

An accredited biology degree

Accreditation expert Richard Reece explains what degree accreditation is and suggests one way to distinguish between different courses offered by universities in the UK

If you are interested in the natural world and have enjoyed your AS/A2 course, you may decide that you would like to go to university to study a biology-related degree. But which university should you apply? And, should you apply to a university that offers an accredited degree?

Key words



Degree
Career
Research skills

What can you get from university?

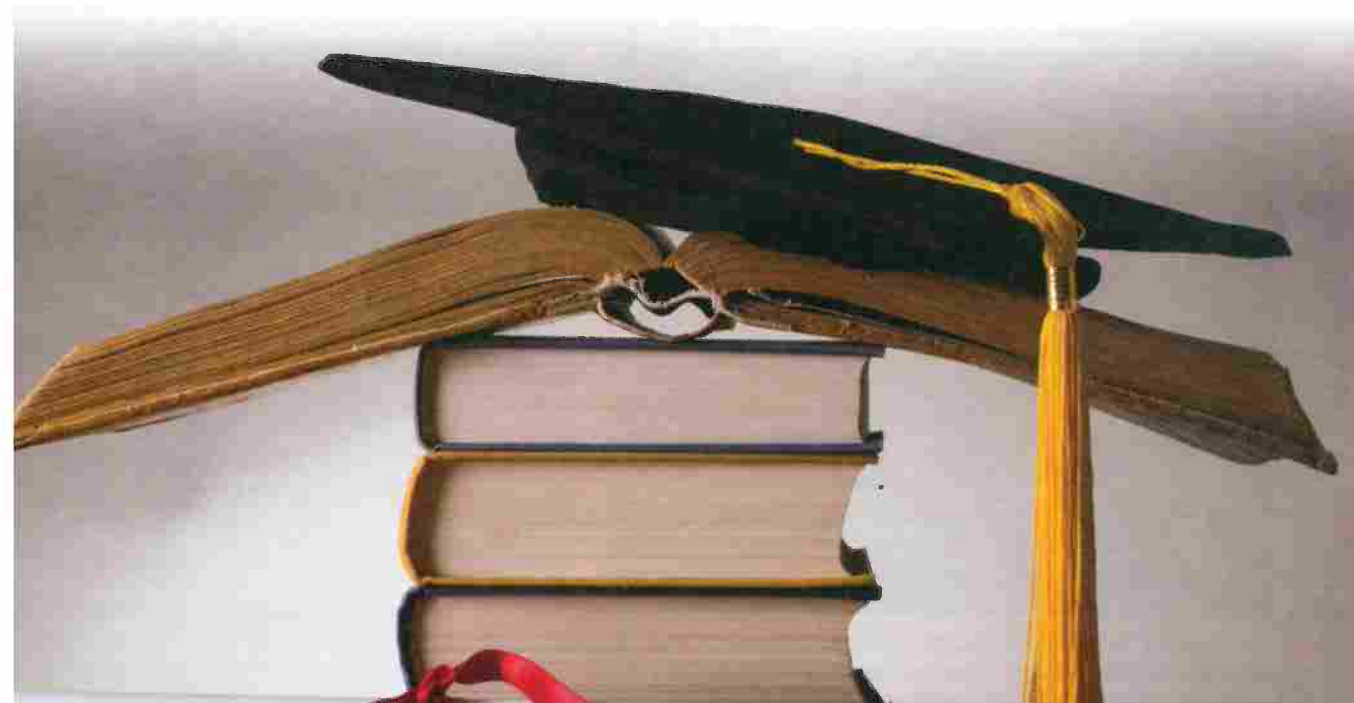
Over 100 UK universities and many thousands more across Europe offer biology-related degrees, and well over 30 different types of biology degrees available (see Box 1), how can you decide which is right for you? Part of this decision will, no doubt, depend on the reputation of the university and maybe more practical issues such as where the university is located, and how the perceived social life and sports facilities fit with your aspirations. However, for the course you are considering, it is unlikely to have much more information than is found on the university website or in a prospectus, together with facts that you may learn from an open day. In short, it is often difficult to tell one university from another.

