based on a sound in-depth review of present **and emerging** sustainability ideas, including available technology, economic viability and subject-specific scientific robustness. **By using a systems-thinking framework**, there is an opportunity to **reinforce the importance of sustainability** but also to frame it in terms of the importance of the subject area, in terms of producing **present and future sustainable ecosystems** and a sustainable human population within these systems. **Students will be encouraged to adopt a multidisciplinary approach, recognising the interconnectedness of biological, environmental, economic, and social factors in sustainability.**

1.9 Biosciences graduates should gain practical skills, which may be developed in laboratory, field and/or computational contexts. Practical work should be inclusive, **accessible, and flexible**, and all students should be provided with high-quality skills training in appropriate formats that can accommodate individual needs. **Practical skills development should be enquiry-driven** where possible, with students exposed to the authentic research process throughout their degree. Students undertaking final-year capstone projects should have significant opportunity to develop practical and research skills before this point. Final-year projects should not be the only area in which these skills are developed.

1.10 Biosciences degrees can be structured so that all students have equivalent opportunity to succeed. Biosciences graduates should also understand the importance of **equality, diversity, inclusion, intersectionality, and decolonisation** in both disciplinary and societal contexts, including how historical events have shaped disciplinary thinking and cultures, **and how their actions within the discipline will impact different communities. Flexibility in course design can help address diverse student needs and promote a more inclusive learning environment.**

1.11 Graduates in Biosciences need to be aware of the importance of communicating scientific information to a wide range of audiences and in a variety of formats, and students can have opportunities to develop relevant communication skills. **This includes understanding the role of scientific communication in shaping local and global communities and addressing diverse stakeholder perspectives.** Graduates should be able to gather and evaluate information in order to synthesise ideas and key messages, including effectively communicating uncertainty.

1.12 Assessment of students in Biosciences needs to be fair, authentic and valid. Assessments should be designed to test **application of knowledge and skills, including transferable skills.** Inclusivity, **accessibility, and flexibility** should be considered at all stages of assessment design and implementation.

Equality, diversity and inclusion

1.13 This Subject Benchmark Statement addresses issues of inclusion throughout, and advocates intentional support for diverse student cohorts, acknowledging that equality and diversity are interdependent. **Promoting equity of opportunity for all is underpinned by valuing and harnessing differences, treating everyone with dignity and respect, supporting aspirations and enabling**

people with diverse abilities, identities and backgrounds to succeed. Biosciences courses should be designed to create an environment that encourages openness and participation, where everyone feels respected, supported and valued and understands their own personal responsibility for equality and inclusive practice. **This includes fostering a critically informed understanding of how historical and systemic factors impact contemporary issues in Biosciences, ensuring that education is both inclusive and representative of diverse perspectives.** An inclusive environment for learning anticipates and accommodates the varied requirements of students and ensures equitable access to educational opportunities **and provider or course related career opportunities.** Biosciences courses should proactively raise awareness of equality, equity, diversity, **inclusivity, intersectionality, and decolonisation** through integrated activities and discussions and should be regularly reviewed and updated in line with institutional and government guidance. Course providers, staff and students all have a role in, and responsibility for, promoting equality and diversity and challenging biases and stereotypes.

1.14 Biosciences is a subject underpinned by objective observation. It is important, however, to recognise and proactively discuss and confront the historical factors that have influenced the biological sciences. **Courses should critically engage with how the subject has contributed to and benefited from social injustice, for example presenting a balanced and informed history of the field and acknowledging that influential scientists might have benefited from and perpetuated misogyny, racism, homophobia, ableism and other prejudices. By exploring intersectionality,** students will be encouraged to consider that individual biases, culture and society as a whole influence the biological sciences, including what science is done, what is considered ethical, who does that science, how **representative** data is **collected and** interpreted, and how biological knowledge is used. **This should include critical examination of current as well as past practice and incorporation of a diverse range of underrepresented sources, including work from scientists from marginalised communities and references, case studies and learning materials representing the full range of human diversity.** Consideration should be given to whether teaching materials and subject matter covered might inadvertently perpetuate biases and stereotypes, **and students should be encouraged to adopt a critical approach in understanding the nature of these influences on the discipline and their own thought processes.**

1.15 Curricula should recognise the discoveries and contributions of biological scientists with diverse backgrounds and identities and acknowledge that different

cultural backgrounds provide different insights and lead to new discoveries. Curricula should also recognise, and teaching should instil within students, that alternative knowledge sources and recordings, such as personal experience, oral histories, and Indigenous Knowledge, can be equally as important and valid as the strict scientific method and should not be discounted without rigorous testing to disprove it. Furthermore, students should have the opportunity to explore Biosciences topics that inspire them and that allow them to situate their knowledge in the light of their lived experiences or cultural backgrounds. Students should be encouraged to evaluate both the positive and negative impacts of potential applications of biological discoveries and reflect on the ways in which knowledge of Biosciences might be exploited for political, commercial or capital ends in ways that further exacerbate inequality, including understanding the impacts of scientific progress on social justice. Curricula should facilitate the development of culturally aware graduates, with ethical and open approaches to thinking and practising the Biosciences that emphasise the interconnected nature of biological systems and societal structures.

Accessibility

1.16 Equity involves enabling access to the course of study for people who have differing individual requirements and eliminating arbitrary and unnecessary barriers to successful learning. This requires a commitment to intersectionality and decolonisation, ensuring that all perspectives are represented and valued. Equity of access should be considered in accordance with, but not limited to, the requirements set out in the Equality Act 2010, and should encompass both physical and digital resources, teaching styles, learning spaces, and learning support provision. Entry to Biosciences courses should be equitable and selection should be based on an individual's potential to complete the course. Biosciences course teams must ensure that all students are offered learning and assessment opportunities that are equally accessible to them, using inclusive design wherever possible, and by means of reasonable individual adjustments where necessary. Learning and assessment experiences should be diverse, reflecting the varied nature of the subject and increasing accessibility for all students. Biosciences course teams should provide opportunities for applicants to engage with disability and other learning support teams to discuss reasonable adjustments from the outset, with respect to teaching, assessment and practical work. This should include opportunities for students to provide appropriate evidence of their disability or other relevant personal circumstances such as work and care responsibilities, and the provision of guidance on the type of evidence required to

allow consideration of adjustments to education and assessment activities. Furthermore, curricula should be flexible and adaptive, ensuring that diverse learning styles and needs are accommodated, fostering an inclusive and supportive educational environment.

