

THE
INTERNATIONAL
ACCREDITATION
HANDBOOK

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About the Royal Society of Biology

The Royal Society of Biology is a single unified voice for biology: advising Government and influencing policy; advancing education and professional development; supporting our members; and engaging and encouraging public interest in the life sciences. With more than 18,000 individual members and over 100 member organisations, the Society represents a significant and diverse membership including students, practising scientists, industry leaders, academics and interested non-professionals.

The Royal Society of Biology is committed to promoting biology as a subject of choice to students in schools, colleges and universities. Through accreditation, we support and recognise excellence in biology teaching; champion a biology curriculum that challenges students and encourages their passion for biology; support young scientists through higher education; and provide career guidance at all levels. We offer a range of tools to assist the professional development of our members working in education; we respond to education policy consultations; and we contribute to curriculum development. Through partnership with other leading science organisations, we aim to increase our influence over the advancement of biology education.

For information about the Royal Society of Biology, see www.rsb.org.uk

Introduction to accreditation

Accreditation is acknowledgement by an external body that a programme meets a defined set of overarching criteria. Accreditation by the Royal Society of Biology (RSB) recognises and supports the advancement of skills and education in the biosciences, throughout the UK and internationally. Graduates from accredited programmes are equipped with well-rounded knowledge and skills, making them highly employable both within and beyond their chosen field.

Accreditation aims to:

- Recognise academic achievement
- Drive up standards of learning and teaching in the biosciences
- Enhance competitiveness for students in a global jobs market
- Provide industry with an assurance of the level of employability skills and subject relevant bioscience skills provided by a programme
- Provide an international mark of "good practice" allowing wide ranging comparability among high performing institutions

The biosciences are predominately an experimental set of subjects, which require a hands-on approach to learning. Accredited programmes incorporate learning outcomes associated with key skills in laboratory and/or fieldwork thereby providing a high standard of competence. Transferable graduate skills such as communication, problem solving and team working are integral to the programmes. Biologists must be equipped with the skills necessary for self-learning and the ability to apply basic principles of maths, chemistry, physics and information technology to their learning and career. These should be taught and assessed at all levels, providing a gradual development of ability and self-confidence in students, culminating at graduation. Students will have been encouraged and supported to develop their creativity, innovation and entrepreneurship.

All graduates will have experienced self-learning and will have satisfactorily completed a substantial integrative experience (either capstone experience or a period of practice, depending upon the type of accreditation) demonstrating independence of thought and analysis of data.

Accredited programmes are highly regarded within the learning and teaching community and by employers. Accredited programmes are delivered by subject experts and produce graduates who will excel in their chosen field.

The accreditation process does not seek to define a highly specified curriculum. Accreditation is built on the foundations of the relevant UK Quality Assurance Agency (QAA) Benchmark Statements as a general description about the broad minimum standards of achievement, while focussing on those areas that the RSB believes fully prepare bioscience graduates for their place in the world.

Accreditation is based on the assumption that the course can be defined as 'biology' or a sub-section or specialism within biology. It may not be appropriate for courses where the overall objective of the course is not biology *per se*, but where biology may be a component (e.g. pharmacy and health-care professions). Such courses may not encompass all the necessary intended learning outcomes for a biology programme, and may be accredited by other professional or statutory bodies.

The RSB is keen to support all bioscience programmes that aim to meet the criteria for accreditation. For established programmes, the learning outcomes attained by graduates will be judged. However, we also encourage universities to submit new programmes for accreditation, where there are no graduates yet. Under these circumstances, the accreditation process will include a review of the programme documentation and a site visit before the first cohort of students graduate. The Society may grant interim accreditation pending first cohort graduation, with full accreditation occurring afterwards, if appropriate. Universities with relevant programmes in development should refer to Appendix F, and contact the Accreditation Team to discuss interim accreditation.

We welcome applications from programmes taught in languages other than English; however, please note that all documentation and supporting evidence must be supplied in English for assessment purposes.

About this document

The Society accredits programmes of study that lead to specified named awards. This handbook is the main source of reference for those institutions seeking to apply for International Degree Accreditation, Advanced Accreditation and Master's Degree Accreditation. The following sections of the handbook apply to all types of accreditation: benefits; process and costs of accreditation; degree regulations; articulation agreements; process for re-accreditation; and subject specific criteria and appendices. Only final awards are accredited. The BSc Honours is not assessed nor accredited within Advanced Accreditation, a separate application is required. The Society does not currently offer accreditation of Postgraduate Certificates and or Postgraduate Diplomas.

Which type of accreditation to apply for

The RSB's Accreditation Programme spans across the Higher Education landscape from Level 4 FHEQ through to Level 8 FHEQ. All accreditation programmes share core principles: to recognise academic excellence in bioscience degree programmes, drive up standards and meet the needs of employers. The type of accreditation awarded will depend on the type of programmes submitted, please see below.

For further guidance, please contact the Accreditation Team at accreditation@rsb.org.uk.

Degree Accreditation	Advanced Accreditation	Master's Degree Accreditation
Please refer to page 14	Please refer to page 25	Please refer to page 28
UK & International	UK & International	UK & International
BSc (Hons) programme (may include sandwich year or placement year degree pathways)	BSc (Hons) with Professional Placement year/MSci Integrated Master's 4 year programme	MSc 1 year stand-alone Master's degree programme
Level 4 – 6 FEHQ	Level 4 – 6/7 FHEQ	Level 7 FHEQ

Defining features

Capstone experience minimum 30 credits ¹	Period of Practice minimum 80 credits ¹	Research component is equivalent to 80 credits ¹ , minimum 60 credits accounted for by the project
Graduate employability and transferable skills	Enhanced research skills	Period of Practice must be completed in an active research environment
	Period of Practice must be an evaluated working experience in an active research environment	

Membership and Professional Registers

One year free membership at AMRSB (first year post graduation)	One year free membership at AMRSB (first year post graduation)	One year free membership at AMRSB (first year post graduation)
	AMRSB members can become MRSB after two further years of work or professional practice, rather than the usual three years	AMRSB members can become MRSB after two further years of work or professional practice, rather than the usual three years

¹ One credit is notionally ten hours of student effort, assuming that one academic year is 120 credits, and one calendar year is 180 credits: 80 credits is equivalent to 40 European Credit Transfer and Accumulation System (ECTS) credits.

Benefits of accreditation

Benefits of accreditation for HEIs

Recognition of academic quality

Accreditation provides a mark of 'good practice', as well as providing an assurance to employers that graduates have appropriate skills and knowledge, increasing graduate competitiveness in the global jobs market.

Enhanced student recruitment opportunities

Potential students have the confidence in knowing they will study a course that meets a set of criteria determined by bioscience professionals independent of the institution. Accreditation is informed by the needs of employers and developed in collaboration with experts from industry. Employers recognise the value of accredited degree programmes and the graduates they produce.

External review of programmes and mechanism to drive change within an institution

The process of accreditation not only assesses degree programmes but also shares and highlights good practice. As part of the application process, programmes will be assessed by senior academics who may suggest improvements to the programme, and identify existing areas of excellence. As such, institutions that have undergone an assessment have reported that the process of accreditation is extremely beneficial in its own right.

Publicity following successful accreditation

Institutions will be entitled to use the RSB logo and associated literature to advertise that the degree(s) is accredited (online and in printed literature). The RSB will advertise the institution as accredited on our website, which is viewed by prospective students looking to study a bioscience degree. Institutions will be able to quote aspects of good practice, highlighted during the visit, on their website and at open days.

Benefits of accreditation for students

Greater employability prospects and enhanced competitiveness in a global jobs market

The accreditation programme establishes a profile of key skills that bioscience employers can recognise in graduates from accredited degrees. Many employers use evidence-based recruitment processes: graduates will have evidence of education, training and assessment in many key subject-specific skills (e.g. as provided to the RSB by Learned Societies) and transferable skills.

Professional body accreditation of their degree

Stands out to employers, shows that degrees have been assessed and enhanced by the accreditation process, and provides additional evidence of graduates' knowledge and skills.

Professional Registers

Graduates from accredited foundation degree and doctoral training programmes are able to obtain external professional recognition of their skills, knowledge and expertise, and commitment to Continuing Professional Development (CPD) from the RSB.

Free membership/registration to the RSB

Graduates from accredited programmes are entitled to free subscription to the Society (except for doctoral training programmes, who get a free application for CBiol instead). This will enable access to a significant network of bioscience professionals, making it easier to stay up-to-date with biology-related developments (e.g. via the free weekly bulletin of key discoveries, initiatives and policies worldwide) and provide graduates with additional recognition of their skills and experiences. This is extremely beneficial to graduates, particularly at a time when they are applying for their first employment. Membership of the Society gives students and graduates a feeling of belonging to a wide community of biologists, interested in biology for its own sake but also to contribute their knowledge and skills to help meet world challenges.

Quotes in support of accreditation

UK Institutions

"Our experience with the RSB has been nothing other than superb; I would have no hesitation in recommending the RSB to all my colleagues and students. The Accreditation Team were exceptionally professional and more importantly knowledgeable and helpful which made the accreditation process a joy."

Dr Chris Tselepis | Programme Director for Biomedical Science | University of Birmingham

[Accreditation] "was for us as a course(s) team, a very useful and rewarding experience. It made us reflect on our teaching and assessment, challenged us to be self-critical and gave us extremely valuable advice and guidance to improve our students' experience."

Dr Elaine Green | Associate Head (Quality and Accreditation) | Coventry University

"We have always had a good experience in the last few years of working with the Royal Society of Biology, and our experience of applying for Master's Accreditation was no exception. Throughout our engagement with the pilot phase of the Master's accreditation scheme, it was clear that RSB were genuinely seeking to enhance education and skills within the sector. The site visit was professional, constructive and supportive, and while the recommendations made have enhanced our programmes it has also given us cause to reflect upon and celebrate the strengths of our postgraduate provision."

Dr Dan Lloyd | Director of Graduate Studies | University of Kent

"The process was excellent and we always knew what we had to do. I think the instructions are very clear and the process is of a very high and professional standard."

Dr Karin Garrie | Biosciences Undergraduate Courses Manager | Nottingham Trent University

"Thanks to [the panel] for their valuable feedback on our pathways - we very much appreciate their attention to detail and their positive approach to the discussion. It was a pleasure to engage with you all."

Dr Angela Mousley | Programme Coordinator (Biological Science) | Queen's University Belfast

"I found the process of the panel visit very thought provoking and productive, and a very worthwhile undertaking."

Dr Shauna Cunningham | Course Leader for Applied Bioscience | Robert Gordon University

"We were very excited to be involved in the accreditation process for our foundation degree programme and then to be awarded accreditation status. We wanted to have the recognition for our graduates and improve their employability as well as have an opportunity to both identify what we do well and to drive forward change for how we could improve the programme. The process was rigorous but enjoyable and extremely rewarding for the whole programme team and the students involved. Accreditation really took into account the unique aspects of degree level bioscience teaching in our HEI. We have made some changes to the programme following accreditation that will really enhance what we do to prepare our students for their continuing careers."

Luke Peakman | Programme Manager and Lecturer | South Devon College

"The accreditation process was extremely useful to us, including the mapping out of our degree schemes and skills, meeting yourselves and getting the opportunity to share our Swansea University Bioscience experience and the positive outcome of gaining accreditation. It was a lot of hard work for us, but it has really helped us to focus and refine our curriculum, it was a very positive experience."

Dr Penny Neyland | Biosciences Programme Director | Swansea University

International Institutions

"This is a major step forward in our quest to become a leader in higher education excellence in Africa. The validation of our training quality by the RSB helps us attract the best students and gives funders further confidence to invest in our programmes."

**Professor Gordon Awandare | Head of Department of Biochemistry, Cell and Molecular Biology
| University of Ghana**

"The RSB team put us at ease i.e. that they were not there to attack the programme but to help us make it a better one and help guide us through the application procedure."

