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Biological Sciences (Biotechnology) BSc (Hons)

Genetic Engineering, the ability to manipulate the genetic composition of an organism is one of the most remarkable advances in modern biology and has a huge potential impact on industry, agriculture, medical science and the environment. This is the basis of biotechnology. The primary aim of this degree is to give students a detailed understanding of these methods for genetic manipulation and their applications in modern biological industries. This understanding will be grounded in a wider appreciation of biology.

95% of our graduates are in employment or further study 6 months after graduation and we rank 3rd for graduate employability in the Russell Group Universities. Our graduates work in diverse careers such as medicine, conservation, agriculture and more.

2014 National Student Survey "95% of our students said that our staff are enthusiastic about what they are teaching"

Study here and find out why the University of Birmingham has been awarded The Times and The Sunday Times University of the Year 2013-14 (http://www.birmingham.ac.uk/news/latest/2013/09/20-sep-Birmingham-announced-as-University-of-the-Year.aspx)

Course fact file

UCAS code: C100

Duration: 3 years

Places Available: 250 (Total number of places for all undergraduate courses in the school)

Applications in 2013: 1819

Typical Offer: AAA-AAB (**More detailed entry requirements and the international qualifications accepted can be found in the course details (?OpenSection=EntryRequirements)**)

Start date: September

Related courses

Biological Sciences courses - School of Biosciences - Study here for your Bsc degree (/schools/biosciences/courses/undergraduate/biological-sciences.aspx)

Contact

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Web: **www.birmingham.ac.uk/biosciences (http://www.birmingham.ac.uk/biosciences)**

School of Biosciences (/schools/biosciences/index.aspx)

Details

This degree course is structured to give you a comprehensive introduction to biotechnology in the context of the broader Biological Sciences programme. The modular structure gives you the opportunity to follow your interests and curiosity as the course unfolds.

Why study this course

We have a large and internationally recognised School of Biosciences offering expertise that is the foundation of our research-led teaching.

You will encounter a broad range of topics on our courses. We pride ourselves in our 'enquiry-based learning' strategy that will equip you with the skills to achieve full potential in your future career.

We increasingly incorporate new areas of science relating to biology, such as bioinformatics, and the School has major high-technology facilities for research in genomics, structural biology and optical imaging.

Genetic Engineering, the ability to manipulate the genetic composition of an organism is one of the most remarkable advances in modern biology and has a huge potential impact on industry, agriculture, medical science and the environment. This is the basis of biotechnology.

Modules

For a detailed description of modules **download Biological Sciences Module Descriptions (PDF 459KB) (/Documents/college-les/biosciences/BiologicalSciencesModuleDescriptions(PDF128KB).pdf)** .

First Year

Biochemistry and Genetics are key first year modules that introduce you to the important concepts in biotechnology. Along with all of the other students on the Biological Sciences programmes you will take other modules (listed below) designed to introduce you to all aspects of this broad subject discipline.

Key First Year Modules:

Biochemistry
Genetics I

Introduction to Evolution and Animal Biology **Watch video** **(/undergraduate/courses/biosciences/module-evolution.aspx)**
Microbiology and Infectious Disease **Watch video** **(/undergraduate/courses/biosciences/module-bio153-microbiology-infectious-disease.aspx)**
Cell Biology and Physiology
Plant Sciences and Environmental Biology **Watch video** **(/undergraduate/courses/biosciences/module-plant.aspx)**
Skills for Biosciences

Second Year

Your key second year module is the core module Molecular biology and its applications, Microbes and Man also has a large section on the applications of biotechnology which is highly relevant to biotechnology students. You choose 4 other optional modules from the list below:

Key second year module:

Molecular Biology and its applications

Other Second Year optional modules

Microbes and Man
Ecology
Cell and Developmental Biology
Animal Sensory Systems, Neurobiology and Behaviour
Genetics II
Human Evolution, Adaptation and Behaviour
Plant Sciences: from Cells to the Environment **Watch video** **(/undergraduate/courses/biosciences/module-bio237-plant-science-cells-environment.aspx)**
Field Course: Alpine and Glacial Ecology in Norway **Watch video** **(/students/courses/undergraduate/biosciences/module-alpine-glacial-ecology.aspx)**
Field Course: Urban Ecology in Birmingham
Field Course: Adaptations to Aquatic Environments

Core module taken by all second year students:

Science Communication

Final Year

The final year allows choice from a range of specialised topics in biotechnology which are informed and inspired by the research being carried out in the school.