Employers of graduates with biology-related degrees face a similar problem. Are the knowledge and skills of a student graduating with a degree from University X the same as those graduating with a degree from University Y? Probably not, but this is not an easy question

to answer with certainty. Different universities have different entry requirements. They can also focus the degrees they offer in a variety of different ways depending on their own expertise and can provide their students with a whole host of different experiences. Employers are increasingly keen to know what they are likely to expect from a 'typical' graduate from a particular university course.

What is accreditation?

This is where accreditation of degree courses can help. In higher education, the term 'accreditation' refers to the professional endorsement of a qualification. In most cases, this means



Box 1 Biology-related degree programmes offered at UK universities

Some of the biology-related degree programmes offered at UK universities are listed below. Many of these courses are offered in combination with each other (e.g. pharmacology and physiology) or in combination with other subjects (e.g. biology with a foreign language).

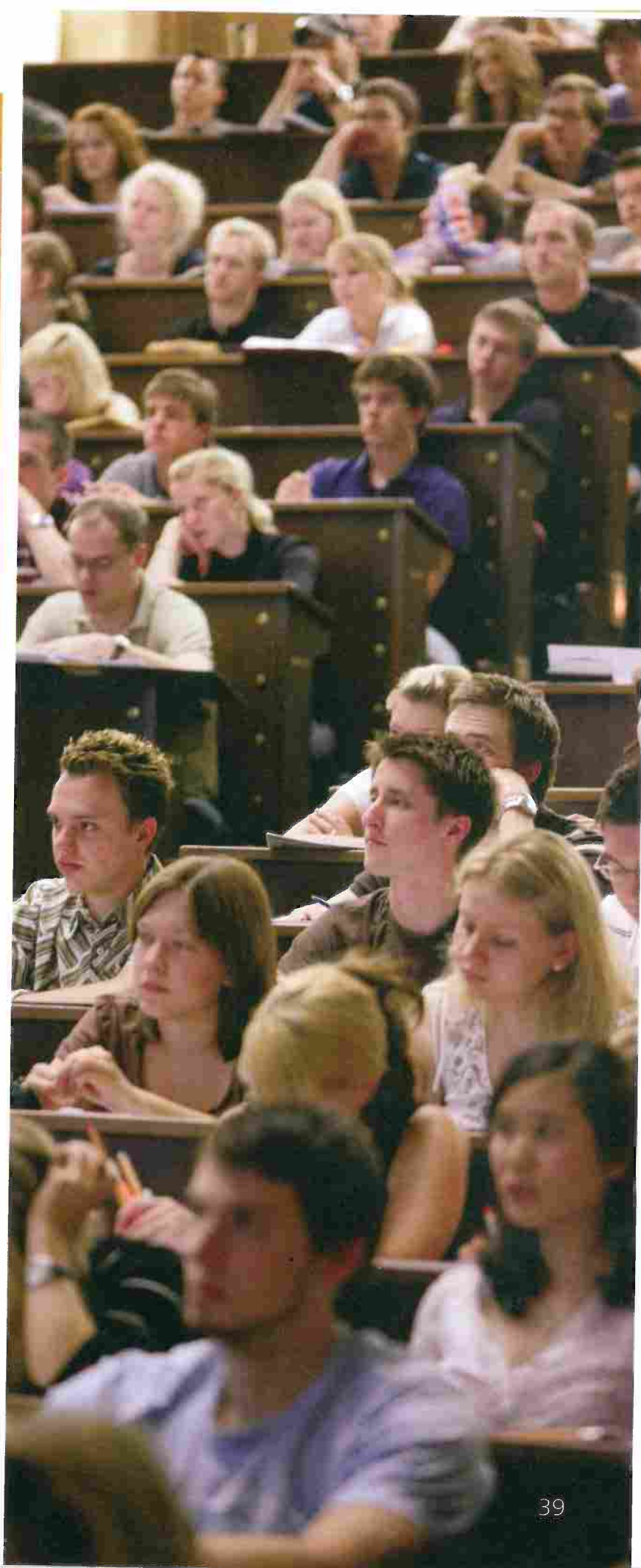
Anatomy	Genetics
Animal behaviour	Human biology
Biochemistry	Life sciences
Biodiversity	Marine biology
Biological chemistry	Medical biochemistry
Biological science	Microbiology
Biology	Molecular biology
Biomedical sciences	Natural sciences
Biomedicine	Neuroscience
Biophysics	Pharmacology
Biotechnology	Physiology
Cell biology	Plant sciences
Conservation biology	Taxonomy
Developmental biology	Virology
Ecology	Zoology
Environmental biology	