Dr Susan Ho | Deputy Enrolment Officer | Hong Kong Polytechnic University (PolyU)

"External audit of our programme in Biological Sciences through international accreditation proved to be an excellent way to ensure that it remained relevant and of high quality. We found the process developed by the RSB to be well-thought-out, constructive and helpful. Accreditation will undoubtedly enhance the employment prospects of our graduates."

**Professor C. David O'Connor | Head, Department of Biological Sciences | Xi'an Jiaotong-
Liverpool University**

Industry

"Covance is always in search of graduates who demonstrate they have industry skills, knowledge and, most importantly, the desire to be exceptional in their field. We've found graduates from the Degree Accreditation Programme bring diverse and emerging skills. Our hiring managers appreciate how quickly they demonstrate their academic rigor as they swiftly respond and adapt to real-world situations on the job."

Robert Watts | Covance

"We believe that by accrediting degrees, students and employers will be better placed to identify quality courses that provide depth of study in their discipline and strong practical skills. In future, we are confident students who graduate from these courses will have the opportunity to find rewarding work in the life sciences sector or can go on to undertake further research as a postgraduate."

Stephen Whitehead | CEO | Association of the British Pharmaceutical Industry

"To deliver the next generation of life changing medicines we need to recruit talented young scientists who combine a passion for drug discovery with strong fundamental science knowledge. All our applicants undergo a thorough assessment process designed to test their scientific and technical knowledge, ensuring that our new recruits can be confident and effective in a laboratory environment from day one. This is why at AstraZeneca we support degree accreditation by the Society of Biology and actively encourage applications from graduates with accredited degrees – it really can help individuals stand out from the crowd."

**Donna Watkin | Global Graduate Programme Manager AstraZeneca, Research & Development |
Innovative Medicines**

"MedImmune recognises that strong scientific knowledge is integral to much of its success. And when we, as potential employers, are looking out at the outside world, we need a way to understand and evaluate the research that has been undertaken by applicants. That's why the Royal Society of Biology's Degree Accreditation Programme is so valuable. It provides a very visible signal of the quality of a degree and the high standard of academic rigour which students on those degree courses achieve. This naturally translates into an assurance of employability for those students who complete those courses."

Jacqui Hall | Vice President; Learning, Standards and Skills | MedImmune

Process of accreditation assessment

The accreditation assessment process is normally achieved in three stages and will generally take a period of six to twelve months. This is outlined in Figure 1, with further information on the method of submission in Appendix A.

Applications will be considered as soon as possible following receipt of the submission. If the application appears to meet the requirements of stage one, as described below, then the site visit will be arranged by mutual convenience of the Society and the University. Please note that students and recent graduates (if applicable) need to be present during the site visit. The assessment reports produced by the Accreditation Assessment Panel will not be made publicly available.

01

Stage One

Universities are required to submit, electronically, evidence to the Society in support of their application. Full details are listed in Appendix A. This process, designed to be brief and not to replicate existing paperwork or to be unduly bureaucratic, outlines how the institution believes that it achieves the intended learning outcomes as stipulated in the accreditation criteria.

The application will be assessed by an Accreditation Assessment Panel (the Panel), which will produce a Stage One Report summarising the assessment. This will be sent to the University for fact checking and will act as a guideline for questions likely to arise at stage two. Universities will have the opportunity to submit additional evidence following receipt of this report.

If the programme is deemed suitable, the Panel will recommend that the application progresses to assessment stage two. However, in some cases, the Panel may feel that the programme is not appropriate for further assessment and recommend it is not accredited.

02

Stage Two

The Panel will carry out a site visit to evaluate the university's facilities, speak to students about their learning experience, and hold face-to-face discussions with the programme team. Key staff with direct responsibility for resources should attend the meeting and/or be available throughout the day. A provisional recommendation on accreditation will be provided during the site visit where appropriate. Outcomes of stage two will be summarised in a Stage Two Report and sent to the University for fact checking.

The Panel will make a recommendation to the Accreditation Committee to award or withhold accreditation. Universities will be kept informed of likely timescales involved for ratification to occur.

03

Stage Three

The Accreditation Committee will make a decision that:

1. The programme should be accredited
2. The programme should be accredited subject to conditions
3. The programme should not be accredited

A Stage Three Report will be sent to the University where actions relating to conditions and/or recommendations should be evidenced. The University will have a period of six weeks to complete the Stage Three Report and provide any supporting documentation. Accreditation is not formally awarded until the Stage Three Report has been completed.

Accreditation awarded

Following a successful assessment, accreditation will normally be awarded for a period of five years. The RSB will list accredited degree programme titles and universities on its website, and provide a link to the universities' web pages. Universities are required to provide graduate destination data for all accredited programmes on an annual basis.

Graduates from accredited programmes will receive one year of free membership of the Royal Society of Biology at Associate level (AMRSB).

Graduates from advanced accredited degree programmes will receive one year of free membership of the Royal Society of Biology at Associate level (AMRSB). Additionally, in recognition of the period of practice, the RSB will offer graduates of advanced accredited programmes membership of the Royal Society of Biology at MRSB level after just two further years of practice, rather than the usual three years.

For more information on publicity guidelines following accreditation, please see Appendix E.

Accreditation subject to conditions

The University will receive a Stage Three Report listing any conditions, and details of the actions taken to address the highlighted areas will be required. The University will have a period of six weeks to complete the Stage Three Report and provide any supporting documentation. Accreditation is not formally awarded until the Stage Three Report has been completed.

If internal approval is required for the amendments, then it would normally be expected within the six weeks, however extensions can be granted on a case-by-case basis.

Accreditation withheld

If the programme does not meet the accreditation criteria, guidance will be provided by the RSB on how the programme could meet the criteria. Usually the programme will not be reconsidered for accreditation until a period of 12 months has elapsed from the date the Stage Two Report is received by the University. For reconsideration, a full report will be required from the programme organisers explaining and documenting changes made to address each of the points made by the Accreditation Assessment Panel. If internal approval is required for the amendments, it would normally be expected that approval has been given before the programme is reconsidered. The Accreditation Committee shall decide whether a further full panel site visit, light touch visit, or no visit, is required.

The RSB maintains an appeals procedure for universities that wish to challenge specific decisions, where they feel that an assessment was not conducted as it should have been and in a fair and transparent manner. Universities cannot appeal against a judgement, only aspects of the process.

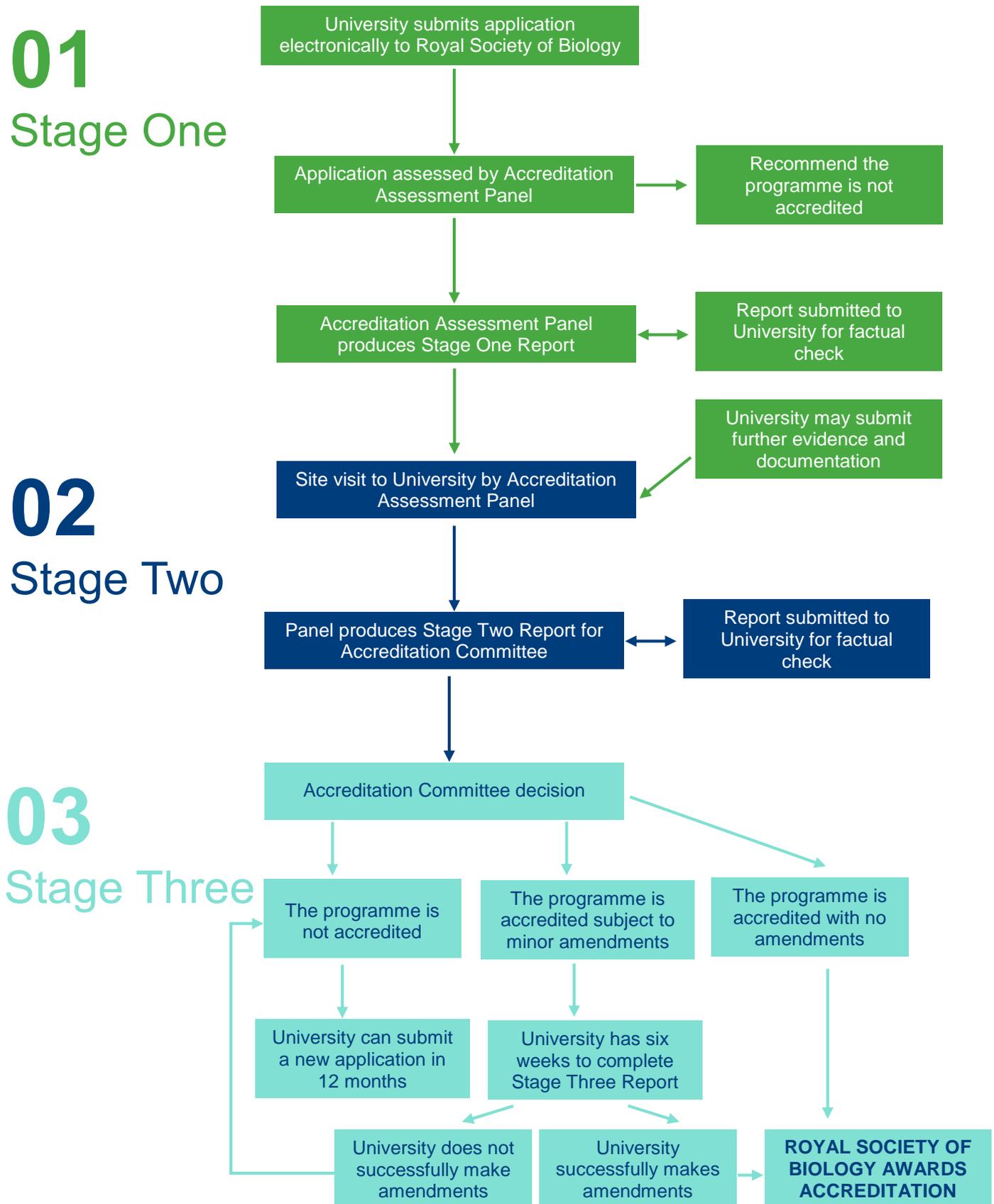
Appeals should be made to the Accreditation Committee in the first instance. If the University feels that an unfair decision has been reached by the Accreditation Committee, a follow-up appeal can be made to RSB Council, whose decision will be final. Further details about the appeals process are available on request.

Interim accreditation

Interim accreditation is available to universities for recently validated programmes where there have been no graduate awards. See Appendix F.

The international accreditation process will be conducted in accordance with English Law and the Royal Society of Biology's code of practice. As part of the accreditation process, the Assessment Panel will also consider issues relating to diversity and openness. As a minimum, the UK Foreign and Commonwealth Office (FCO) must deem travel within the country of concern to be safe for all, from time of application to time of visit. Where the FCO recommends caution, or other relevant organisations suggest there may be some risks to health or personal security, an accreditation site visit may not be possible. All international travel is at the discretion of the Royal Society of Biology.

Figure 1 – Process of Accreditation



Subject specific criteria

The Royal Society of Biology recognises the general areas outlined in the UK QAA Biosciences Benchmark Statement and the specific guidance in the Biomedical Sciences Benchmark (available at www.qaa.ac.uk/quality-code/subject-benchmark-statements#). Accredited programmes will be expected to adhere to the guidance for the Typical Standard of the current Biosciences Benchmark and/or Biomedical Sciences Benchmark as appropriate. Accredited programmes should also adhere to any subject specific guidance developed by the appropriate Learned Society written specifically for accreditation by the RSB (please see Appendix B). The subject specific criteria provided in the Benchmark Statements are not repeated here, but the assessment panel may refer to the Benchmarks when arriving at a recommendation.

Following consultation with stakeholders in the sector, accreditation spans three broad areas of biology, and applications must be made to a specific stream chosen by the University, to allow for the selection of the most suitable Panel members. These are:

- Molecular Aspects of Biology
- Whole Organism Biology
- Ecological and Environmental Sciences

Specific criteria are based on the learning outcomes for each subject area, and primarily on the required skills of graduates entering job roles, as contributed by industry and relevant Learned Societies.