Central to the final year is the research project, which makes up one third of the credits earned in the final year. If you choose a practical project this allows you to join one of our many research groups, providing the fascinating opportunity to experience research first hand and to contribute to current research projects. Alternatively, for your research project, you can carry out a critical review of literature in an area that you are interested in.

Choose a research project and at least 2 final year modules from:

Bacterial Gene Regulation
Eukaryotic Gene Expression
Applied and Environmental Microbiology

Other Final Year optional modules

Genetics III: Genetic Variation in Humans and other Eukaryotes
Plant Science in the 21st Century **Watch video** **(/undergraduate/courses/biosciences/module-bio398-plant-science-21st-century.aspx)**
Structures of Destruction
Cancer Biology
Human Evolution
Cellular Neurobiology **Watch video** **(/undergraduate/courses/biosciences/module-bio379-cellular-neurobiology.aspx)**
Adaptation to changing environments
Advanced topics in Animal Behaviour
Whole-Organism Biology
Living in Groups: Collective Behaviour in Animals **Watch video**

(/undergraduate/courses/biosciences/module-bio397-living-in-groups.aspx)

Human Reproductive Biology and Development

Molecular and Cellular Immunology Watch video (/undergraduate/courses/biosciences/module-bio388-molecular-cellular-immunology.aspx)

Conservation Biology

Molecular Basis of Bacterial Infection Watch video (/undergraduate/courses/biosciences/module-bio305-molecular-basis-bacterial-infection.aspx)

Fees and funding

Standard fees (http://www.birmingham.ac.uk/students/ug/courses/fees/standard) apply
Learn more about **fees and funding** (/undergraduate/fees/loans.aspx)

Scholarships
Learn more about our **scholarships and awards** (/undergraduate/fees/funding/index.aspx)

Entry requirements

Number of A levels required: 3

Typical offer: AAA-AAB

Required subjects and grades: Biology/Human Biology A level and one other from Chemistry, Computer Science, Environmental Studies, Geography, Geology, ICT, Maths, Physics, Psychology or Sports Studies/PE. Five GCSEs at grade C (minimum) in Double Award/Integrated Science, English and Mathematics.

General Studies: We do not accept General Studies, Critical Thinking, Citizenship Studies, Applied Science, Communication and Culture, Critical Studies, Global Perspectives, Science in Society and World Development.

Additional information:

BTEC Level 3 Extended Diploma (Applied Science) is accepted only in combination with a science subject at GCE A2 level at grade B or better. Other qualifications are considered – learn more about **entry requirements** (http://www.birmingham.ac.uk/students/ug/requirements).

International students:

International Baccalaureate Diploma: 35-36 points excluding bonus points from TOK and Extended Essay. 6, 6, 5 at HL to include Biology and one other science at HL. 5 points in each of SL English and Maths if not offered at GCSE or equivalent.

Standard English language requirements apply
Learn more about **international entry requirements** (http://www.birmingham.ac.uk/students/ug/requirements/international)

Depending on your chosen course of study, you may also be interested in the Birmingham Foundation Academy, a specially structured programme for international students whose qualifications are not accepted for direct entry to UK universities. Further details can be found on the **foundation academy web pages** (http://www.birmingham.ac.uk/students/foundation-academy/Pathways/index.aspx).