1.17 Biosciences course teams must ensure that curricula, pedagogy, assessments and practical elements of courses are designed to be fully **inclusive**, accessible and flexible. **Equitable access to the course for all students should be proactively and flexibly considered, including fieldwork, laboratory work and placements, both at home and abroad.** Further adjustments should be offered on an individual basis where required. **Social capital, culture, sexuality, disability, neurodivergence and other characteristics should not prevent students from having equitable access to the entire curriculum.** Teams should engage with, and respond to, feedback from a variety of sources, **including current students**, to improve the course and remove barriers to learning.

Education for Sustainable Development

1.18 Sustainability and sustainable development are key considerations in Biosciences: they are vital to managing Earth's resources to promote the long-term well-being of the planet and all its inhabitants. It is important to note that sustainability is not solely about the environment. **It is an ongoing process of addressing societal, environmental and economic concerns to create a better world, and, as such, has particular relevance to Biosciences.** Practical considerations might include reducing paper use, engaging with various professional recognition schemes, and **integrating into teaching the discussion of the ethics and environmental impact of laboratory work (for example, replacing chemicals with sustainable alternatives, if possible, and considering glassware in place of disposable plastic), and fieldwork (for example, offering virtual opportunities and considering factors involved with international travel, including carbon footprint and promoting ethical travel).** **Students should then be encouraged to follow the waste-reduction methods and ethical practices which result from these discussions throughout their studies and working lives within or outside of the Biosciences. Curricula should also incorporate decolonisation and inclusivity to ensure diverse perspectives are represented in sustainability discussions.** An awareness of waste reduction, bioremediation, careful use of all non-renewable resources, alternative energy sources and pollution control can be explored in the curriculum. In Biosciences, it is also particularly important to consider living plant and animal resources. For example, collection of samples can

endanger threatened species and the use of animals in any manner is a major ethical concern. Relevant legislation should be upheld, for example the Animals (Scientific Procedures) Act welfare standards, and courses should make every effort to adhere to the principles of replacement, reduction and refinement with respect to animal use. **Furthermore, the curriculum should encourage students to critically evaluate the impact of biosciences practices on both local and global communities, fostering a deeper understanding of the interconnectedness of all life systems.**

1.19 The application of sustainable development in the higher education sector takes place through education for sustainable development (ESD), which is the process of creating curriculum structures and subject-relevant content to support and enact sustainable development. As defined by UNESCO in 2019, 'ESD is holistic and transformational education which addresses learning content and outcomes, pedagogy and the learning environment. It achieves its purpose by transforming society'. An understanding of the United Nations' [Sustainable Development Goals \(SDGs\)](#) is essential to this vision and **the SDGs should be integrated holistically and critically across the curriculum.**

1.20 To support the inclusion of sustainable development within Biosciences, users should refer to the [QAA and Advance HE Education for Sustainable Development Guidance](#) to address teaching and learning for sustainable development, key competencies, learning outcomes and assessment within the curricula. Working with student representatives, higher education providers and sustainability teams might be an effective approach to facilitate curriculum structures to support ESD.

Employability, enterprise and entrepreneurship

1.21 Employability is a set of competencies, demonstrated by combined knowledge, skills and behaviours that make individuals more likely to gain employment and be successful in their chosen occupations, benefiting themselves, society and the economy. It includes **systems thinking**, problem identification and solving, innovation, creativity, communication and practical action. Entrepreneurship enhances employability by promoting personal development. It fosters those attributes that enable students to transition into successful graduates, actively participating in society and identifying opportunities to develop a meaningful career combined with the creation of cultural, social, **environmental** and economic value. **Incorporating themes of sustainability and ethical practice further enhances these attributes, ensuring graduates can**

navigate and contribute to a rapidly changing world. These attributes are integral in Biosciences, although the emphasis may differ between courses.

1.22 Developing close links with employers and involving them in curriculum and assessment design will positively enhance graduate employability. Employability and entrepreneurship focus on competencies (knowledge, skills and behaviours) plus transferable themes such as business awareness, professional ethics, health and safety and personal motivation. **Exploring the interconnected nature of these competencies helps students understand the broader impact of their work and prepares them for diverse career paths.** Enterprise and entrepreneurship education should be co-created with multiple stakeholders, for example employers, professional bodies, service users, and may cover a range of topics, such as project planning and management, financial, environmental or personal sustainability, innovation, intellectual property and commercialisation. Ideally, these topics may be explored through subject-specific applications based on real-world examples.

1.23 Alumni, entrepreneurs and other relevant specialists, for example practitioners, may be invited to contribute to courses and the development of tasks and assessments that are authentic and support learning through self-reflection. Collaborative work by students during their courses should promote teamworking, negotiation and leadership skills, **developing and upholding personal values, and a critical understanding of their individual role within a team.** Students should take responsibility for their own personal and professional development, demonstrating a commitment to learning, self-improvement and supporting the development of others, as appropriate.

1.24 More information can be found in the QAA document [Enterprise and Entrepreneurship Education: Guidance for UK Higher Education Providers](#).

2 Distinctive features of a Biosciences degree

Design

2.1 The Biosciences cover a broad, fast-evolving discipline area, pivotal for advancing our understanding of life on Earth. Application of knowledge from the Biosciences is often at the forefront in addressing global societal challenges, **including sustainability and environmental resilience.**

2.2 The breadth of twenty-first century Biosciences encompasses:

- the chemical processes that occur inside cells, and their regulation
- concepts and application of the theory of evolution across all kingdoms of life
- whole organism physiology, anatomy, health and ageing
- intra and interspecific interactions, behaviour, population biology and dynamics
- complex community ecology, often in environments shaped by anthropogenic inputs, ecosystem degradation and conservation, **highlighting the marked degradation and change in ecosystems since the industrial revolution**
- application of agricultural, industrial or medical biotechnologies, including in the discovery of disease intervention, the **development of low-carbon technologies, bioremediation or innovation to protect food and water security.**

2.3 The full scope of the Biosciences (indicated in paragraph 2.2) is huge, and single courses will not attempt to cover this vast area in detail. There are therefore a wide range of possible paths included within the scope of Biosciences and it is not necessary for a Biosciences degree to reach across all sub-disciplines of the subject. **This allows for flexible and specialised curricula that can adapt to the dynamic nature of the field and the diverse interests of students.**

2.4 Honours degree courses in Biosciences are designed to provide graduates with a broad understanding of the scientific basis of the study of living systems and controlled experimental design and execution. They also provide skills, behaviours and qualities necessary for progression into highly skilled employment or further study, including professionalism, **personal responsibility, accountability**

and independent thought and decision-making where situations are complex or ambiguous and outcomes may be difficult to predict. Taught and research-based postgraduate degrees, certificates or diplomas offer opportunities to further specialise in specific areas of the Biosciences.