Some degree programmes may meet the criteria for accreditation only if a specific combination of units or modules is selected. Where this is the case it is only possible to award accreditation if the route or pathway that meets the criteria is formally identifiable in the graduation certificate. A programme may contain modules spanning the three streams mentioned above. If this is the case the University should apply to the stream which is most relevant to the programme. When a degree is accredited it will not be labelled with a specific stream, rather the streams enable programmes to be assessed on the subject specific criteria and by the most appropriate assessors.

Degree regulations

The Society's accreditation criteria must be evident in programme learning outcomes (LOs). Unless otherwise indicated, it will be assumed that all programme LOs must be achieved by a student in order to graduate with the award. Generic regulations, and where necessary programme-specific regulations, must ensure that all students graduating with an accredited degree have achieved these outcomes. Compensation, where permitted within the regulations of the University, must only be applied if, and when, the relevant LOs are achieved in an alternative, passed, module(s) covering the same LO(s). Compensation cannot be applied if a programme LO is identified specifically and uniquely with a single module and consequently assessed only once. Specifically, compensation cannot be applied to the capstone experience.

The Society expects universities to have policies and procedures in place that support and enable students with mitigating and/or extenuating circumstances to meet the LOs of a programme.

The University must make the assessment regulations available to accreditation panels, and inform the Society annually of any changes to regulations during the period of accreditation.

Articulation agreements

If the University applying for accreditation has a formally approved articulation agreement with a Partner Organisation (PO) in the home country or overseas it must be indicated in the Letter of Intent. An articulation agreement is defined as a formal arrangement whereby PO students may transfer to the University's programme and graduate from the University. For the assessment of accreditation, the panel will wish to assure itself that key learning outcomes normally achieved in the part of the programme prior to the students' transfer (the articulation) are met.

Where universities have agreements with POs, either to franchise programmes, or to deliver equivalent programmes in other locations, these programmes will be treated as separate from the parent programme. Accreditation may look at all courses within the same application, but each version of the programme will be individually assessed for accreditation.

Costs of accreditation

Universities applying for International Accreditation will be charged a fee to cover the Society's administrative costs, including any likely costs occurred in relation to the accreditation site visit (travel, subsistence and honorariums). Universities will be required to book accommodation, including breakfast, for the panel members in a suitable nearby hotel for the duration of the site visit. Where universities are seeking accreditation of multiple programmes, the Society will determine the most appropriate fee, based on the level of similarity between programmes.

For more information, please email accreditation@rsb.org.uk.

Changes made before re-accreditation

Programmes of study evolve to reflect the latest developments in the subject and to meet the needs of students, external influences such as professional and statutory bodies and policy changes. Variations in human and physical resources may also bring about programme changes.

The University must inform the RSB immediately of any significant planned changes to the accredited programme(s), which occur during the period of accreditation, as well as providing a clear rationale for the change. Universities are required to complete and submit a review form on an annual basis, highlighting any changes that may have been made. The rationale behind any changes impacting the accreditation criteria must be explained. There may be a charge for assessing accredited programmes if significant changes have been made. The RSB reserves the right to remove accreditation from a programme if significant changes are made to the programme that deviate from the learning outcomes defined by the Society.

Re-accreditation processes

Universities that have an accredited degree programme will be contacted by the RSB towards the end of the period of accreditation to invite them to submit their programme for re-accreditation. Where there are significant changes to a programme within the accreditation period, the University may be asked to re-submit earlier.

Re-accreditation will follow the three-stage process of accreditation and will involve a full review of all programmes submitted.

If a university chooses not to apply for re-accreditation the following withdrawal of accreditation guidance will apply.

Removal of accreditation

Reasons for the Society to consider the withdrawal of accreditation from a previously accredited course:

1. Failure of the University to pay the continuing cost of accreditation.
2. Failure of the University to notify the Society of changes made to the accredited programme structure or changes that affect the delivery of the programme.
3. Changes made to the programme specification so that some of the learning outcomes are not being met.
4. Changes made to the programme specification that alter the learning outcomes so that some accreditation criteria cannot be met.
5. Any changes made to the University that result in a failure to deliver the learning outcomes of the programme which result in a departure from the Society's accreditation criteria.

The withdrawal of accreditation from a course will not be done without consultation with the University. The degree awarding University should notify the Society of change(s) made to the programme structure or its delivery, with a clear rationale for the change(s). The Society will review the changes and appoint a review panel for a site visit, if necessary. If it is found that the change(s) lead(s) to a failure to deliver a learning outcome(s) that covers accreditation criteria/criterion, then conditions will be set. If these conditions are not met within the academic year of the assessment, the accreditation status may be withdrawn.

If accreditation is removed, all reference to the RSB accreditation must be removed from websites and public documents. While the RSB understands that course guides may be published many months in advance of a new cohort starting, information on websites can, and should be, removed as soon as the accreditation is rescinded. Because loss of accreditation means that RSB can no longer comment on the quality even of degree cohorts already at the University, only cohorts who have graduated during the accreditation period can claim benefit of an accredited degree. The RSB will remove the University programmes from the list of accredited programmes maintained on the RSB website. Information relevant to the accreditation will be kept for the five years following a lapse in Accreditation, in case of questions by graduates of the programmes.

Degree accreditation

Degree Accreditation by the RSB follows an independent and rigorous assessment of degree programmes which contain a solid academic foundation in biological knowledge and key skills, and prepare graduates to address the needs of employers. The accreditation criteria require evidence that graduates from accredited programmes meet defined sets of learning outcomes, including subject knowledge, technical ability and transferable skills.

The development and experience of laboratory and/or field skills are important components of bioscience degrees. Problem solving, innovation and creativity are also important characteristics of how biological subjects are understood and applied. Evidence of the assessment of these skills, knowledge, and the ability to make interpretations based on experimental approaches is required to achieve accreditation. To that end, a central principle of accreditation is that the intended learning outcomes of a programme are linked to assessment.

The accreditation of degrees in the biosciences is based on six overarching learning outcomes. All of these outcomes require an understanding of the context and an appreciation of how the living world operates. They are underpinned by the relevant UK QAA Biosciences and Biomedical Sciences Benchmark Statements and by reference to other relevant Benchmark Statements, which should be taken as the foundation documents on which the general subject specific requirements are built.

Graduates from accredited programmes will have the specialised knowledge of their chosen discipline plus core knowledge of the biosciences, including cell biology, an appreciation of biodiversity² and the concepts and application of the theory of evolution. Their knowledge of biology will be underpinned by appropriate competence in chemistry, physics and mathematics, including statistics².

All documents linked to Accreditation can be found at www.rsb.org.uk/education/accreditation/International-Degree-Accreditation-Important-Documents.

² The extent to which these subjects are studied in depth will vary by programme (e.g. a degree in biochemistry will have a greater emphasis on physical science, whereas a degree in environmental science will include more detail on biodiversity etc.).

Criteria for degree accreditation

To achieve accreditation for a programme, Universities will need to provide robust evidence in support of their application, which will be judged by peer review against the standard metrics listed below. The evidence should show how the intended learning outcomes are being achieved through appropriate assessment strategies.

1. A graduating level capstone experience which includes the analysis and critical evaluation of data within an independently produced piece of work

The capstone experience will be:

- i. An extended piece of enquiry-based work, relevant to the degree, with a justified approach that effectively communicates the research outcomes
- ii. Underpinned by a range of relevant sources and show appropriate recognition of health, safety and ethical considerations
- iii. Contextualised, and show recognition of the provisional nature of knowledge, building to a conclusion
- iv. Based on the processes of critical thinking, challenge and evaluation

2. Demonstration of the acquisition of technical skills and familiarity with the practical environment

- i. Students learn in a hands-on, practical environment, and are trained in the technical skills appropriate to their main subject interest
- ii. Skill acquisition is a progressive process
- iii. There is a list of the core, assessed, technical skills used in the laboratory and/or field which form the foundation for the degree(s)
- iv. There is evidence of competency in the core technical skills for all students on the programme

3. The development and use of transferable skills

- i. Graduates will have the basic skills of word processing, use of spreadsheets, and presentation software
- ii. Graduates will be able to find, cite and use information
- iii. There will be clear evidence that students are given the opportunity to consider and approach problems critically, confidently and independently
- iv. Students will communicate through both oral and written approaches and to a range of audiences
- v. There will be an approach to the development of teams, including leadership
- vi. There will be evidence of acquisition of general management skills including project management
- vii. Ethical and regulatory issues are addressed

4. A foundation in mathematics, statistics, chemistry and physics within a biological context appropriate to the discipline

- i. The coverage of chemistry and physics should be of sufficient depth and breadth to provide the necessary knowledge and understanding for students to appreciate and apply these subjects within a biological context
- ii. The knowledge and appreciation of mathematical principles must be sufficient to support the understanding and application of key biological concepts and underpin problem solving at the theoretical and practical levels
- iii. Graduates will be equipped with the knowledge and skills needed to handle variation at different levels

5. Specific skills and knowledge appropriate to the degree title

- i. Bioscience graduates will have some general knowledge of the basic fundamentals of biology, including: an overview of biodiversity, the cell, basic genetics, the concept of evolution, biochemistry, molecular biology, and organismal biology
- ii. Universities will have engaged with relevant national and international Learned Societies to inform specialist curricula

6. Developing creativity and innovation

- i. Developing creativity and innovation in undergraduates is an implicit part of the student experience
- ii. Students are given the opportunity and encouragement to apply original or unconventional ideas, to be imaginative, and to tackle problem solving using techniques designed to develop individual and group creativity

The Royal Society of Biology recognises the importance of creating environments that support and promote the development of creativity and innovation. At the same time, the Society recognises that these aspects of education are at a developmental stage in many programmes and this will be acknowledged in the application of the criteria.

Details and guidance on the degree accreditation criteria

The Royal Society of Biology takes a learning outcomes based approach to accrediting degrees. Intended learning outcomes of a programme identify important learning requirements. They are understandable to students, achievable, and assessed. The Society recognises that a distinction can be made between “assessment” and “grading”. The Society does not necessarily expect every assessment to be graded, and indeed encourages Universities to consider whether grading is necessary in all cases (e.g. in the assessment of a technical skill). Advice on learning outcomes and assessment can be obtained from the Higher Education Academy www.heacademy.ac.uk.

1. A graduating level capstone experience which includes the analysis and critical evaluation of data within an independently produced piece of work

The capstone experience brings together all the learning of the degree programme. Well-designed capstone experiences should integrate the skills and knowledge, and bring reflection and focus, to the whole of the degree experience. The capstone experience gives the opportunity for students to demonstrate the understanding and skills that they have developed during their degree programme. The range and variety of capstone experiences available can develop transferable and subject specific skills, and enhance the employability of students. In particular, capstone experiences are seen as an opportunity for students to produce an independent piece of work and follow their own lines of enquiry where appropriate; this applies as much to team approaches as to individual experiences.

There are many approaches to the capstone experience. Each approach adopted must demonstrably apply elements of the scientific method, and contain a significant research component involving data collection and analysis, to be suitable for accreditation. The Society takes the view that, within this accreditation framework, no particular type of capstone experience is more or less valuable to the outcomes of graduating students. Capstone experiences could fall into any of the following categories:

- Laboratory and field-based
- Bioinformatics & computational
- Education
- eLearning/online
- Data analysis

This is not an exhaustive list, and there are many other ways in which students can demonstrate the outcomes. However, the capstone experience from an accredited programme cannot be just an extended survey of the literature (literature review), and must demonstrate the ability to critically evaluate new information.

Guidelines

A. The capstone experience should be an extended piece of work

The capstone experience tackles a central scientific question or issue in depth, which the students take ownership of. All sections of the capstone experience should relate to the same issue rather than being a collection of unrelated essays. It should reflect a significant amount of work, equivalent to at least 25% of the final year.