How to apply

Apply through UCAS at **www.ucas.com** (http://www.ucas.com/)
Learn more about **applying** (http://www.birmingham.ac.uk/students/ug/courses/apply)

Related links

Biological Sciences MSci (Hons) (/undergraduate/courses/biosciences/biological-sciences-msci.aspx)

Undergraduate courses - School of Biosciences - Study here for your Bsc degree (/schools/biosciences/courses/undergraduate/index.aspx)

Biological Sciences Module Descriptions (PDF 128Kb) (/Documents/college-les/biosciences/BiologicalSciencesModuleDescriptions(PDF128KB).pdf)

Learning and teaching

As a Birmingham student you are part of an academic research elite and will learn from world-leading experts. From the outset you will be encouraged to become an independent thinker, however you will have plenty of contact with the staff who teach you.

- **Lectures** - Your learning will take place in a range of different settings, from scheduled teaching in lectures and small group tutorials, to self-study and peer group learning. As well as traditional whiteboard and pen, our lecture theatres are equipped with the latest techology including movies and animations, molecular graphics and ?ask the audience? style electronic voting systems. Student interaction using various social media is encouraged before, during and after lectures.

Take a virtual tour of one of our teaching labs (http://www.birmingham.ac.uk/schools/bioscience/lab.aspx)

- **Practical classes** - Laboratory-based practical work is an integral part of our degree. A typical practical session will last 3 hours delivering important transferable skills, experience of practical work is essential if you wish to move into a research career and is valued by a wide range of employers. You will be able to engage with academic and post graduate researchers who will help you during these practical sessions.
- **Field courses** - Biological Sciences students have the opportunity to develop their field skills on a wide range of field courses in different environments. See the Course Modules tab for details.
- **Tutorials** - A personal tutorial system is an essential feature of our degree programme and your tutors will help you in three important areas: supporting your academic progress, developing transferable skills and helping with any welfare issues. From the outset, you will be assigned your own Personal Tutor who will get to know you as you progress through your studies, providing academic and welfare advice, encouraging you and offering assistance in any areas you may feel you need extra support to make the most of your potential and your time here at Birmingham.

To begin with you may find university level education challenging, but we will support you to enable you to make this transition. You will have access to a comprehensive support system in the School, including personal tutors and welfare tutors, who can help with both academic and welfare issues throughout your course. You will have a formal transition review during your first year to check on your progress and identify areas where you may need some additional support, and the School's academic small group tutorial system will provide you with skills based support throughout the course.

Clinical anatomist, author and broadcaster Alice Roberts is the University's Professor of Public Engagement in Science. You can watch Alice's lecture Origins of us: Human Anatomy and Evolution above.

Alice carries out a range of academic duties which include teaching second year Biosciences students.

Our **Academic Skills Centre (https://intranet.birmingham.ac.uk/as/libraryservices/asc/index.aspx)** also offers you support with your learning. The centre is a place where you can develop your mathematical, academic writing and general academic skills. It is the centre's aim to help you to become a more effective and independent learner through the use of a range of high-quality and appropriate learning support services. These range from one-to-one support with mathematics and statistics based problems from experienced mathematicians, to workshops on a range of topics including note talking, reading, writing and presentation skills.

Assessment methods

Studying at degree-level is likely to be very different from your previous experience of learning and teaching. You will be assessed in a variety of ways and each module is assessed independently. All modules contain some components of continuous assessment, that is, assessment taking place during the teaching terms. Continuous assessment generally accounts for over one-third of the mark for a given module, while two thirds are contributed by the end-of-year examination in the summer term. A subset of modules is assessed through course work, without an end-of-year examination.

At the beginning of each module, you'll be given information on how and when you'll be assessed for that particular programme of study. You'll receive feedback on each assessment within four weeks, so that you can learn from and build on what you have done. You'll be given feedback on any exams that you take; if you should fail an exam we will ensure that particularly detailed feedback is made available to enable you to learn for the future.

More information about assessment methods and feedback is given below:

- **Feedback** - You will be able to track your development by making use of a wide range of types of feedback, such as: written feedback on your assessments, class feedback and questions sessions and discussions with your tutor.
- **Examinations** ? The formal end-of-year examinations (in May/June of each year) are complemented by course work in the form of essays or reports, data handling or interpretation exercises, poster presentations, seminar presentations, group work and lab reports.
- **Projects and dissertations** ? You will choose the topic of your project from a wide range of titles. We offer a range of projects including practical work in the laboratory, field work, computer based projects, or literature reviews to give you the chance to demonstrate the full range of academic and transferable skills.