2.5 Biosciences degrees are often interdisciplinary in scope to reflect the interconnected nature of biological, environmental, and social processes, and some courses will overlap with other subject areas. Where this is the case, other relevant Subject Benchmark Statements may be consulted. For example, certain courses might reach into Biomedical Science; for Biochemistry courses there will be overlap into Chemistry; for courses addressing ecology, the environment and/or conservation, overlap with Geography or ES3 (Earth Sciences, Environmental Sciences and Environmental Studies), Marine Sciences or Analytical Chemistry might be likely. In an era where large data-sets are often relevant to highly skilled employment or research in the Biosciences, courses might overlap with Data Analytics or Information Technology.

2.6 Biosciences curricula should integrate themes of the Anthropocene, recognizing the significant human impact on the Earth's spheres and ecosystems. Students should be encouraged to think analytically and critically about resource-based versus ecosystem-based approaches to solving environmental issues, maintaining viable planetary solutions, and making informed decisions. This includes understanding the limitations of current practices and technologies and exploring innovative, sustainable alternatives. Emphasising the interdependent nature of the biosphere, including the role of humans, will prepare graduates to contribute effectively to addressing global challenges and advancing sustainability.

2.7 Course design typically includes experimental as well as theoretical components. For many courses regional, residential or international field work is also often a distinctive feature, providing training in ecology and conservation. However, advances in computational Biosciences and simulation-dependent learning mean there is much scope for innovation in Biosciences course design and opportunity to move away from traditional laboratory and field-based models of teaching delivery. Designs that move away from traditional models of delivery provide sustainable, inclusive environments for disabled students or may be readily adaptable for distance, transnational, or micro-credential learning.

2.8 In addition to discipline-specific content, undergraduate or postgraduate courses in the Biosciences can incorporate elements that readily develop a

student's transferable skills in preparation for progression into the workplace. This might include, for example, developing fluency in relevant coding languages, or awareness of biosciences-led 'real-world' policy development. It will also include more broadly applicable skills, including communication, data analysis, teamwork, leadership, **value identification** and problem-solving. In this way, students are provided with the best opportunity to position themselves well for employment within or outside of the Biosciences, **ensuring they are equipped to contribute to both local and global communities in a holistic and sustainable manner.**

2.9 Students completing Biosciences degrees may pursue a wide range of graduate roles, both within and outside the subject. Major employment areas in the labour market for graduates with a Biosciences training include, but are not limited to:

- pharmaceutical, agricultural, veterinary, biotechnology or healthcare industries
- diagnostics laboratories
- environmental and conservation sector
- education: university, college and school teaching or public engagements
- government departments and the civil service
- NGOs
- corporate sector
- journalism or other science communication
- legal and intellectual property
- food industry and food security
- clinical trials or other healthcare regulatory matters
- medical or scientific writing.

Progression

2.10 Over the course of a degree with honours (FHEQ Level 6; FQHEIS Level 10) a Biosciences student will progress from one level of study to the next, in line with the regulations and processes for each institution and having achieved the appropriate course-level learning outcomes each year. Each level would see the attainment of knowledge, skills and experience that build towards the final achievement of meeting the overall course learning outcomes and threshold-level subject-specific and transferable skills listed in this Statement. This would include successful completion and the award of credit for the full range of learning and assessment, including practicals and field courses where appropriate.

2.11 Progression should recognise the diversity of prior experience and the challenges of transition, allowing all students to aim to achieve their ambitions, irrespective of their background. **This includes promoting inclusive and decolonised approaches to education.** Support should be provided for academic and personal development as well as for learning course content.

2.12 Students are normally offered an opportunity to be reassessed in any failed modules, particularly where failure either prevents progression or qualification for an award.

2.13 In a standard three-year undergraduate honours degree course, students may exit earlier and be eligible for a Certificate of Higher Education, a Diploma of Higher Education, or an Ordinary or Pass degree, depending on the amount and type of credit successfully completed. In Scotland, bachelor's degrees with honours are typically designed to include four years of study, which relates to the structure of Scottish primary and secondary education. For students following part-time routes, their study time would be the equivalent of the three or four-year degree.

2.14 Undergraduates studying a combined, joint or major-minor route will achieve core elements of the subject-specific and generic skills for the subject, and will add others according to the subjects covered in joint courses. Additionally, they may explore the overlap between their two subject areas, creating further opportunities for interdisciplinary study. **This approach encourages students to develop a holistic understanding of the interconnected nature of biosciences and other disciplines, fostering a comprehensive and flexible skill set.**

2.15 Integrated master's degrees (FHEQ Level 7; FQHEIS Level 11) are available in Biosciences in the UK and comprise a four-year full-time course (five-year full-time course in Scotland). In this extra academic year of study, it is expected that students are able to demonstrate increased critical thinking, evaluation and research skills and independence. Integrated master's degrees typically also offer a bachelor's degree with honours as an exit award for those who have attained sufficient credit, but are not able, or do not wish, to complete the course onto which they originally enrolled.

2.16 Students undertaking Degree Apprenticeships at Level 6 or 7 will be subject to the normal rules for progression and award of the degree, but will be required to pass the end-point assessment in order to be awarded the apprenticeship.

2.17 Upon graduation from an undergraduate degree, a student who has achieved a second-class degree or higher would be capable of, and equipped for, undertaking postgraduate study in Biosciences or an associated discipline. Entry requirements to postgraduate courses are, however, determined by individual providers and may require specified levels of achievement at undergraduate level **but should still aim to be flexible in their entry requirements, accounting for individuals' experience outside just the traditional academic backgrounds.**

2.18 Standalone master's degree (MSc and MRes) courses in Biosciences are self-contained courses, normally involving one or two years of postgraduate study in a specialist area.

Flexibility

2.19 Biosciences courses are dynamic, flexible and agile, allowing programme teams to meet the needs of the individual student **and** workforce and to respond to local, national and global trends and innovations. Flexibility is embedded in a variety of ways, including the length of courses, the type of engagement, and what and how students study. Undergraduate and postgraduate students may elect to study their course full-time, or study part-time where offered. This flexibility in duration can be for the entire programme, or a fixed period of study depending on a student's circumstances. Though this flexibility can be supportive of students with additional responsibilities, such as caring or employment, challenges can be encountered with course changes and cohort engagement. **Courses should be designed to address these challenges by maintaining inclusive and equitable access for all students, regardless of their background or personal commitments.** Furthermore, the duration of courses may vary if they include a foundation year, or an industrial or study abroad placement.