B. The capstone experience must be enquiry-based

There are a great variety of approaches to research, but central to these is a desire to find out something, and relate it to a hypothesis. The research can be qualitative, quantitative, laboratory or design-based, or utilize one of many other scholarly approaches.

C. The capstone experience may be interdisciplinary, but should be directly relevant to the student's discipline

The capstone experience title and aims should be appropriate to the title of the degree awarded.

D. The capstone experience should be underpinned by a range of relevant sources

Sources that inform capstone experiences include textbooks, journal articles, surveys, interviews, experiments, original data, secondary data, websites, blogs, tweets, wikis, practice reports and direct personal experience. What is appropriate depends on the type of capstone experience and the purposes that the source is being used for. It should be recognised that all sources have strengths and limitations, and reflection on the limitations and validity of the sources used is part of the process.

E. The capstone experience should be contextualised and show a recognition of the provisional nature of knowledge

Capstone experiences need to be put in to context through reference to the larger disciplinary and real-world contexts to which they are contributing.

F. The capstone experience should be firmly based on the processes of critical thinking, challenge and evaluation

The types of capstone experience made available, and the format of reports, must make it possible for the students to demonstrate how they have responded to challenge and produced an evaluative and critical report.

G. The capstone experience should have a clearly defined and justified approach

Capstone experiences should be based on systematic and rigorous methods, with a clear explanation of how these methods are applied, to achieve the purpose and goals of the capstone experience.

H. The capstone experience builds up to its conclusions and, where appropriate, will have an element of reflective commentary, including recommendations for further work

This may be evidenced by reference to the student handbook for the capstone experience and is most easily confirmed through the provision of reports at the site visit.

I. The capstone experience should communicate the research outcomes appropriately and effectively

Capstone experiences should be presented in ways which clearly and effectively communicate the ideas to the intended audience.

J. The capstone experience should inculcate an appropriate understanding of health and safety good practice, an appreciation of ethical issues, and demonstrate an understanding of scientific integrity

The Society recognises that responsibility for health and safety, risk analysis and ethical approval lies with the institution. However, the student should have been involved in these processes as they apply to their capstone experience (e.g. by preparing a draft risk assessment or ethics application that can be submitted as assessed coursework or included in the capstone experience report).

2. Demonstration of the acquisition of technical skills and familiarity with the practical environment

The biosciences are a collection of subjects which require significant technical and practical training to demonstrate the key principles and develop problem solving approaches which use an experimental approach. Different areas have their own requirements: while recognising this diversity, the RSB seeks to ensure that all students learn in a hands-on, practical environment, and are trained in the technical skills appropriate to their main subject interest. Competency requires repeated learning and assessment of students' ability in these areas, whether working in a group or individually, and is a progressive process.

Guidelines

A. The University should have, and provide, a list of the core technical skills used in the laboratory and/or field, which form the foundation for the degree subject, and what would be deemed appropriate as a level of competency

A bespoke list may not be necessary if it is already present, for example in validation documentation or student handbooks. The Society will need to feel confident that the University is explicit about which technical skills are being acquired by its students and where they are assessed. If a bespoke summary for the submission is required then please follow the format of the table provided below. The table ideally should evidence a progressive approach, where basic techniques and skills are built on during the course of the programme.

Skill	Level 4	Level 5	Level 6
Aseptic technique	Introduced in module BIO40001	Developed in module BIO50001	Applied in microbiology capstone experience, module BIO60008
Etc.			

B. A description of how the technical skills are assessed

This can be briefly summarised in the submitted matrix. For example, "technical skills of individuals are assessed on a pass/fail basis by laboratory demonstrators during the series of practical classes in modules BIO40001, BIO40002", or any other appropriate approach. Universities may wish to discuss their approach with the Society who provide training courses for Society members on teaching, learning and assessment in the biosciences, and generate and share examples of good practice.

C. Evidence is provided of a basic competency in the core technical skills for all students on the programme

For example, through a record of the individual achievement of skills, or identification of compulsory learning outcomes. There must be evidence that students are trained and tested in the basic competencies, and achieve a threshold standard set by the University, and deemed appropriate say by employers. However, there is no requirement for all students to achieve a high level of competency in every technical skill. The Society is accrediting life science programmes, not professional training programmes.

D. The Society is specifically seeking evidence for the development of the appropriate technical skills in relation to the subject, whether in the field, the laboratory or the workplace

A system for recording the development of skills and experience of the practical environment should be present within the programme. There is no defined core list of competencies which must be achieved, due to the fact that any significant list would be rapidly out-of-date. However the very basic operations (sample and specimen handling, pipetting, manipulation of solutions, measurement, use of basic equipment, and the different forms of error) would be expected. Different subject areas will have different requirements, perhaps informed by the work of the relevant Learned Societies, which could be used as a basis for submission.

3. The development and use of transferable graduate skills

There should be clear evidence that students are given opportunities to develop and recognise a range of skills that enable them to consider/approach problems critically, confidently and independently.

Communication skills are considered in terms of communicating science to a range of audiences, and through both oral and written approaches.

The Society will seek evidence of an approach for the development of teams and different roles within teams (including leadership), and general management skills, including project management.

The Society will seek evidence that ethical and regulatory issues are appropriately addressed. While for many students this may be built on through the capstone experience, the underlying issues will need to be addressed for everyone.

Guidelines

Existing University documentation may show where graduate skills outcomes are taught and assessed. If this is not available, or felt by the applicant to be insufficiently clear for the purposes of accreditation, the submission should include a skills table as described in the guidance to criterion 2A above.

A. There is a system for the development of basic skills such as word processing, spreadsheets and presentation software

There should be clear evidence that students have acquired these essential basic skills.

B. Students should be able to demonstrate how to find and distinguish/evaluate/cite appropriately valid sources of scientific and other information online and offline

There should be evidence that students:

- are able to collect, sort and protect/backup personal online resources, including issues of intellectual property
- demonstrate competence in the use of reference management systems
- understand and avoid plagiarism and the importance of personal integrity
- make the most of social media opportunities for networking responsibly

C. Students are given the opportunity to develop, and recognise a range of skills that enable them to consider/approach problems critically, confidently and independently

The curriculum should show evidence of integration and reinforcement of problem solving skills throughout a degree programme. Institutions should provide evidence that there are opportunities for the development of these skills at all levels of degree programmes so that students graduate as creative and effective problem solvers.

Students should be encouraged (wherever appropriate) to:

- rephrase problems in their own words and be clear about what is being asked; divide a complex problem into smaller, more manageable steps
- re-formulate a problem, allowing for the identification of more than one solution
- ensure the answers/solutions to problems make sense/are feasible

Students should also be given the opportunity to solve open-ended problems where more than one solution is apparent from the outset (see criterion six for further consideration of creative approaches to problem solving).

Problem solving frameworks that can help define and clarify the nature of a problem, and identify a solution, may also be considered. These could include the 5Ws and 1H (Who, What, Where, When, Why, How) tool and the Osborn-Parnes Creative Problem Solving Process. Institutions may wish to make use of these frameworks when developing students' problem solving skills.

D. Communication skills are considered in terms of communicating science to a range of audiences, and through both oral and written approaches

Institutions should provide evidence that they enable students to communicate effectively through oral and written presentations. This could be formally in the programme and less formally through outreach or presentations to (for instance) student-led societies.

E. There is evidence of an approach to the development of teams and different roles within teams (including leadership)

Teamwork can be particularly valuable with diverse teams, where each member may have a different background and therefore a distinct perspective on problems to be solved. Providing a curriculum framework in which teamwork and leadership skills are developed is a vital recognition of their importance.

F. There is an approach to general management skills, including project management

There should be reference to these skills in learning outcomes of specified modules. This framework should include the development of time management, organisation and interpersonal skills, including the use of milestones.

G. Ethical and regulatory issues are appropriately addressed

Student exposure to and understanding of ethical issues regarding experimentation and its regulation, provides the necessary appreciation needed for certain types of research, particularly those dealing with animals and humans. The study of ethics helps students to develop widely applicable skills in communication, reasoning and reflection, as well as an introduction to codes of conduct and work as a professional scientist. As stated in criterion one, Universities need to be clear about the difference between the institution's responsibilities in securing ethical approval and meeting legal requirements around health and safety and the learning, teaching and assessment of students' knowledge of these aspects within a programme.

4. A foundation in mathematics, statistics, chemistry and physics within a biological context appropriate to the discipline

At a basic level, all bioscience degrees should integrate mathematics, statistics, chemistry and physics to the extent that knowledge and understanding of science principles governing current techniques and concepts should be embedded within the curriculum. The knowledge and understanding of mathematical principles that support the application of key biological concepts must be sufficient to promote problem solving at the theoretical and practical levels. Students should be equipped with the mathematics needed to handle variation at different levels, especially with regard to the greatly increased amount of data being generated by modern laboratory and computing techniques. Students should understand the statistical aspects of experimental procedures, encompassing the analysis of collected data, the design and analysis of studies, the development of calibration and analysis techniques, and the robustness of data.

Guidelines

A. The coverage of mathematics, statistics, chemistry and physics should be of sufficient depth and breadth to provide the necessary knowledge and understanding for students to appreciate and apply these subjects within a biological context

Contextual understanding should be demonstrated through the integration of these physical sciences with the biological curriculum, as appropriate. It is to be expected that this coverage will vary within the biological disciplines. The curriculum should highlight, via learning outcomes, where interdisciplinary science knowledge and understanding is fundamental to future developments within specific fields.

B. Knowledge and understanding of science principles governing current techniques and concepts, and their evolution, are embedded within the curriculum

The biological sciences sit on a foundation of physical and mathematical sciences. It is appropriate that the integration of mathematics, chemistry and physics be taught within a biological context. In this way these subjects can be embedded within the curriculum as part of the learning developmental cycle that is relevant to specific bioscience disciplines. The use of molecular techniques in all areas of biology necessitates the need for chemistry to be included in the curriculum of all bioscience degrees. The extent to which this is covered will depend upon the discipline. However, a bioscience graduate should be able to prepare solutions at known concentrations, understand the concepts of molar, molarity and molality, and manipulate solutions, as well as understand the nature and application of buffers. Different specialisms may vary in the underpinning of mathematics, statistics, chemistry and physics at the technical and analytic skills levels. For instance, the treatment of descriptive and analytical statistics may vary between the molecular and the ecological and environmental sciences streams. A greater underpinning of physics might be deemed necessary for disciplines within the molecular stream where the biological applications of synchrotron radiation, x-ray crystallography or other physical science techniques are covered.

C. The knowledge and understanding of mathematical principles that support the application of key biological concepts are sufficient to promote problem solving at the theoretical and practical levels

Provide an overview.

D. Students should be equipped with the mathematics needed to handle variation at different levels

Provide an overview of the statistics learning outcomes.

E. Students should understand the statistical aspects of experimental procedures, encompassing the analysis of collected data, the design and analysis of studies, the development of calibration and analysis techniques, and the robustness of data

Show how students apply statistics in experimental situations. Section D above is concerned with how students learn the mathematical principles, this section, E, is about how that knowledge is applied in experimental situations.

5. Specific skills and knowledge appropriate to the degree title

Bioscience degree programmes may involve a great deal of specialisation, particularly, but not only, in the final year. All bioscience graduates from a Society accredited degree in any area of specialism should have some underpinning general knowledge of the fundamentals of biology. This includes an overview of biodiversity, the cell, basic genetics, the concept of evolution, biochemistry and molecular biology, and organismal biology.

The specialist degrees are likely to fall into one of the following categories: molecular aspects of biology (including biochemistry); organismal biology (including botany and zoology); ecology and environmental biology; and human biology. Universities, in their documentation will provide details of the specialist curriculum. Reference will be made to Learned Societies where relevant.