that a course has met the minimum standards established by external professional bodies and organisations. Accreditation may also define the 'core' of a subject to which all graduates of such programmes should be expected to have been exposed. In the UK, most science-related degree programmes are subjected to scrutiny of this type. For example, the Royal Society of Chemistry and the Institute of Physics both have long-established schemes for the accreditation or recognition of degree programmes in their respective subject areas.

Until recently, most biology-related degrees in the UK have not had the opportunity for accreditation. This is not because we do not have minimum expected specifications for these degrees — in the UK these have been defined by the Quality Assurance Agency (QAA). The problem is the wide-ranging nature of topics covered by biology-related degrees. Attempting to define the 'core' of degree programmes that might range in overall focus from anatomy to zoology and encompass areas such as biochemistry, genetics, plant sciences, taxonomy and medical sciences will never be an easy task. As a consequence, it was difficult to know whether accreditation would be helpful to either students or their potential employers and, if so, how it should be undertaken.

Degree accreditation by the Society of Biology

In 2011, the Society of Biology, the UK's learned society for biology professionals (see Box 2 on p. 40), started to offer advanced accreditation for biology degree programmes that gave students the opportunity to undertake a significant period of research as part of their studies. They did this to enable students to make better informed choices on their place of study, and to begin to address the concerns of bioscience industry employers about the skills of graduates entering the workplace. From the beginning, the Society set out to do something very different with accreditation.



Box 2 Activities of the Society of Biology

The Society of Biology (www.societyofbiology.org) is a single unified voice for biology:

- advising government and influencing policy
- advancing education and professional development
- supporting its members, and engaging and encouraging public interest in the life sciences

The Society represents a diverse membership of individuals, learned societies and other organisations and has over 14 000 individual members, and over 90 member organisations.

The Society supports the study of biology at all levels and champions a biology curriculum that challenges students and encourages their passion for biology. It provides careers guidance to students at all levels and organises and exhibits at all the major UK science festivals, providing opportunities for anyone interested in science to meet with, work with, and find out more about the Society. In addition, the Society organises 'Biology Week' each October and runs a large number of biology-based competitions, including science communication awards, a photography competition, book awards, primary science teacher of the year, school teacher of the year, HE teacher of the year, the young biologist award and the British Biology Olympiad.

The Society's flying ant survey (<http://tinyurl.com/pmkrr9o>) and house spider survey have proved to be popular with students and have generated important data for scientific research.

It sought to develop accreditation as a mechanism to define and mark out degree course excellence in particular aspects of what it delivers to students. Accreditation was not designed as a process to either set minimum standards of UK biology degrees, or to attempt to dictate what should be taught (or at what level). Instead, the Society accredits the final product — the ability and skill set of the student at the end of the degree programme.

The Society of Biology defines a course that is suitable for advanced accreditation in several ways:

- First, a course must deliver a set of stipulated criteria. For a biochemistry programme, for example, these criteria were established in close consultation with experienced biochemists. In short, it was decided that all biochemistry students on accredited courses should be taught a strong



basis of chemistry, maths and physical sciences. However, the Society does not stipulate specific topics that must be taught (e.g. enzyme kinetics or specific signalling pathways), or regulate the order or level in which topics are delivered.