2.20 Students may engage in their studies in several ways. Most courses are full-time and campus-based, where learning takes place as lectures, practical laboratory, field and ICT classes, seminars, workshops and tutorials. These may be delivered using blended and technology-enhanced learning activities, embedding online, and flipped, active learning to support and enhance classroom-based learning **while utilising procedures which remain inclusive of and accessible to the needs of all learners.**

2.21 Distance learning tends to offer a mixture of synchronous and asynchronous learning activities. Students can study remotely full-time or part-time at both undergraduate and postgraduate levels. Due to their flexible access,

distance learning courses reduce the barriers to higher education and provide an inclusive, accessible, sustainable and global mode of study. **This mode of learning aligns with principles of education for sustainable development, promoting lifelong learning and the ability to adapt to evolving global challenges.**

2.22 Students may also engage in smaller, more bite-sized learning and undertake micro-credentials. Micro-credentials are credit-bearing against a recognised level of the Qualifications Framework that are subject to standard quality assurance mechanisms, but do not carry an award, such as a Postgraduate Diploma (PGDip), in their own right. Within Biosciences, micro-credentials are often aimed at professional students wishing to upskill in a specific area and therefore they deliver industry-focused skills and knowledge that support enhancing the workforce. Providers may offer the opportunity to transfer micro-credential credits or stack them to eventually gain a full qualification. Micro-credentials also offer the opportunity to reskill within the Biosciences field and can promote career migration and lifelong learning. More information can be found in the [QAA Characteristics Statement for Micro-credentials](#).

2.23 The dynamism of the Biosciences discipline promotes and sustains diverse curricula. Courses need to be adaptable to respond to, and anticipate, advances in the subject, other disciplines and the needs of its graduates and employers. Providers may offer students the possibility to study a general Biosciences course or specialise within a particular interest. These may be level dependent, and some modules may require pre or co-requisites. Due to the multi and interdisciplinary nature of Biosciences, many providers will offer joint-honours courses that can include Biosciences with, for example, Geography, Sustainable Development, Psychology, Mathematics or Chemistry. There may also be the opportunity to study extra credits or additional modules in different subject areas.

2.24 The diversity of subjects studied within Biosciences lends itself to multiple, variable and extensive learning, teaching and assessment methods. The variety of delivery modes engages and supports diverse learning communities. These highly enriched learning and assessment methods allow greater inclusivity as choice of delivery and assessment can be reasonably adjusted to suit an extensive range of students' needs.

Partnership

2.25 Biosciences, by its very nature of being complex, multi and interdisciplinary, is highly collaborative. Many aspects of a Biosciences curriculum

may involve partnership and the types and extent of the collaborations are as diverse as the subject itself. Partnerships differ at different levels and types of study, but generally entail collaboration with students and/or courses in further education, higher education, international partners, **the local community, employers and professional or learned societies which share or reflect similar values including sustainability, equity, and inclusivity as the course provider.**

2.26 Courses may be run in collaboration with further education providers, particularly in the development and delivery of foundation years or in some cases within Biomedical Sciences and Degree Apprenticeships. These collaborations will consist of a clear programme of learning, with agreed learning outcomes, delivery modes and responsibilities and quality assurance processes.

2.27 Programmes and students can also collaborate with other higher education institutions (HEIs) on shared modules, where students unite to work together and study a common module or course. This may facilitate development of teamwork, negotiation and leadership. Students may be able to spend a semester in a different institution, or undertake study placements, such as a year in research, in other HEIs. Likewise, many courses will collaborate with international HEIs to offer semester and year abroad placements. Students may also be able to undertake their capstone research project elsewhere, as part of these home and international HEI collaborations. Local and international field courses may also be run in collaboration with other HEIs and/or other organisations. All of these shared opportunities can give students additional opportunities to experience different laboratories or natural environments, experience a more complex range of technology and skills development, **learn to work with and begin to understand a more diverse range of individuals and groups** and broaden their understanding of different applied techniques. Students also develop highly employable interpersonal skills and gain a greater experience of global citizenship.

2.28 Partnerships between the course and local community can improve relationships between the student and local communities, increase the positive impacts a HEI has on the local area economically, socially, culturally and environmentally, and develop more positive attitudes towards the HEI among the local community. Biosciences can contribute to such partnerships by linking course content to local issues and including local examples alongside global examples. Course teams can encourage and facilitate students to focus research or experimental projects on benefitting the local community, both in teaching modules and extracurricular or career related activities. As well as placing

students and their learning within the local community, the local community can be invited into a HEI's space, research and development through the quadruple helix model. This may entail, but is not limited to, utilising or creating a local Living Lab to put the user (local community) at the heart of developing products and processes; working with local primary, secondary and tertiary education providers to inspire younger students, enrich their learning, and expose them to areas of Biosciences, technology, and learning opportunities they may not otherwise receive; inviting local community members and business owners to share feedback on how they would like to benefit from the HEI's presence and work; and ensuring members of marginalised communities have equitable access to taking part in these community centred initiatives.

2.29 Enhancing student employability is a fundamental outcome for Biosciences courses. Therefore, engagement with the relevant employment sectors should be extensive. Biosciences courses should have a clear work-integrated learning strategy where students have the opportunity to develop employment-focused skills and engage with employers. Within the framework, courses may include modular-based work-simulated learning, where students are provided with the opportunity to experience, practice and develop relevant technical skills. These should be informed by sector norms, current techniques and predicted advances within the discipline and offer an inclusive and accessible experience for all students on the course. Students may engage with employers through paid and/or unpaid placements of various durations during which students will be fully immersed in the workplace and experience the day-to-day routine of employment. Funding or payment should be **encouraged** to ensure that placement opportunities are inclusive and accessible to all.

2.30 Undergraduate and postgraduate taught students may also collaborate with an industrial partner for their capstone research project experience where they undertake focused research that addresses the needs of the employer and has real-world applications. Industrial and business collaborations may also be utilised for partnership delivery of Degree Apprenticeships. Most courses should offer careers fairs where students can meet employers and learn about the types of employment available and skills required. Applied areas of the Biosciences may also liaise with employers to form an industry steering group to inform and influence curriculum and pedagogic design. Each of these learning opportunities promotes professional skills development, entrepreneurship, encourages students to learn about how to organise and manage business risk and profit as an outcome, and can allow graduates to create a unique career profile.

2.31 Student societies provide excellent opportunities for students to collaborate with their peers both socially and professionally. Societies contribute to a vibrant learning their peers both socially and professionally. Societies contribute to a vibrant learning community and range in their engagement activities from working within the university to local communities and professional bodies. Students can also engage with relevant national or international learned societies. Benefits of engagement include access to publications, training events, careers information, grants and networking opportunities.