Guidelines

A. All bioscience graduates in any area should have some basic knowledge of genetics, biochemistry, molecular biology, and organismal biology

The Society feels that it is essential that graduates from an accredited degree not only have an overview that helps them understand their chosen field of study, but that they can “hold their own” in terms of basic biological knowledge in the context of overall public awareness. The topics forming the fundamentals of biology provide the underpinning context to the specialisation. The Society accepts that they may be explored to a greater or lesser extent according to specialisation of the degree and it may be appropriate that some of the core topics be mainly taught at European Qualification Framework (EQF) level 8.

B. There has been consultation with the appropriate Learned Society for the specific skills and knowledge that may be required for a specific programme name

Many honours degrees are awarded in subjects that have relevant Learned Societies. Universities should consult with the appropriate Learned Societies for the specific skills and knowledge that may be required for a specific programme name.

C. The programme adheres to the guidance for the Typical Standard of the Biosciences Benchmark

The Society recognises general areas (e.g. Molecular Aspects of Biology, Whole Organism Biology, Ecological and Environmental Sciences). The key topics within these degrees are outlined in the Quality Assurance Agency Biosciences Benchmark Statement and are not repeated here. Accredited programmes will be expected to adhere to the guidance for the typical standard of the most current Benchmark Statements (available at www.qaa.ac.uk/quality-code/subject-benchmark-statements#).

6. Developing creativity and innovation

Developing creativity and innovation in graduates should be an implicit part of the student experience. These characteristics will serve graduates well, wherever they plan to make their careers. The Society recognises that in some respects, we are only at the beginning of this kind of curriculum development. Hence, the accreditation process seeks to encourage the development of these characteristics rather than necessarily insisting on evidence of them as a prerequisite for accreditation. The Society accepts that this is a developing theme in many institutions and not necessarily a learning outcome met by every graduate.

Institutions should provide evidence that they encourage students to be creative by thinking differently and they should describe the steps they have taken towards providing an environment that promotes creativity and innovation. Universities should also make it clear how they promote problem solving using techniques designed to develop individual and group creativity.

Guidelines

The development of creativity and innovation within the curriculum for an accredited degree programme could contain some or all of the following elements.

A. Institutions should provide evidence that they encourage students to be creative by 'thinking differently'

Universities should provide evidence that they promote a creative mind set in students by encouraging them to think differently. Students should be encouraged to:

- be inquisitive and open-minded
- welcome the unexpected
- challenge assumptions and (from time-to-time) defy convention
- think beyond their own discipline and make interdisciplinary connections
- consider problems from the perspective of non-biologists

B. Universities should describe steps that they have taken towards providing an environment that promotes creativity and innovation

There should be evidence that institutions provide the time and space for students to think creatively. This should involve the creation of a culture, ideally at all levels of degree programmes, in which creativity is stimulated and innovation thrives. Important elements of this culture include:

- the encouragement of 'off the wall' ideas, that may lead to genuinely creative solutions to problems
- the building of confidence in students so they have the courage and conviction to pursue their ideas to fruition

C. Engagement of students with techniques that can promote individual and group creativity

Universities should make it clear how they promote creativity and creative problem solving, using techniques designed to develop individual and group creativity. For group sessions there should be evidence that institutions offer structured, constructive and inclusive approaches to creative problem solving. Where these activities are assessed, emphasis should be placed on students demonstrating how they have engaged with techniques designed to promote creativity in individuals, and the extent of their participation in group sessions. As an example for the former, students could be asked, for example, how they have utilised a specific technique during creative problem solving. Students should not be awarded marks solely on the basis of coming up with novel ideas, as this is frequently an unrealistic expectation.

Advanced accreditation

Advanced accreditation by the RSB recognises academic excellence in the biosciences, highlighting degrees which contain a significant research element and educate the research and development leaders and innovators of the future. The advanced accreditation criteria require institutions to provide evidence that their graduates meet defined sets of learning outcomes, including gaining substantial research experience.

Through the process of advanced accreditation, universities will reflect on the needs of their learners in preparing them for key research positions within the biosciences. Advanced accreditation will also enable the sharing of good practice across the sector, thus driving up the standard of graduates in the specific biological and life sciences.

Advanced accreditation is not about wide recognition of threshold standards, nor does it seek to make judgements on the wide range of excellent degrees delivered in higher education. Rather, it seeks to identify and recognise programmes that deliver the research and development leaders and innovators of the future.

Degree programmes recognised for advanced accreditation by the RSB are likely to be those that:

Enhance leadership and reward innovation

Successful degree programmes will equip students with the skills to become leaders and innovators in research and development. For this reason, the research environment in which this learning takes place is a key consideration of the accreditation process, as is the learning and teaching environment.

Develop independent research skills

Degree programmes gaining advanced accredited status will bestow independent research capabilities upon their graduates. A period of practice will allow the student to apply the knowledge and learning gained in their academic training, while carrying out their own supervised research in an active research environment. The research will be related to, and draw on, the theoretical knowledge and skills already acquired. During this period, students will become fully integrated into the research environment and become more independent thinkers.

Deliver excellence

Advanced accredited degree programmes will be highly regarded within the learning and teaching community, the research community, and by employers. Such programmes will be delivered by subject experts and produce graduates with the potential to excel in a career in their chosen field.

Advanced accreditation recognises three facets of a particular programme:

1. A base of knowledge, understanding, skills and excellence as defined by the RSB, which provides the framework and standards for accreditation
2. Specific knowledge, understanding and skills for routes identified by the intended learning outcomes, and defined in partnership between the RSB, relevant Learned Societies, and other partners
3. A sizeable research element, which provides the opportunity to develop skills in a range of research techniques and experience of planning and undertaking at least one substantial research project

All documents linked to Advanced Accreditation can be found at www.rsb.org.uk/education/accreditation/International-Degree-Accreditation-Important-Documents.

Criteria for advanced accreditation

To achieve advanced accreditation for a programme, Universities will need to provide robust evidence of excellence in support of their application, which will be judged by peer review against the standard metrics listed below. The evidence for (A) and (D) should show either:

- How the appropriate intended learning outcomes are being achieved through the approach to assessment at the appropriate level
- How achievement of these outcomes is ensured upon entry to the programme

A. Academic excellence

- i. Knowledge and understanding of the subject informed by current scholarship and research
- ii. Proven practical expertise in the laboratory, field and elsewhere appropriate for the main research project
- iii. Knowledge and understanding of research methodology
- iv. Appropriate and clear assessment criteria

B. Research-active environment, as evidenced by:

- i. An appropriate breadth in the area being offered for accreditation
- ii. Appropriately high quality research, as defined by national and international criteria
- iii. The provision of projects in research-active laboratories
- iv. Achievement of the period of practice learning outcomes

C. The infrastructure supporting the claim for excellence, including:

- i. Access to, and standards of, library and information and communications technology
- ii. Learning and teaching environments and research laboratories and facilities
- iii. Experience and expertise of teaching team
- iv. Processes to support monitoring achievement throughout, including processes for approving progression to higher levels
- v. A track record of success for the programme's graduates in research in industry or higher education

D. Other student outcomes, requiring evidence of the means by which students are brought to the level needed to support their particular specialism

- i. Appropriate levels of knowledge and understanding in physics, chemistry and maths in a biological context
- ii. The ability to study independently
- iii. Experience of using a range of techniques and research methods in a safe and responsible manner
- iv. An analytical, problem-solving approach to their work and the ability to critically evaluate evidence
- v. An understanding of research study design
- vi. Provision of necessary and appropriate research facilities and equipment
- vii. Effective communication through a variety of media, to specialist and non-specialist audiences
- viii. An appreciation of the significance of ethical, social and legal issues and critical awareness of current developments in the subject

Period of practice

For an advanced accredited degree programme the student period of practice must be an evaluated working experience in an appropriate environment.

Inclusion of a period of practice, outside the normal learning environment, in a professional working structure will enhance the students' experience and should be considered normal practice for advanced accredited degree programmes. The clear objective, therefore, is to augment and develop the skills and competencies delivered by the degree programme, and to practice science in a working context. The period of practice is also a valuable experience for employers as it provides an opportunity for staff to interact with young scientists at a formative stage of their career, as well as offering supervisory or mentoring experience as part of career development.

Periods of practice in advanced accredited degree programmes should have the following outcomes:

1. A period of practice will allow the student to apply the knowledge and learning gained in their academic training while carrying out their own supervised research in an active research environment
2. The research will be related to, and draw on, the theoretical knowledge and skills already acquired during the degree programme

Factors that define appropriate periods of practice

It is expected that the student will gain scientific and interpersonal skills, which complement the learning experience delivered by their sponsoring University. Periods of practice will therefore contribute to the overall objective of identification and training of talented students interested in careers as practicing scientists.

Appropriate locations for periods of practice

There are significant opportunities for student periods of practice in universities, hospitals, other public institutions and the private sector, nationally and internationally. The University responsible for the student must ensure that the location of the period of practice provides a suitable environment for that student (i.e. safe, appropriate, and able to support the development needs of the individual concerned).

Small and medium-sized enterprises (SMEs) and contract research organisations (CROs) are currently under-used as hosts for the period of research training. The Society encourages Universities to consider these institutions but the University must ensure that the host SME or CRO can support the project, provide sufficiently challenging research topics and adequate supervision.

Common format

There are a number of common elements, which should be included in the process regardless of subject or location. These are:

1. The effort required by the student for the research component of this work would normally be the equivalent of at least 800 hours of work, and assessed at the appropriate level
2. The assessment of the period of practice will include a written report and other evidence (e.g. a self-reflective report, or oral examination) to show achievement of the learning outcomes
3. The student should receive significant contact from the sponsoring University, such as a site visit or teleconference if the period of practice is carried out elsewhere other than the sponsoring University
4. Passing the period of practice must be a requirement for award of the degree

Placements and assessment

The RSBs Advanced Accreditation Assessment Panel must see evidence of the common elements described above, as well as a clear account of the discipline-specific learning and skills required within any subject. Universities must justify their calculation of equivalent credits and illustrate how they assess outcomes one and two to the assessors in their stage one application. There will be flexibility for exceptional circumstances at the discretion of the Panel.

Master's accreditation

Master's degree accreditation by the RSB highlights degrees which support the development of specific skill sets, competencies and training which will enhance Life and Health Science research. The master's degree criteria require universities to provide evidence that their graduates meet defined sets of learning outcomes, including gaining substantial research experience.

The RSB will accredit 180 credit, or equivalent, Master's level programmes in the Life and Health Sciences, provided as full-time or part-time qualifications. Programmes submitted for accreditation must satisfy the general requirements for Advanced Accreditation³, which includes a significant period of practice.

Master's qualifications mix specialisation with advanced level (level 7 [QCF/QCFW/EQF]) learning and practice. The Society recognises that this should lead to a wide range of pedagogic approaches, and offers these examples as extremes of a normal distribution – there is no 'right' way to deliver an accredited programme, only a set of outcomes which should be achieved.

Full time 180 credit or equivalent programmes, taken over a 12 month period, must include a period of research practice in an environment appropriate to the subject of the Master's programme – many of the core requirements will have been recognised in the admissions process to the Master's programme. Part time 180 credit or equivalent programmes, taken over a longer period as part of employment in a Life and Health Sciences industry, such as the Health Service, are likely to have a less clearly defined project (in terms of credit equivalents), strongly embedded in the workplace. The aims remain the same (see below), and the judgement of excellence remains a peer review judgement by an appropriate panel of experts, using the accreditation framework as the basis for the judgement.

There are many reasons why a Master's-level course might have been designed, ranging from fundamental research training to the directed education of researchers in industrially-focused topics or to the creation of specifically trained researchers in a highly specialised field. It is requested that when learning outcomes have been designed to align with or fulfil a particular need, the University clearly explain this link so that the review panel can accurately assess the success of the course in delivering its stated objectives. This could include, for example, the expectations of employers, learned societies or other similar sponsor or stakeholder.

All documents linked to Master's Accreditation can be found at www.rsb.org.uk/education/accreditation/International-Degree-Accreditation-Important-Documents.