Employability

Top career prospects for our Biosciences Graduates - Only Cambridge can offer better!

Graduates of the University of Birmingham are highly regarded among employers in the UK, and a Biological Sciences degree from Birmingham is an excellent qualification for securing your future career in a diverse range of industries and employment sectors. Whether you have a clear idea of where your future aspirations lie or want to consider the broad range of opportunities available once you have a Birmingham degree, our Careers Network can help you achieve your goal.

2013 National Student Survey 96% of students say "as a result of my course, I believe I have improved my career prospects."

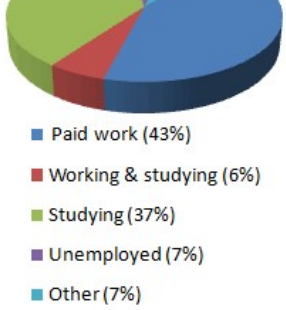
Advances in the biosciences are having a profound impact on our daily lives in areas from human health to conservation. Biotechnology, biological pharmaceuticals, and personalised medicine are key growth areas in the health sector. Environmental remediation, climate change and related themes pose multi-faceted challenges for the coming decades. Expert knowledge in biology and the life sciences will be in high demand for the foreseeable future, with bright prospects for exciting and rewarding careers in research, teaching, industry, the NHS and the public sector.

First destinations of University of Birmingham Biosciences graduates six months after graduation

A substantial part of our graduates choose to take a further degree, a Masters or PhD. For many career paths, a further degree is an essential stepping-stone, including (but not limited to) careers in research. Our graduates are highly sought after by universities around the

world, many stay in Birmingham and join one of our prestigious research groups. Did you know that PhDs are fully funded and that postgraduate students receive a tax free stipend equivalent to a salary?

In order to help you build an attractive CV, bursaries from the University can help fund a summer internship in a research laboratory or in a company. Also, you can apply for one of the highly prestigious (and competitive) **Alumni Leadership Mentoring (http://www.birmingham.ac.uk/generic/internships/mentoring/almp.aspx)** or **Global Challenge (http://www.birmingham.ac.uk/generic/internships/opportunities/globalchallenge/index.aspx)** programmes of the University, which provide unique opportunities to see top notch organisation from an insider perspective. Furthermore, the Personal Skills Award (PSA) scheme gives formal recognition to skills you acquired outside the course, for instance when volunteering for a charity or taking on responsibility within the Guild of Students. Last but not least, our 4-year course options (MSci, Professional Placement, Year Abroad) are key to giving you an edge in a competitive job market.



Destinations of Leavers of Higher Education report (DHLE) 2011/12

Helping you find the right career

The University and the School of Biosciences provide a range of services to support you in finding a career you might enjoy and to build a CV that stands out from the crowd. During term time, professional career advisers hold weekly drop-in sessions, discussing with you how to prepare a CV and cover letters, the graduate application process and how to explore possible career paths. An annual Biosciences Careers Fair brings employers from the life sciences sector to our School for networking and discussions, while in the Biosciences Insight series, professionals highlight the diverse employment opportunities in the life sciences in weekly sessions throughout the term.

Our unique careers guidance service is tailored to your academic subject area. Our team source exclusive **work experience opportunities (http://www.birmingham.ac.uk/students/careers/work-experience.aspx)** to help you stand out amongst the competition, with **mentoring (http://www.birmingham.ac.uk/generic/internships/mentoring/index.aspx)**, **global internships (http://www.birmingham.ac.uk/generic/internships/index.aspx)** and placements available to you. Once you have a career in your sights, one-to-one support with CV?s and job applications will help give you the edge. In addition, our employer-endorsed award-winning **Personal Skills Award (PSA) (http://www.birmingham.ac.uk/students/careers/psa.aspx)** recognises your extra-curricular activities, and provides an accredited employability programme designed to improve your career prospects.

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