2.32 Students should expect to be embraced as partners within their own courses. To reflect the diverse needs and perspectives of the student body, the student voice should play a significant role in course development, delivery, review, partnerships and the overall student experience within Biosciences. Students are able to provide guidance, feedback and support for their own learning in several ways; this can be through departmental representatives or student surveys such as the National Student Survey (NSS) or SDG and sustainability curriculum mapping. Furthermore, students can feed into, and collaborate with, their students' union, and many universities offer public social media platforms to receive feedback from students and discuss current trends in the student experience. Involving students in quality review processes can foster a sense of ownership and accountability, ensuring that the curriculum evolves to meet contemporary challenges, including those related to sustainability and equity. Students involved in quality review processes can be invaluable during the curriculum review and development of new courses where student steering groups may be established.

Monitoring and review

2.33 Degree-awarding bodies and their collaborative partnerships routinely collect and analyse information and undertake periodic course review according to their own needs. They draw on a range of external reference points, including this Statement, to ensure that their provision aligns with sector norms, aims and considerations for the future. Monitoring and evaluation are a periodic assessment of a course, conducted internally or by external independent evaluators. Evaluation uses information from both current and historic monitoring to develop an understanding of student achievement or inform future course planning.

2.34 Monitoring and review should include feedback from current students, external stakeholders, such as employers and placement providers, and alumni, to

influence curriculum design, content and delivery. There should also be feedback from employers and apprentices for Degree Apprenticeships.

2.35 A review ensures the embedding of Education for Sustainable Development (ESD) and equality, diversity and inclusion (EDI) throughout the entire curriculum. **Implementing a holistic approach to a review promotes the creation of curricula that not only address academic and professional competencies but also foster ethical and sustainable practices within the Biosciences.**

2.36 Evaluation of student performance data and various measures of the student experience should be integrated with expert review, including that provided by external Examiners, **and specific reviews of students and performance of marginalised groups to ensure the provider provides sufficient support to allow them to succeed and flourish during their education under the provider.**

2.37 Externality is an essential component of the quality assurance system in the UK, **helping ensure that curricula remain flexible and adaptive to global trends and innovations in the Biosciences.** Higher education providers will use external reviewers as part of periodic review to gain an external perspective on any proposed changes and ensure threshold standards are achieved and content is appropriate for the subject.

2.38 The external examination system currently in use across the UK higher education sector also helps to ensure consistency in the way academic standards are secured by degree-awarding bodies. Typically, external examiners will be asked to comment on the types, principles and purposes of assessments being offered to students. They will consider the types of modules on offer to students, the outcomes of each cohort and how these compare to similar provision offered by other UK higher education providers. External examiners are asked to produce a report each year and make recommendations for changes to modules and assessments (where appropriate). Subject Benchmark Statements, such as this one, can play an important role in supporting external examiners in advising on whether threshold standards are being met in a specific subject area.

2.39 Currently, a major accreditor of Biosciences courses is the Royal Society of Biology who accredit a diverse range of courses. Other accrediting bodies, such as the Chartered Institute of Ecology and Environmental Management and the Committee of Heads of Environmental Science, also accredit courses at

undergraduate or postgraduate taught level. These accreditations are usually conducted through a combination of site visits and desk-based reviews.

3 Content, structure and delivery

Content

3.1 Each higher education provider awarding qualifications in Biosciences defines the content, nature and organisation of its courses and modules. Consequently, Biosciences courses offered by individual providers will have their own distinctive characteristics, both in terms of subject-specific content and in underpinning and enabling knowledge and skills. This rich diversity of curricula provides students with an abundant choice of courses and modules.

3.2 Biosciences is a diverse subject, and not all aspects can be covered in equal breadth and depth within a single undergraduate or postgraduate curriculum. Biosciences students should gain a foundation in a wide range of processes from the fundamental molecular basis of life to systems biology and whole ecosystems, as appropriate to the emphasis of the course.

3.3 Biosciences courses should **support students to recognise that some of what they are taught is contested and provisional**, particularly in the light of continuing scientific advances. Students should **be supported to appropriately challenge, question, think critically about their subject**, and understand that uncertainty is a key concept in Biosciences. The historical **and social** context of the subject should be considered, as discussed in section 1.

3.4 Biosciences degree courses generally include the following content and approaches to study.

Core knowledge

- A broadly based core curriculum defined by the particular emphasis of the course, and providing knowledge and skills relevant to the wider context of Biosciences, including specialised in-depth study of selected aspects of the subject. Biosciences courses should adopt an interdisciplinary and multidisciplinary approach to advancing knowledge and understanding of the **multivariate and interconnected nature of environmental** processes and mechanisms of life, from molecular to cellular, and from organism to ecosystem **and how anthropogenic activities directly and indirectly impact these processes and systems.**
- Awareness of the complexity and diversity of life and the interrelationships between organisms and with their environment and the

abiotic/physical world and how human activities disrupt and alter these relationships in the modern day.

- Awareness of the impact of global change on Biosciences, and the knock-on effects on society and the environment.
- Engagement with the essential facts, major concepts, principles and theories associated with the emphasis of the course.
- Familiarity with relevant scientific terminology and taxonomic systems.
- Engagement with research and current developments in the biosciences.

Wider context

- Understanding of the ethical, equality, intersectionality, and sustainability issues associated with the study of the Biosciences and the application of biological knowledge globally.
- Awareness of the contribution of Biosciences to government and other regulatory policy, its influences on local and global communities, and shaping biological input to geopolitical debate and controversies.
- Understanding of how biological knowledge and its dissemination contributes to the quality and sustainability of life and health in a global context when properly conveyed, and how it can detract from these subjects when improperly conveyed or exploited.
- Understanding of international, legal and ethical frameworks regulating enterprise in the Biosciences, knowledge of how and why these have changed over time and how and why they may change in the future.
- Practical and transferrable skills.
- Competence in the design and conduct of laboratory, experimental, computational, statistical, field and/or survey skills, where appropriate to the subject and the student.
- Practical and theoretical methods of acquiring, interpreting and analysing biological information and data.
- Critical understanding of the appropriate contexts for the application of data, and appreciation of the combined strength of theoretical and practical approaches to coherent understanding of Biosciences. For example, the use of protein structure/function prediction alongside protein characterisation experimental data, or predicted impact of effectors on marine habitats alongside data from observational studies.
- Competence in a range of relevant communication techniques and methodologies, to varied audiences such as the general public, journalists and fellow researchers.

- Ability to communicate interpretation of data and statistical analyses, through a variety of media, for example live or practise-based demonstration, visual, graphical, spatial, recorded and written media.