³ Please refer to the Advanced Accreditation section of this handbook

Criteria for master's degree accreditation

To achieve master's degree accreditation for a programme, universities will need to provide robust evidence of excellence in support of their application, which will be judged by peer review against the standard metrics listed below. The evidence for (A) and (E) should show how the appropriate intended learning outcomes are being achieved through appropriate assessment strategies.

A. Does the documentation indicate that the programme incorporates academic excellence within the teaching programme supporting a structured learning opportunity? Does documentation provide evidence of academic excellence:

- i. Knowledge and understanding of the specialist subject informed by current scholarship and research
- ii. Proven practical expertise in the laboratory, field and elsewhere appropriate for the main research project
- iii. Knowledge and understanding of research methodology
- iv. A critical awareness of current issues and developments in the subject area
- v. Completion of an extended research project in the subject area, including a clear demonstration of critical analysis
- vi. Communication of the research outcomes appropriately and effectively
- vii. Appropriate and clear assessment criteria, mapped to the learning outcomes
- viii. Specialisation in a subject area that supports the development of specific skills

B. Research-active environment, as evidenced by:

- i. An appropriate breadth in the area being offered for accreditation
- ii. Research excellence, as defined by appropriate national and international criteria
- iii. Appropriate training in research methodology and techniques and assessment
- iv. The provision of projects in research-active environments, where the effort required by the student for the research component of this work would normally be the equivalent of at least 80 credits, of which at least 60 credits should be accounted for by the project

C. Does the documentation provide evidence of an infrastructure supporting the incorporation of excellence within the teaching programme? This will include:

- i. Access to, and standards of, library and information and communications technology
- ii. Learning and teaching environments and research laboratories and facilities
- iii. Experience and expertise of teaching team
- iv. Processes to support monitoring achievement throughout, including process of approving progression to higher levels
- v. A track record of success for the programme's graduates in research in industry or higher education
- vi. Provision of necessary and appropriate research facilities and equipment
- vii. There is an approach to general management skills, including project management
- viii. Ethical, health and safety and regulatory issues are appropriately addressed

D. Does the documentation provide evidence of generic and specific skill acquisition appropriate to the degree title? This will include:

- i. Appropriate levels of knowledge and understanding in physics, chemistry and mathematics necessary to apply advanced bioscience techniques related to the subject area
- ii. The ability to study independently
- iii. Experience of using a range of techniques and research methods in a safe and responsible manner
- iv. An analytical, problem-solving approach to their work and the ability to critically evaluate evidence
- v. An understanding of research design
- vi. Effective communication through a variety of media, to non-specialist audiences
- vii. An appreciation for the significance of ethical, social and legal issues and critical awareness of current developments in the subject
- viii. Prepare the student for a future career
- ix. There is evidence of an approach to the development of teams and different team members (including leadership)
- x. Students should understand the statistical aspects of experimental procedures, encompassing the analysis of collected data, the design and analysis of studies, the development of calibration and analysis techniques, and the robustness of data
- xi. Awareness of data banks and analysis of large data sets
- xii. Health and safety training in the laboratory/field

E. The period of practice is that part of the course concerned with a research project completed in a work environment – it is where the student experiences the practice of science. The nature of the research may be experimental, where it is performed in a laboratory, or computational linked to bioinformatics, or it may be more related to bio-enterprise. It is expected that the research will generate information that can be critically evaluated. The work environment may be a research laboratory within an academic institute or at an industrial or commercial company, or in a designated research area such as a specific field location or aboard a research ship. For accreditation, when the student is working away from the home institution, it is important that the mechanisms for monitoring student progress be clearly described.

- i. A period of practice will allow the student to apply the knowledge and learning gained in their academic training while carrying out their own supervised research in an active research environment
- ii. The research will be related to, and draw on, the theoretical knowledge and skills already acquired during the degree programme
- iii. The student effort should be substantial (equivalent to 60 credits or more for a research-based course), and evidence of achieving the learning outcomes should be clearly documented against the produced written work
- iv. Throughout the period of practice, the interaction of the student with the supervisor should be documented allowing progress to be clearly monitored
- v. The period of practice should be passed for the award of the degree

All supporting documentation including the master's degree accreditation formal expression of interest form and template evidence matrix can be found on the Society's website

www.rsb.org.uk/education/accreditation/International-Degree-Accreditation-Important-Documents.

Appendix A – Process of applying for accreditation

Universities should first indicate their interest in seeking accreditation by contacting the Accreditation Team at accreditation@rsb.org.uk. Following initial conversations, the University will be required to complete and submit a formal expression of interest form, which can be downloaded from our website: www.rsb.org.uk/education/accreditation/International-Degree-Accreditation-Important-Documents.

Once a site visit date has been agreed, a suitable document submission date shall be arranged (usually 8 weeks before the site visit). Documentation for the stage one review should be submitted to the Accreditation Team by 17:00 on the specified date. For guidance, please contact the Accreditation Team by emailing accreditation@rsb.org.uk.

The following documents should be submitted electronically to the Royal Society of Biology:

1. Letter of intent

This should summarise how the programme meets the criteria for accreditation and characteristics of an accredited programme (see advice below). Only one letter of intent is required per application, and must refer to all programmes seeking accreditation.

The letter of intent must include:

- a list of the degree titles for which accreditation is sought
- a brief summary of the structure of the degrees and any options
- a declaration of any articulation agreements if appropriate
- the numbers of students enrolled on each degree programme
- date of the last periodic review
- paragraphs summarising how the programme(s) meet each of the criteria
- a brief explanation of how the submitted evidence is organised (e.g. a list of folders and their contents, this can be provided as a separate paper attached to the letter of intent if desired)

2. Completed accreditation matrix

3. Table of technical skills

4. Programme specifications

5. Programme details, including:

- programme structure including optional routes (where only a specific route or pathway within the core degree programme will meet the accreditation criteria, the University should ensure that this is made clear)
- knowledge and skills learning outcomes
- list of acronyms and definitions used by the University
- the learning, teaching and assessment strategy
- student handbook(s)

International applications should include a general description of the structure of degrees for their institution, i.e. if using credit hours, how many hours do the different forms of teaching equate to; how many credits are prescribed as general or specialist; any other requirements for graduation.

6. Module (or unit) descriptors and handbooks
7. Resource documents:
 - an overview of the facilities available at the University relating to the programme
 - brief résumés (or equivalent) for the programme leader(s) and key academic staff involved in the programme
8. Appropriate internal and/or external reviews and reports
9. Details of procedures and processes adopted within the University, for consideration and approval of ethical issues and Home Office Licences (or equivalent), as relevant to the programme submitted for accreditation. Evidence of student exposure to and understanding of these processes
10. Destination data for recent graduates of the programme
11. Most recent summative assessments (e.g. examination papers, etc.); coursework assessments may be listed and/or described in student handbooks (item 5) or module descriptors (item 6), if so they need not be sent as a separate file

Where internal programme reviews contain the required information (i.e. items 4 to 11), it is perfectly acceptable to submit these.

Wherever possible, online access to the University's e-learning facilities should be made available to the Accreditation Assessment Panel.

Accreditation matrix

All applying Universities must complete at least one accreditation matrix. For a complex and broad set of programmes the University may consider it easier to present a matrix for each set of related awards, however, this should be discussed with the Accreditation Team in the first instance. If existing documentation does not summarise where skills are taught and assessed additional tables as appendices to the matrix should be supplied.

For ease of reference, the matrix is based on the criteria and closely follows the template for the Stage One Report used by assessors.

A template for the matrix can be found at www.rsb.org.uk/education/accreditation/International-Degree-Accreditation-Important-Documents.

Appendix B – Subject specific learning outcomes

In addition to the core learning outcomes specified for each accreditation type, specific outcomes have been developed by Learned Societies across the key areas of the biosciences for specific skills and knowledge, appropriate to specific degree titles.

Degrees using 'Biochemistry' in their title

The Biochemical Society suggests that the graduates of a biochemistry degree programme should be able to:

- demonstrate an understanding of the chemistry, structure and function of biological molecules
- explain biological mechanisms, such as the processes and control of bioenergetics and metabolism, as chemical reactions
- explain the biochemical processes that underlie the relationship between genotype and phenotype
- demonstrate an understanding of the structure and function of both prokaryotic and eukaryotic cells (including the molecular basis and role of subcellular compartmentalisation)
- apply laboratory-orientated numerical calculations (e.g. inter-conversion of masses, moles, and molarity, preparation of solutions and accurate dilutions)
- be capable in data visualization and analysis, including the application of data transformations (e.g. logarithmic, exponential)
- demonstrate an understanding of the principles, and have practical experience of, a wide range of biochemical techniques (e.g. basic molecular biology, cell biology and microbiology methods, spectrophotometry, the use of standards for quantification, enzyme kinetics; macromolecular purification, chromatography and electrophoresis)
- analyse biochemical data (e.g. in enzyme kinetics, molecular structure analysis and biological databases)

The following further subject specific guidance provides advice on chemistry within Biochemistry degrees:

- a) Biochemistry degrees require a higher level of chemistry content than many/most other biological science degrees:
'A solid foundation in chemistry is essential for any Biochemistry degree programme. Relevant aspects of chemistry beyond that included in A-level courses should be taught, ideally early on within the degree programme, so that these principles can be related to key biochemical concepts. More advanced biological chemistry topics might also require the inclusion of chemistry material later on within the biochemistry degree, once the fundamentals have been covered.'
- b) The aim of the core material in chemistry is to provide the student with sufficient knowledge of the basics of chemistry (physical, analytical, bioinorganic and organic) to be able to study and understand the subject of biochemistry.
The content should include a sensible grounding in the following topics, not necessarily all embedded within chemistry specific modules/courses:
 - Atomic and molecular structure (including bonding and stereochemistry); non-covalent interactions
 - Thermodynamics, particularly of solutions, including electrochemistry
 - Organic mechanisms and functional-group organic chemistry
 - Chemical reaction kinetics
 - Analytical methods e.g., UV-Vis., IR spectroscopy, NMR, MS
 - Bio-inorganic chemistry (i.e. the importance of metals in biology)
 - Practical experience of analytical approaches, including different types of spectroscopy

Degrees using 'Ecology' in their title

The British Ecological Society suggests that the graduates of an ecology degree programme should be able to:

- demonstrate practical fieldwork skills (e.g. ecological survey techniques, species identification and ecological impact assessments)
- demonstrate an understanding of key ecological interactions and processes: the distribution and abundance of organisms, the interactions among organisms, the interaction between organisms and their environment, and the structure and function of ecosystems
- explain scales and patterns in ecology and biodiversity (e.g. individual to biosphere, landscape ecology, geographic and global ecology)
- appreciate the relationships between ecology and society (e.g. science into policy, conservation ecology, biodiversity conservation, natural resource capital, ecosystem services)

Degrees using 'Microbiology' in their title

The Society for Applied Microbiology suggests that the graduates of a microbiology degree programme should be able to:

- analyse and manipulate microorganisms under appropriate containment conditions
- apply aseptic technique for isolation, culture, enumeration and safe disposal of microorganisms
- characterise and identify microorganisms using a wide variety of systematic techniques (including those based on physiology, biochemistry, chemosystematics and molecular biology)
- analyse the interaction of microbes with their environment, including other microflora
- explain the application of microbiology, and its contribution to solving global challenges facing humanity (including infection control, food security, energy supply and climate change)

Degrees using 'Pharmacology' in their title

The British Pharmacological Society suggests that the graduates of a pharmacology degree programme should be able to:

- construct and analyse drug concentration/dose-response relationships using living tissues or model systems with knowledge of the pharmacologist's role in developing in vitro and in vivo models in which drug action can be tested
- evaluate the action of drugs in whole organisms, living tissues, and/or model systems using a variety of pharmacological techniques (e.g. bioassays, receptor binding, receptor cloning, recombinant proteins for therapy, animal models of disease, genetic manipulation of cells and animals and their uses)
- apply principles of pharmacokinetics using living tissues, model systems or simulations (e.g. pharmacokinetic modelling software) and demonstrate numeracy in pharmacological calculations (e.g. drug concentration, loading dose, therapeutic index)
- explain how advances in pharmacology (e.g. small molecular inhibitors, antisense therapy, biopharmaceuticals, pharmacogenomics, novel drug delivery systems) can contribute to improving human and animal health including the development of personalised therapies

These learning outcomes could be achieved through the following:

www.bps.ac.uk/education-engagement/teaching-pharmacology/core-curricula/undergraduate-pharmacology-core-curriculum

For Pharmacology degrees where students are taught about, carry out research, analyse literature or use data generated from studies involving research animals please also refer to the additional guidance in the 'Research animal sciences' section.