- Second, students should be exposed to at least 6 months of continuous full-time research so that they can put into context what they have learned in theory and develop other skills, such as those involved in experimental design and interpretation. The Society considered that this extensive period of experimental work is required to enable students to develop the high-level skills that will help them for further research careers and the wider world of employment. In addition, students from accredited programmes will be trained in many of the attributes that graduate employers seek (e.g. numeracy, problem solving, oral and written communication, and presentation skills).

A consequence of the stipulation for extensive research training is that 3-year BSc programmes are not currently being considered for advanced accreditation. They simply do not have the time available to allow students to gain this intensive exposure to research and acquire the skills that such exposure offers. Therefore, the Society is currently only offering advanced accreditation to 4-year BSc programmes that include an extensive period of research in a professional setting and 4-year integrated Masters degrees (an undergraduate degree combined with an extra Master's year, often leading to the award of a Masters in biological science, MBiolSci). An accreditation programme for more traditional 3-year BSc programmes (or 4-years in Scotland) is currently under development.

Is an accredited programme right for me?

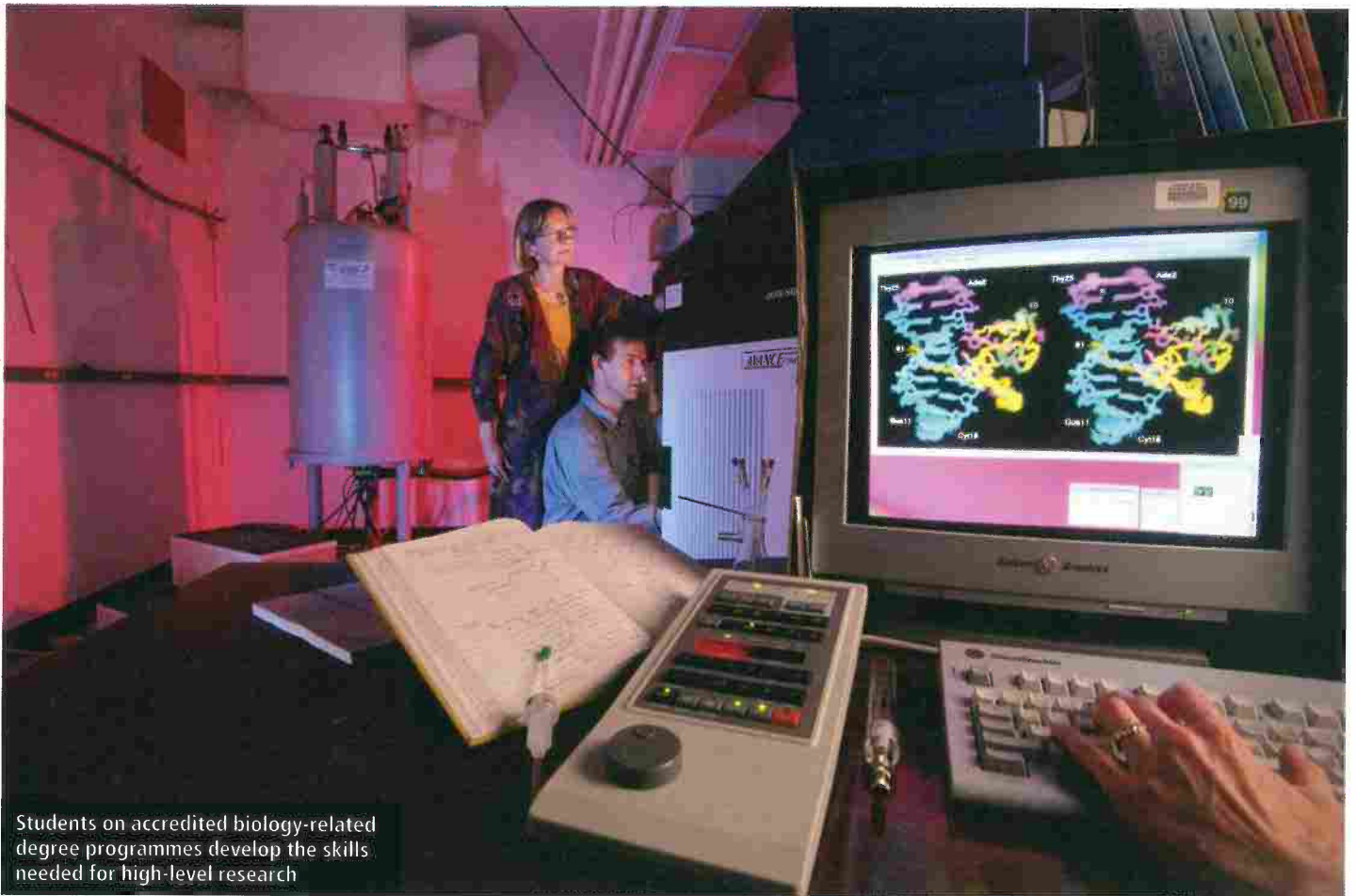
If you are considering entering a career in research then you might want to think about the practical skills and experience a particular degree will offer. As advanced accredited biology-related degrees have been formally assessed and proven to introduce students to the skills that will enable them to take part in high-level biological research, studying a degree accredited by the Society of Biology is one way to show you have gained these skills. Courses with advanced accreditation also enable the development of other skills that become honed as a consequence of undertaking a period of original research. These include:

- an appreciation of how science works
- the understanding of a specific topic in depth
- the ability to read and understand scientific literature
- the ability to work and think independently
- problem solving skills
- communication — both written and oral
- appreciation of the practical application of course work

All of these skills have the potential to increase your chances of success in a competitive job market.

How can I tell whether a degree programme is accredited?

All universities in the UK are required to produce a key information set (KIS) for each of their degree programmes. Programmes that have been accredited by the Society



Students on accredited biology-related degree programmes develop the skills needed for high-level research

of Biology will be identified in the KIS data. Accredited programmes are also marked with the following text within this information:

Accredited by the Society of Biology for the purpose of meeting in part the academic and experience requirement for Membership and Chartered Biologist (CBiol)

Should I avoid degree programmes that are not accredited?

Absolutely not! In its current format, accreditation seeks to identify programmes that teach students specific skill sets. Accreditation is, however, optional. Many UK undergraduate courses are not currently accredited even though they meet the criteria. In addition, there are many excellent degree programmes delivered by UK universities that may not meet the accreditation criteria — they may simply emphasise different aspects of the subject. For example, courses that focus on non-research graduate employment skills (e.g. entrepreneurship) are no less relevant to a future career just because they are not accredited. Accreditation is simply one way in which you can tell what type of degree programme you will be choosing to study.

The future of accreditation

Since its introduction in 2011, the biology degree accreditation programme has progressed rapidly, with approximately

80 separate degree programmes being accredited by early 2014. Accreditation follows a process of peer assessment. Academics and subject experts from other universities and industry make judgements as to whether a particular course for which accreditation has been applied for meets the required standard. Some do not.

Financial pressures on universities to cut back on laboratory-based training and exposure to significant levels of research experience are severe. Therefore, if accreditation can help to halt this decline by emphasising the importance of the practical and research skills that employers crave, then it should be considered an enormous success. Historically, accreditation in other subject areas, beyond biology, began on a small scale and progressed rapidly throughout the whole of the relevant community. This may well happen with biology and its related disciplines. However, the future of accreditation depends on how students, and potential employers, view the benefits of graduating from an accredited course.

Richard Reece is professor of molecular biology at the University of Manchester, where he is also the Associate Vice-President for Teaching, Learning and Students. He is a member of the Society of Biology Degree Accreditation Committee and Council and has chaired many accreditation assessment panels.