The conduct of study and responsible, reproducible and open research in the Biosciences, demonstrating integrity, and adherence to relevant ethical, sustainable, health, safety and risk assessment processes and procedures

Personal development

- Professionalism as a student of Biosciences and as a Bioscientist.
- Awareness of the opportunities afforded by competence and knowledge in the Biosciences and the value of reflective practice in personal development.
- **Awareness of the privileges certain characteristics hold when searching for and receiving such opportunities and a commitment to help equalize access to them.**
- An appreciation of the transferability of competence and skills learned when studying Biosciences and how these are valued and in demand by employers working in industries wider than the Biosciences themselves.
- Recognition of the employability and social benefits of teamwork, including a practical understanding of equalities, inclusivity, **and representativity and the value of diverse thinking and backgrounds** in teams.

Teaching and learning

3.5 Teaching and learning strategies are designed to scaffold the acquisition of subject knowledge and skills by moving from study methods that are structured and supported towards more independent and self-directed activities. As the course advances, students become increasingly responsible for their own learning in preparation for the rest of their professional careers, **ensuring they are equipped with multidisciplinary skills and informed decision-making capabilities.** Progression is enabled and reinforced by a diversity of learning and teaching methods that are matched to the expressed learning outcomes **and the needs of**

the student cohort. This Subject Benchmark Statement does not aim to be directive about the methods used for a particular course but, rather, provides the basis for reflection in relation to what might be appropriate for a course, and the modules contained within that course. Integrating topics across the course is essential to ensure effective teaching and integrated learning. Teaching and learning strategies should be designed to be enriching, stimulating, challenging, effective and enjoyable.

3.6 Learning and teaching strategies in the Biosciences are not static but adapt to changes in philosophy and technology in innovative ways that are accessible and inclusive to all. In this context, there is an expectation that all staff who contribute to student learning - including demonstrators, and temporary and visiting lecturers, as well as permanent academic staff - should have access to a range of educational professional development opportunities. Strategies should be student-centred and utilise a range of delivery methods, as appropriate, to incorporate experiential, practical and formal academic practice. Teaching sessions may be synchronous, asynchronous, or a blend of modes. Synchronous delivery may be face-to-face, remote or a hybrid of these, to increase accessibility **and reduce environmental impact**. Asynchronous learning is typically delivered using a range of digital tools and techniques. Live sessions may be recorded for self-directed study and consolidation of learning. Independent learning can be encouraged using pre/post-session student activity. It is considered good practice to use a range of different activities and reflect on how, for example, module choice by students might influence the range of activities available to them.

3.7 Synchronous learning activities may include, but are not limited to:

- seminars, tutorials, lectures
- laboratory classes
- case-studies, problem-based learning, team-based learning
- workshops, including sessions led by employers/external stakeholders
- fieldwork and visits
- peer and collaborative learning, including the use of social media
- other interactive sessions, including debates, quizzes and poster presentations
- work-based placements, **relevant local community engagement** or other appropriate professional experience.

3.8 Asynchronous learning activities may include, but are not limited to:

- self-directed study and research using a variety of resources
- simulations
- recordings (taught sessions and laboratory demonstrations) and broadcasts
- virtual laboratory and field experiments
- pre/post-laboratory/field and pre/post-session exercises
- peer and collaborative learning, including the use of discussion fora and quizzes
- research projects
- reflective practice and portfolio building.

Assessment

3.9 Assessment strategies are designed to recognise achievement of learning outcomes and competencies, and to discriminate between such achievement at threshold and higher levels. Strategies include a varied range of formative and summative assessment and may include self and peer-assessment. They provide evidence to employers of graduate attributes. Assessment is progressive in terms of level and content and leads to effective, **timely and actionable** feedback to enable development of students' knowledge and skills, including transferable skills. In this increasingly digital world, such skills include digital literacy **and green skills both in and outside of the biosciences**. Opportunities are present to exploit this and diversify how students are assessed, ensuring a range of methodologies which allow students from all backgrounds and characteristics to demonstrate their learning and development. Assessments should be authentic, with real-world application to enhance employability skills and professional development **and contribution to science and an equitable society**. They should **be designed to include and allow all students to perform at their best but, where such accessibility cannot be fully embedded**, also allow for reasonable adjustments to ensure inclusivity **and equity**.

3.10 The following principles should be considered when designing an inclusive accessible assessment strategy.

- Assessment should be of, and for, learning and associated with effective feedback.
- Assessments should be valid, reliable and consistent, and provide a means for students to demonstrate mastery of a topic **and/or skillset beyond information recall**.

- Assessment and feedback should explicitly take into account accessibility and EDI considerations.
- Information provided about assessment and feedback should be explicit, accessible and transparent.
- Assessment and feedback should be planned to ensure students and staff can manage their workloads effectively.
- Assessments and feedback should be integral to the course of study and clearly relate to the learning outcomes.
- Assessment and feedback should give the student the opportunity to validate knowledge and understanding.
- Assessment and feedback should align with accreditation and approval requirements as necessary.
- An appropriate balance of formative and summative assessments should be provided, with helpful interrelation between the two forms.

3.11 Themes for authentic assessment include, but are not limited to:

- practical applications and professional competencies, such as laboratory, field-based, placement activity
- collaborative working, such as peer assessment, enquiry-based learning and group work
- integrative assessments, including capstone projects and dissertations
- a range of styles of scientific communication aimed at a range of audiences, such as posters, graphical resources, videos and websites
- professional scientific communications, including journal articles, reports and poster presentations
- professional skills, including reflective writing and portfolios.

3.12 Any of the above themes could be examined via coursework, facilitated in-person or remotely, or via unseen, seen or open-book invigilated or take-home examinations.

3.13 At integrated master's level, there is a strong emphasis on requiring students to apply their knowledge of Biosciences to the solution of unfamiliar problems. Assessment of the full range of research skills is also considered crucial in determining whether master's level learning outcomes have been achieved.

3.14 Feedback should be personal, individual, understandable, empowering, manageable and developmental. It should be timely, relevant to the assessment brief and accompanied by access to interpretative support/advice. Feedback should allow students the opportunity for supportive reflection on their academic

and professional development. The nature, extent and timing of feedback for each assessment task should be made clear in advance.

4 Benchmark standards

Benchmark standards

4.1 This Subject Benchmark Statement sets out the minimum threshold standards that a student will have demonstrated when they are awarded an honours degree in Biosciences. Demonstrating these standards over the course of study will show that a student has achieved the requisite range of knowledge, skills and understanding expected of graduates in Biosciences. They also indicate excellent levels of achievement to assist course teams in setting their own internal standards.