Degrees using 'Physiology' in their title

The Physiological Society suggests that the graduates of a physiology degree programme should possess the following subject specific skills and knowledge:

- describe and explain the relationship between the molecular, cellular and tissue structure of each body system and relate this to their different functions and physiological roles in health and disease
- explain the concept and importance of maintaining physiological homeostasis at the cellular, system and organismal level, and the consequences of homeostatic imbalance in disease
- describe how cells communicate with each other, the concepts of positive and negative feedback between cells, and the importance of these processes in the maintenance of physiological homeostasis
- explain the principles of collecting physiological data, and apply practical skills in either human or animal models both in vivo (e.g. ECG, spirometry, nerve conduction) and ex vivo (e.g. isolated tissue experiments, cell culture, haemolysis assays, molecular biology techniques)
- analyse physiological data (e.g. electrophysiological signals, fluorescence images) using appropriate data handling and statistical methods, and demonstrate an awareness of the ethical and legal issues that relate to collecting physiological data from human and animal subjects

For Physiology degrees where students are taught about, carry out research, analyse literature or use data generated from studies involving research animals please also refer to the additional guidance in the 'Research animal sciences' section below.

Research animal sciences specific learning outcomes

Degrees where students are taught about, carry out research, analyse literature or use data generated from studies involving research animals.

The British Pharmacological Society, in discussion with a range of stakeholders⁴, define "Studies involving research animals" as studies where the involvement of animals is subject to legislation, regulation, or national standard, for example, in the United Kingdom, studies regulated by the Animals (Scientific Procedures) Act 1986. They suggest that graduates of such degree programmes or courses should be able to:

- demonstrate knowledge and understanding of the scientific use of research animals
- demonstrate knowledge and understanding of the regulatory, ethical & welfare issues surrounding the use of research animals
- analyse and critique literature and/or data that has been generated from studies involving research animals

These learning outcomes could be achieved through the following:

<https://www.bps.ac.uk/education-engagement/research-animals/curriculum-for-the-use-of-research-animals>

Further Guidance

Unlike many of the subject-specific skills and knowledge criteria, it is unlikely that entire degree programmes are devoted to this topic, rather students will acquire knowledge, skills and understanding of the discipline in specific modules or courses (or elements of these) encompassing, but not limited to: animal welfare; ethics; law; animal physiology and pathophysiology; the use of research animals to better understand physiology, disease processes, in drug development, to fulfil regulatory obligations, and in translational studies; experimental design; data analysis and interpretation; experimental procedures and techniques involving research animals. This knowledge, skills and understanding could also be acquired in capstone research projects or experiences.

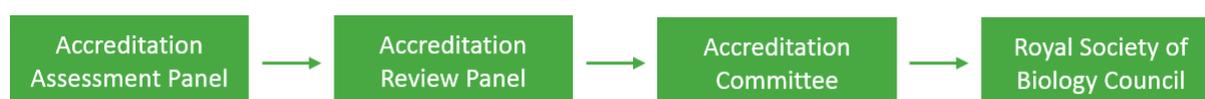
The modules or courses could form part of many different undergraduate and Taught Masters degree programmes including (but not limited to): Animal Physiology and Nutrition; Animal Sciences; Behavioural Sciences; Biology; Degree programmes in the Biomedical, Medical or Life Sciences; Psychology; Toxicology; Zoology.

⁴ The British Pharmacological Society, British Association of Psychopharmacology, British Toxicology Society, Chinese National Pharmacological Society, International Union of Basic and Clinical Pharmacology, Laboratory Animal Science Association, Physiological Society and the Safety Pharmacology Society, among others.

Appendix C – Assessment panel membership and guidelines

The Accreditation Assessment Panel considers the evidence submitted by universities through an initial application and site visit and provides a recommendation to the Accreditation Review Panel (a subcommittee of the Accreditation Committee) as to whether the degree programme(s) should be accredited. The decision approval process is shown in Figure 2 below. The assessment is not simply a tick-box exercise and requires academic judgement.

Figure 2 – Decision Approval Process



A Panel will include a panel Chair with experience of chairing, approvals, and quality assurance, and at least one other panel member. Panel members are selected based on their experience and subject area expertise. The RSB provides training for panel members, administrative support, and a panel secretary for the site visit.

The size and composition of a Panel may depend on the type of programme(s) being accredited. Members of the Panel are expected to be up to date with current practice in higher education with a focus on quality assurance, programme design and content.

Members of the Accreditation Assessment Panel are expected to:

- Complete a comprehensive online distance training course
- Read all initial documentation submitted by the applying University and work with the Chair to complete the Stage One Report
- Take part in a pre-meeting with other panel members
- Attend a stage two site visit to the applying University
- Work with the panel Chair to draft a Stage Two Report for submission to the Accreditation Review Panel

Members of the Accreditation Assessment Panel must abide by the Royal Society of Biology Code of Conduct and declare, prior to the start of the accreditation process, any potential conflicts of interest with the degree programme being accredited.

Conflicts of interest

Members of the Panel must not have worked for, or acted as an external examiner for, the University being assessed in the last five years. Members of the Panel are expected to (and will be given the opportunity to) declare any previous working relationships with the University that would prevent them assessing a particular application.

Code of Conduct

In the course of conducting accreditation assessments for the RSB, the Panel may come in contact with individually identifiable, commercially sensitive and/or confidential information. Panel members must treat all information received or obtained while performing any duties on behalf of the RSB as confidential and not divulge such information to any other person or organisation unless authorised to do so. This responsibility continues after the assessment has concluded.

In order to ensure that universities, the scientific community, and the wider public may have confidence in the effectiveness and impartiality of the RSB's Degree Accreditation Programme, members of the Panel must undertake to:

- Inform the RSB of any potential conflicts of interest as soon as possible
- Not use their position as a member of the Panel to promote their personal, professional or business interests
- Respect the confidentiality of information acquired to them solely by virtue of their position as a member of the Panel and not discuss any specific aspects of an ongoing accreditation application with anyone working/studying at, or associated with, the University being accredited or any other unauthorised person
- Attend all meetings at which their presence is required
- Prepare for meetings by reading all papers issued beforehand
- Direct relevant questions about an accreditation event to the RSB
- Be fair, open-minded, unbiased and non-prejudicial on grounds of gender, race, disability, lifestyle, culture, beliefs, sexuality, age or any other irrelevant ground and not use any language that could be deemed offensive or discriminatory
- Not request or accept any inducement, gift, commission, discount or any other profit from the University being assessed or from any other interested person

Adhering to this Code of Conduct is a minimum expectation of all members of the Royal Society of Biology Accreditation Assessment Panel. The RSB reserves the right to revoke membership of the Panel if any panel member does not abide by this Code of Conduct.

The Panel will be covered by public liability and/or indemnity insurance for committee members held by the Society whilst carrying out assessments.

Appendix D – Guidance for the site visit

Before the site visit

The University will book accommodation including breakfast for the Panel members in a suitable nearby hotel. If necessary, the University should also arrange transport for the Panel to the venue for 09:00 on the mornings of the visit.

Days of site visit

The example agenda and guidance provided below are flexible and subject to change, depending on individual circumstances. All times given are approximate. A conference room, large enough for all meetings, with tea, coffee and water, set out in boardroom style should be provided. Student project reports and any additional documentation requested should be made available for viewing.

Day 1

09:00 – 11:00

Private meeting of Assessment Panel

A private room should be provided for this meeting. During this time, student project reports and any additional documentation requested should be made available for viewing by the Panel.

11:00 – 13:00

Introductions and presentation by Programme Team

The University should prepare a presentation of no longer than 30 minutes duration on the degree programme(s) being submitted for accreditation, preferably given by the programme leader. This should describe any unique or particularly valuable features of the programme(s) and provide details of any optional pathways. The presentation should not attempt to answer any of the questions arising from the Stage One report.

13:00 – 15:00

Lunch and meeting with students

The University should provide a light lunch for the Panel and the students in a suitable venue. The University should issue an invitation to students and recent graduates to speak to the Panel about their learning experiences. The Panel ask that a selection of 10-20 student representatives across all years of the programme should attend, including, if possible, recent graduates.

15:00 – 17:00

Tour of facilities

A tour should be arranged to give the Panel a chance to see laboratories and other facilities available to students on the programme(s) being considered. This should concentrate on facilities integral to learning and teaching for students on the programme(s) being assessed.

The Panel may request to see particular laboratories or facilities and advance notice will be given if this is the case. Where visits to particular facilities that may have restricted access are required, the University is kindly asked to arrange this in advance. The timing of this stage of the visit is flexible to ensure that the labs will be in use during the tour of the facilities. Please alert the RSB if this is not a suitable time for the tour.

17:00 – 17:30

Private meeting of Assessment Panel

17:30

End of day 1

Day 2**09:00 – 10:30****Private meeting of Panel**

A private meeting room should be provided. The Panel may require that additional documentation is made available during this meeting. Therefore, the contact details of a member of staff, who will be available to assist, should be provided.

10:30 – 12:00**Meeting with Programme Team**

The Panel will meet with up to 10 key individuals from the Programme Team. The Panel may request particular individuals to be present, and the programme leader, placement co-ordinator and assessment officer (or equivalent) should all be present. The University should provide name boards including job titles for all attendees of this meeting.

The Panel will discuss aspects arising from the Stage One Report. Normally this report will set the agenda for the meeting; however, it is possible that topics may arise from the presentation or any documentation submitted after receipt of the Stage One Report. The programme team will have the opportunity to respond and provide further evidence. The programme team may wish to explain how they have addressed, or plan to address, any issues or to query the Panel's interpretation of the evidence provided.

12:00 – 13:00**Lunch with Programme Team**

The University should provide a light lunch for the Panel and the programme team in a suitable venue.

13:00 – 15:00**Private meeting of Panel**

A private meeting room should be provided. The Panel may require that additional documentation is made available during this meeting. Therefore, the contact details of a member of staff, who will be available to assist, should be provided.

15:00 – 16:00**Feedback to the Programme Team**

The timing of the feedback session is flexible depending on the private meeting of the Panel. The Chair will deliver feedback to the programme team including the provisional outcome of the process where possible (final decisions are made by the RSB's Accreditation Committee).

16:00**End of visit**

Appendix E – Guidelines for publicity following successful accreditation

Programmes undertaking the accreditation process will not be publicly announced until they have successfully completed the accreditation process and we ask that the University keep their participation confidential.

Further tailored publicity guidance (dependent on the type of accreditation awarded) will be sent once the University is successfully awarded accreditation.

Upon completion, successfully accredited degree programmes will be entitled to:

- Receive a certificate of Accreditation from the Royal Society of Biology
- Promote the accredited degree programme(s) and the benefits of studying and graduating from an accredited programme in marketing materials
- Use the Royal Society of Biology's name and logo on all materials relating to an accredited degree programme(s)
- Use the Royal Society of Biology's name and logo on the University's website in relation to the accredited degree programme(s)
- Use the Royal Society of Biology's name and logo on other marketing materials relating to the accredited degree programme(s), following permission from the Royal Society of Biology
- Use the following statement on the University's website in relation to the accredited degree programme(s):

This programme has been accredited by the Royal Society of Biology following an independent and rigorous assessment. Accredited degree programmes contain a solid academic foundation in biological knowledge and key skills, and prepare graduates to address the needs of employers. The accreditation criteria require evidence that graduates from accredited programmes meet defined sets of learning outcomes, including subject knowledge, technical ability and transferable skills.