4.2 The majority of students will perform significantly better than the minimum threshold standards articulated below. Each higher education provider has its own method of determining what appropriate evidence of this achievement will be, and should refer to [Annex D: Outcome classification descriptions for FHEQ Level 6 and FQHEIS Level 10 degrees](#). This Annex sets out common descriptions of the four main degree outcome classifications for bachelor's degrees with honours: 1st, 2.1, 2.2 and 3rd.

4.3 As indicated elsewhere in this Statement, the range of Biosciences degree courses offered by UK higher education providers is sufficiently broad that one set of detailed and restrictive standards for all courses that may be covered by this Subject Benchmark Statement would not be helpful. The benchmark standards in this Statement are therefore broad and generic, and focus on core knowledge and skills development, allowing course teams to offer variety in subject-specific content.

4.4 Tables 1 and 2 articulate standards at the levels of 'threshold' and 'excellent'. These are defined as:

- threshold standard: the minimum required to gain an honours degree; graduates at this level demonstrate an acceptable level of ability and skills
- excellent standard: the level required to gain a first-class degree; graduates at this level consistently demonstrate advanced knowledge, understanding and skills.

4.5 To reach a given standard at the point of completion of an honours degree in the subjects covered by this Statement, students demonstrate

achievement across the main outcomes in Tables 1 and 2, interpreted for the specific degree course. However, higher education providers use a range of algorithms to decide final classifications, so a lower performance in one outcome may be compensated for by a higher performance in another.

Table 1: On graduating with an honours degree in Biosciences, graduates will have the following core knowledge, understanding and skills

Benchmark outcome	Threshold standard	Excellent standard
Describe, discuss and understand the key biological concepts and phenomena relevant to the course (see paragraph 3.4) confidently, accurately and in detail, using appropriate terminology.	Recall basic knowledge of key biological concepts and phenomena relevant to the course, and explain these using appropriate terminology.	Apply a comprehensive knowledge of biological concepts and phenomena to discuss and explain essential aspects of the course, and show evidence of enquiry beyond this.
Be aware of the full breadth of the Biosciences, from molecular to cellular, and from organism to ecosystem.	Demonstrate an awareness of the breadth of the Biosciences.	Apply a broad awareness of the breadth of the Biosciences to biological phenomena, processes and problems.
Apply knowledge and understanding of biological systems and methodologies to design experiments and to solve theoretical and practical problems, with awareness of appropriate controls, possible bias, ethics and sustainability.	Demonstrate an understanding of basic experimental design and application of methods to solve routine problems relevant to the course, with some awareness of appropriate controls, possible bias, ethics and sustainability.	Devise and evaluate solutions to solve both routine and unfamiliar problems using a range of methods, including awareness of appropriate controls, possible bias, ethics and how to ensure sustainability or justify unsustainable methods when an experiment will provide significant insight in how to increase global sustainability or when the risk to health is too great.

Describe, document and enact safe working practices in terms of managing biological, chemical, laboratory or field-based risk to people, other organisms and the environment through knowledge-based risk assessments and practical activities.	Produce and follow risk assessments for completing practical work in a safe and reliable manner with support.	Independently produce and apply risk assessments for completing practical work in a safe and reliable manner.
Select and carry out appropriate quantitative and qualitative practical (laboratory, field or computational) techniques to solve problems relevant to the course, including consideration of the theoretical basis, limitations and environmental impact of various techniques.	Demonstrate competence in a broad range of appropriate qualitative and quantitative practical (laboratory, field or computational) techniques relevant to the course, including knowledge of their limitations and environmental impacts.	Design, optimise and demonstrate competence in a broad range of appropriate qualitative and quantitative practical (laboratory, field or computational) techniques relevant to the course, with a high degree of autonomy, efficiency and consideration of environmental impact.
Use appropriate databases computational techniques and tools, to aid further understanding and insight of biological processes.	Apply computational techniques and tools to investigate familiar biological concepts covered in course content and report outcomes using appropriate terminology.	Select and apply appropriate computational techniques and tools to investigate complex biological concepts and critically evaluate and report outcomes using appropriate terminology.
Engage with literature from the Biosciences to develop insight into the subject.	Demonstrate knowledge of the evidence base for scientific claims, by accessing primary literature and commenting on the adequacy, modern	Identify and select appropriate sources of biological information, including primary literature, and appraise and evaluate the adequacy

	relevance and sustainability of the methods, data and interpretation therein.	of methods, data, their interpretation and possible improvements such as environmental and global sustainability considerations , with a high degree of independence.
Complete independent open-ended investigative work through a project/research-based assignment relevant to the course. This could be a laboratory or field-based project, a literature review, and/or collecting and evaluating data from a variety of sources.	Demonstrate planning, execution and presentation of a piece of independently produced work which includes analysis or evaluation of data within a supported framework, demonstrating some evidence of time management, problem-solving and independence.	Demonstrate highly independent and competent planning, execution and presentation of a piece of independently produced work which includes the analysis and critical evaluation of data, demonstrating high levels of time management, problem-solving and independence.
Appreciate the contribution of Biosciences to the innovations that characterise the modern world, and the potential of Biosciences graduates from this field to develop sustainable solutions to current and future challenges .	Identify and discuss application of Biosciences in solving current and future challenges in the world and demonstrate some understanding of the role of Bioscientists in this.	Explain, suggest and critique ways in which Biosciences and Bioscientists can contribute to solving current and future world challenges, considering the impacts on people, other organisms and the environment both globally and locally .
Recognise the relationships and interfaces between Biosciences and other subjects (both scientific and outside of the sciences), such that they are able to operate effectively in a multidisciplinary environment.	Identify and explain relationships between Biosciences and other subjects relevant to the course content.	Explain and evaluate the contribution of Biosciences to solving interdisciplinary challenges and the role of interdisciplinary thinking in solving scientific problems with equity, justice and sustainability .



Use appropriate databases computational techniques and tools, to aid further understanding and insight of biological processes.	Apply computational techniques and tools to investigate familiar biological concepts covered in course content and report outcomes using appropriate terminology.	Select and apply appropriate computational techniques and tools to investigate complex biological concepts and evaluate and report outcomes using appropriate terminology.
Deploy mathematical and statistical concepts, processes and tools, such as the manipulation of equations and graphical and statistical analysis, to solve problems or evaluate data.	Use mathematical and statistical concepts, processes and tools to solve familiar problems or evaluate data.	Select, use and evaluate appropriate mathematical and statistical concepts, processes and tools to solve problems or evaluate data.
Collect qualitative and quantitative data from investigations relevant to the course, and analyse and interpret this data to allow testing of hypotheses, contextualising of findings, presentation of findings, and suggestions for further lines of investigation.	Demonstrate accurate data collection, including selection of appropriate methods for analysis, interpretation of findings to test hypotheses, consideration of further lines of investigation and manipulation of data for effective presentation.	Demonstrate independent and accurate data collection, including selection of appropriate methods for analysis, interpretation of findings to test hypotheses, consideration of further lines of investigation and manipulation of data for effective presentation, with a thorough understanding of the context of the investigation within the field.
Collaborate and work successfully and inclusively in a group environment, contributing positively and flexibly to team outputs.	Effectively participate in group and teamwork, demonstrating clear contributions to the work.	Identify and apply effective strategies for working in a group environment and provide clear and valuable contributions to team outputs, demonstrating good

		teamwork and/or leadership skills.
Communicate effectively, selecting appropriate content, media and methods for the audience, purpose and subject.	Communicate information, ideas, problems and solutions, verbally and/or non-verbally, with clear expression and style.	Communicate information, ideas, problems and solutions to an accomplished level, verbally and/or non-verbally, at a level consistently appropriate for the audience.
Apply ethical awareness to working in the Biosciences, appreciate the historical context of the subject and the societal and environmental impacts of advances in the Biosciences.	Describe some of the ethical issues and societal and environmental impacts of advances in the Biosciences, with some acknowledgement of the historical context of the subject.	Understand and evaluate ethical issues and the societal and environmental impact of advances in the Biosciences, with some understanding of the historical context of the subject.
Stay up to date with advances in the Biosciences, including sustainability, and appreciate the fluid nature of knowledge that evolves as new findings emerge.	Awareness of how new findings may change current understandings of various topics in the Biosciences, that many aspects of the subject are not fully understood and demonstrate some ability to stay up to date with new findings.	Clear appreciation of the fluid nature of knowledge in the Biosciences, including an ability to incorporate new findings into previous understanding of various topics.
Act professionally, with due regard for legal, ethical, environmental and societal responsibilities, modelling good practice that promotes positive, sustainable and inclusive perceptions of the Biosciences and Bioscientists.		

4.6 All graduates, regardless of the classification of their degree, should have the skills, knowledge, and confidence to tackle the climate and ecological crisis on completion of their studies in higher education. This includes a deep understanding of the complex and dynamic interactions within the biosphere and the ability to apply systems-thinking to environmental challenges. All Bioscience graduates should demonstrate insight into the importance of sustainability within their field, recognising the need for both local and global action to address environmental issues. They should be equipped to identify the multivariate and interconnected ways of taking affirmative action for the climate, encompassing ecological, social, economic, and political dimensions.

All Bioscience graduates should demonstrate a critically informed understanding of the ways that climate change shapes systems and societies across spatial and temporal scales. This involves an appreciation of the historical context of environmental changes and their future implications. They should be aware of the impacts of anthropocentric activities on different communities, especially marginalised and Indigenous populations, and how these communities are often disproportionately affected by environmental crises.

Furthermore, an education in Biosciences should enable graduates to critically evaluate the limitations of current practices and technologies, and to envision and implement more sustainable alternatives. All Bioscience graduates should emerge as advocates for sustainability, capable of making informed, ethical, and effective contributions to solving the climate and ecological crises.

Table 2: Benchmark standards - in addition to Table 1 and point 4.6, on graduating with a master's degree in Biosciences, graduates should be able to:

Benchmark outcome	Threshold standard	Excellent standard
Develop, integrate, synthesise and apply the systematic and broad understanding of relevant and state-of-the-art biological concepts to solve complex problems.	With significant support and guidance.	With a high degree of independence and autonomy.
Interrogate and integrate diverse sources of scientific literature alongside other information sources, in order to design and develop methods for investigation and analysis, including in areas at the forefront of knowledge and outside their current specialist knowledge.		
Project plan, including, as appropriate, evaluation of ethics, hazards, environmental effects, sustainability and appreciation of costs.		
Develop advanced experimental and investigative skills as appropriate for the project.		
Discuss the background, context, methods, results and potential scientific, environmental and societal impact of a significant research project.		

5 List of references and further resources

QAA (2019) The UK Quality Code for Higher Education

www.qaa.ac.uk/quality-code

QAA and Advance HE (2021) Education for Sustainable Development Guidance

www.advance-he.ac.uk/guidance/teaching-and-learning/transforming-assessment

HEA (2016) Framework for embedding employability in higher education

QAA (2018) Enterprise and Entrepreneurship Education: Guidance for UK Higher Education Providers

www.qaa.ac.uk/docs/qaas/enhancement-and-development/enterprise-and-entrepreneurshipeducation-2018.pdf

QAA (2019) Characteristics Statement: Higher Education in Apprenticeships

www.qaa.ac.uk/the-quality-code/characteristics-statements/higher-education-in-apprenticeships-characteristics-statement

QAA (2019) Annex D: Outcome classification descriptions for FHEQ Level 6 and FQHEIS Level 10 degrees

www.qaa.ac.uk/docs/qaa/quality-code/annex-d-outcome-classification-descriptions-for-fheqlevel-6-and-fqheis-level-10-degrees.pdf

United Nations Department of Economic and Social Affairs, Sustainable Development Goals

<https://sdgs.un.org/goals>

Royal Society of Biology

www.rsb.org.uk

Chartered Institute of Ecology and Environmental Management

<https://cieem.net>

Committee of Heads of Environmental Science

<https://ches.info>

6 Membership of the Advisory Groups for the Subject Benchmark Statement for Biosciences

Membership of the Advisory Group for the Subject Benchmark Statement for Biosciences (2023)

Dr Helen Watson (Chair)	University of Plymouth
Professor Jonathan R Green (Deputy Chair)	University of Birmingham
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Membership of the review group for the Subject Benchmark Statement for Biosciences (2019)

The fourth edition, published in 2019, was revised by QAA to align the content with the revised UK Quality Code for Higher Education, published in 2018. Proposed revisions were checked and verified by the Chair of the Subject Benchmark Statement for Biosciences from 2015.

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Dr Jacqueline Nairn	University of St Andrews
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Professor Robert Slater	Formerly University of Hertfordshire
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The Royal Society of Biology contributed to the review process by coordinating and facilitating feedback from their members.

Feedback was also collected from the Royal Society of Biology Employer Advisory Group.

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University of Wales

University of Central Lancashire

King's College London

The University of Edinburgh

University of Strathclyde

The Nutrition Society

University of Paisley

The Open University

University of Ulster

Liverpool Hope University

University of the West of England, Bristol

Aston University

University of Hertfordshire

University of Dundee

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