Participating universities must not imply that other establishments, yet to achieve accreditation, are not offering relevant, high-quality programmes when referring to the Accreditation Programme in external literature.

The Royal Society of Biology maintains the right to request the removal of its name and all of its trademarks, including its logo, from printed or electronic material or publications at any time.

Appendix F – Guidance for interim accreditation

The Royal Society of Biology encourages universities with new programmes, where students have yet to graduate, to apply for accreditation. Under these circumstances, the accreditation process is likely to include a review of the programme documentation and a site visit before the first cohort of students graduate. The Society may grant interim accreditation pending first cohort graduation, with full accreditation status awarded afterwards, if appropriate. Universities with relevant programmes should contact the Accreditation Team in advance of their application.

The decision process for interim accreditation is likely to involve the following steps:

- Submission of all relevant stage one documentation, as detailed in Appendix A
- Review of documentation by the Accreditation Assessment Panel, and completion of an interim accreditation Stage One Report:

If assessors feel there is a substantial gap between the proposed outcomes for the programme and those required for accreditation, this will be communicated to the University. At this point, the University may choose to implement any suggested changes and resubmit for interim accreditation; or apply for full accreditation following the graduation of the first cohort of students; or withdraw their application. Any reapplication will incur additional costs for assessors' time and effort, but consideration will be given to the initial review.

- If assessors feel the course demonstrates the potential to meet the required outcomes, a site visit will be scheduled, as detailed in Appendix D
- Following the site visit, the Panel will complete an interim accreditation Stage Two Report, highlighting the final steps for the programme in question:

If the site visit highlights aspects of the programme that do not achieve the outcomes for accreditation, these will be communicated to the University. At this point, the University may choose to implement any suggested changes and resubmit for interim accreditation; or apply for full accreditation following the graduation of the first cohort of students; or withdraw their application. Any reapplication will incur additional costs for assessors' time and effort, but consideration will be given to the initial review.

If the Panel is satisfied that the required outcomes for accreditation will be achieved, they can recommend to the RSB Accreditation Committee that the programme should be awarded interim accreditation. An interim accreditation Stage Three Report will be sent to the University where actions relating to conditions or recommendations should be evidenced. The University will have a period of six weeks to complete the Stage Three Report and provide any supporting documentation. Interim accreditation is not formally awarded until the Stage Three Report has been completed.

- Following the award of interim accreditation, the University must complete an annual report declaring any changes implemented since the initial stage one review

Interim to Full Accreditation

In order to gain full accreditation, documentation should be provided to assure the assessors that the graduate learning outcomes are being achieved, and that any recommendations made by the Panel for improving the programme are being acted upon.

Once the first cohort of students has graduated, and if the Panel is satisfied that the programme meets the requirements for accreditation, it can recommend to the RSB Accreditation Committee that full accreditation status should be awarded.

Should the Panel conclude that there is insufficient evidence to award full accreditation, the programme will continue with the status of interim accreditation, until sufficient evidence is submitted.

Interim accreditation will be awarded for a period of five years; if there is insufficient evidence that the programme meets the requirements for full accreditation at the end of that period, interim accreditation status will be withdrawn.

Programmes will be awarded full accredited status for the remainder of the initial five year period, unless a site visit is required. If a site visit is required, full accredited status will be awarded for a period of five years from the date of ratification.

Guidelines for publicity following award of interim accreditation

Following the achievement of interim accreditation, the University will be entitled to:

- Use the Royal Society of Biology's name and logo on all printed and digital materials, including the University's website, relating to programmes awarded with interim accreditation
- Use the Society's name and logo on all other marketing materials relating to the interim accredited programme(s), following permission from the Royal Society of Biology
- Use the following statement on the University's website in relation to the interim accredited programme(s):

This programme has been interim accredited by the Royal Society of Biology following an independent and rigorous assessment. Accredited degree programmes contain a solid academic foundation in biological knowledge and key skills, and prepare graduates to address the needs of employers. The accreditation criteria require evidence that graduates from accredited programmes meet defined sets of learning outcomes, including subject knowledge, technical ability and transferable skills. Following a successful demonstration to the Society that these graduate attributes have been attained, and the first cohort of students from the programme have graduated, the programme may be awarded full accreditation.

Further tailored publicity guidance will be sent once the University is successfully awarded interim accreditation, depending on the type of accreditation awarded.

Universities must not imply that full accreditation of any programme is guaranteed following receipt of interim accreditation.

Participating universities must not imply that other establishments, yet to achieve accreditation or interim accreditation, are not offering relevant, high-quality programmes when referring to the Degree Accreditation Programme in external literature.

The Royal Society of Biology maintains the right to request the removal of its name and all of its trademarks, including its logo, from printed or electronic material or publications at any time.

Appendix G – Glossary

Credit One credit is notionally ten hours of student effort, assuming that one academic year is 120 credits, and one calendar year is 180 credits: 80 credits is equivalent to 40 European Credit Transfer and Accumulation System (ECTS) credits.

Degree accreditation Acknowledgement by an external body that a degree programme meets certain prescribed specifications.

Interim accreditation Acknowledgement by the Royal Society of Biology that a degree programme with no current graduates demonstrates the potential to meet the prescribed criteria for accreditation. Full accreditation may be granted following further assessment, and a sufficient number of students have graduated to demonstrate the learning outcomes are being achieved.

Learning outcomes Statements that specify what a graduate will know, understand, or be capable of doing as a result of obtaining a qualification. Learning outcomes are expressed knowledge, understanding, skills, and attributes, and will have been assessed in the degree programme.

Levels Qualification levels indicate the relative academic demand, complexity of understanding, depth of learning and degree of autonomy expected of the learner. A number of different qualifications frameworks are used in the UK and when referring to levels it is essential to know which framework is being used (for more information search FHEQ on www.qaa.ac.uk).

The Framework for Higher Education Qualifications (FHEQ) applies in England, Wales and Northern Ireland (NI). Although it replaced a previous version of FHEQ, the titles used in the previous version (e.g. Master's) are still widely used. FHEQ describes five levels of qualifications, 4-8 (with 8 being the highest). This definition aligns with the Qualifications and Credit Framework (QCF) that encompasses post-16 levels of learning, including National Vocational Qualifications (NVQs).

In Scotland, the Scottish Credit and Qualifications Framework (SCQF) is mapped against the Scottish Higher Education Levels (SHE).

The Bologna Process requires each country to verify that its national framework is compatible with an overarching Framework for Qualifications of the European Higher Education Area (FQ-EHEA). The FQ-EHEA consists of three main cycles.

The relationship between the different systems is shown below:

Table based on www.qaa.ac.uk/docs/qaa/quality-code/bologna-process-in-he.pdf?sfvrsn=e04cf981_14 and www.qaa.ac.uk/docs/qaa/quality-code/qualifications-frameworks.pdf

FHEQ level (England, Wales and NI)	FHEQ 2001 Level	SCQF level (Scotland)	SHE level (Scotland)	FQ-EHEA cycle	Qualification
8	Doctoral (D)	12	D	Third cycle (end of cycle) qualifications	Doctoral degrees (e.g. PhD/ DPhil (including new-route PhD), EdD, DBA, DClinPsy)*
7	Master (M)	11	M	Second cycle (end of cycle) qualifications	Master's degrees (e.g. MPhil, MLitt, MRes, MA, MSc)
					Integrated Master's degrees** (e.g. MEng, MChem, MPhys, MPharm)
					Postgraduate diplomas
					Postgraduate Certificate in Education (PGCE)***
					Postgraduate certificate
6	Honours (H)	10	H	First cycle (end of cycle) qualifications	Bachelor's degrees with honours (e.g. BA/BSc Hons)
			9		3
					Professional Graduate Certificate in Education (PGCE)***
					Graduate diplomas
					Graduate certificate
5	Intermediate (I)	8	2	Short cycle (within or linked to the first cycle) qualifications	Foundation degrees (e.g. FdA, FdSc)
					Diplomas of Higher Education (DipHE)
					Higher National Diplomas (HND)
4	Certificate (C)	7	1		Higher National Certificates (HNC)****
					Certificates of Higher Education (CertHE)

Notes

- * Professional doctorate programmes include some taught elements in addition to the research dissertation. Practice varies but typically, professional doctorates include postgraduate study equivalent to a minimum of three full-time calendar years with level 7 study representing no more than one-third of this.
- ** Integrated Master's degree programmes typically include study equivalent to at least four full-time academic years, of which study equivalent to at least one full-time academic year is at level 7. Thus, study at Bachelor's level is integrated with study at Master's level and the programmes are designed to meet the level 6 and level 7 qualification descriptors in full.
- *** See www.qaa.ac.uk
- **** Higher National Certificates (HNCs) are positioned at level 4, to reflect typical practice among higher education awarding bodies that award HNC under license from Edexcel.

Outcomes-based procedures	The methods our Accreditation Assessment Panel use to judge applications for accreditation. Graduates of these courses meet our learning outcomes within the specified criteria upon graduation.
Period of practice	A planned period of learning which is designed to support the student's attainment of a defined set of learning outcomes relating to supervised practice in the particular subject area. It includes those circumstances where students have arranged their own learning opportunity with a provider, with the approval of the University. In all cases, programme providers are responsible for monitoring the quality of the learning experience, and its ongoing capacity to meet students' needs.
Programme	A coherent learning experience followed by an individual, the successful completion of which results in the conferment of a named higher education award.
Programme specification	A concise description of the intended learning outcomes of a University programme, and the means by which the outcomes are achieved and demonstrated.
Programme structure	Content of the programme, including mandatory and optional modules, rules for combining units and any specified pathways.
QAA	The Quality Assurance Agency for higher education responsible for maintaining standards across UK universities (www.qaa.ac.uk).
Quality assurance	A range of review procedures designed to safeguard academic standards and promote learning opportunities for students of acceptable quality.
RSB Degree Accreditation	Follows an independent and rigorous assessment of degree programmes which contain a solid academic foundation in biological knowledge and key skills, and prepare graduates to address the needs of employers.
RSB Advanced Degree Accreditation	Externally recognises academic excellence in the biosciences, highlighting degrees which educate the research and development leaders and innovators of the future.
Subject Benchmark Statement (UK)	This is overseen by QAA in England, and provides a reference point against which outcomes can be measured. Subject Benchmark Statements provide a means for the academic community to describe the nature and characteristics of programmes in a specific subject. They also represent general expectations about the standards for the award of qualifications at a given level and articulate the attributes and capabilities that those possessing such qualifications should be able to demonstrate.



Becoming a member

The Royal Society of Biology is the leading professional body for the life sciences in the UK. Our vision is to represent all who are committed to biology in academia, industry, education and research; facilitate the promotion and translation of advances in biological science for national and international benefit; and engage and encourage public interest in the life sciences.

The Society represents more than 18,000 individual members, including professionals from industry, academia and education; practising scientists; students; and interested non-professionals.

As a member, you will receive a wide range of benefits, all designed to support you as a biologist, which include:

- **Access to Professional Registers and Continuing Professional Development programme:** Chartered Scientist (CSci), Chartered Biologist (CBiol), Chartered Science Teacher (CSciTeach), Registered Scientist (RSci) and Registered Science Technician (RSciTech)
- **Discounted training courses:** members save up to 50% when attending courses from our newly-expanded training programme
- **Networking events:** members are invited to attend nationally and locally organised events throughout the year, where they can meet peers, other biologists and senior Society staff
- **The Biologist magazine:** all members receive a subscription to our award-winning magazine, published six times a year
- **Opportunities to proactively support the future of UK biology:** input to our science and education policy work, and support our public engagement regional activities
- **Post-nominal letters:** Associates, Members and Fellows of the Society can use the appropriate post-nominal letters (AMRSB, MRSB or FRSB) to signify their status as a professional biologist





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