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Important Information

Information provided by the University, such as in presentations, University brochures and on the University website, is accurate at the time of first disclosure. However, courses, University services and content of publications remain subject to change. Changes may be necessary to comply with the requirements of accrediting bodies or to keep courses contemporary through updating practices or areas of study. Circumstances may arise outside the reasonable control of the University leading to required changes. Such circumstances include industrial action, unexpected student numbers, significant staff illness (where a course is reliant upon a person’s expertise), unexpected lack of funding, severe weather, fire, civil disorder, political unrest, government restrictions and serious concern with regard to the transmission of serious illness making a course unsafe to deliver. After a student has taken up a place with the University, the University will look to give early notification of any changes and try to minimise their impact, offering suitable alternative arrangements or forms of compensation where it believes there is a fair case to do so. Offers of a place to study at the University will provide up-to-date information on courses. The latest key information on courses, entry requirements and fees can be found at www.leeds.ac.uk/coursefinder. Please check this website before making any decisions.
Leeds: the right choice

When you choose to study in the Faculty of Biological Sciences at the University of Leeds, you’ll be joining one of the leading life sciences faculties in the UK and will be taught by award-winning lecturers and world-class researchers.

Our position among the UK elite for bioscience research was confirmed in the results of the recent Research Excellence Framework (REF), where we were ranked 6th in the country for research impact (the ways in which our research makes a difference to the world). Over 80% of our research activity was rated as ‘world leading’ or ‘internationally excellent’.

Our extensive research expertise means the courses you can choose to study are at the forefront of knowledge and reflect the latest developments in the field of biological sciences. Biological sciences is an exciting and rapidly developing subject area. We offer a wide range of specialised and general biology degrees covering the spectrum of life sciences. So, whether you are looking for a specific degree, such as medical microbiology, biotechnology or sport science, or a more general degree such as biology, zoology, medical sciences or biological sciences, we have a course to suit your needs.
Choosing the right degree

LEEDS – A WORLD-LEADING SCIENTIFIC COMMUNITY

By choosing Leeds you will become part of a community of bioscientists who compete with the best institutions worldwide. Our groundbreaking research feeds directly into teaching, so you will be taught by academics at the forefront of their subject.

A £17m investment in some of the best research facilities including two of the most powerful cryo-electron microscopes in the world have been installed in the University’s Astbury BioStructure Laboratory ensuring that Leeds stays ahead of the field. The University’s two electron microscopes will help researchers to:

• Gain new insights into understanding diseases like Alzheimer’s and Parkinson’s.
• Understand how viruses are built, and how they get into and out of our cells – key steps for infection.
• Provide new details on how ion channels and transporters work – proteins which are vital for a huge number of diseases including many cancers and cardiovascular diseases.

The University owns its own working farm, which is an international centre for research into sustainable soil management. The farm is also hosting a major new investment supporting the commercial production of livestock by improving animal diets and living conditions.

Our research projects have the potential to make a major impact on global society. We are engaging with international challenges in a number of areas, including sustainable agriculture and biomedicine and health. You will be able to engage with and contribute to current research through your individual and group-based project work. Read about recent discoveries online at www.fbs.leeds.ac.uk/research

FLEXIBLE DEGREE CHOICES

The first year of many of our degree courses share the same set of compulsory modules, providing you with a broad foundation as a scientist. Then, in your second, third and fourth years, you will undertake specialist modules according to your chosen degree course.

A key benefit of having a common first year is that you can easily switch between some of our different degrees. The modular structure provides you with both core elements and optional modules that give you the flexibility to tailor your course to your interests and career plans.

Pathway | Duration
--- | ---
BSc | 3 years
BSc with Industrial Placement Year | 4 years
BSc with a Study Abroad Year | 4 years
MBiol/MSci | 4 years
MBiol/MSci with Industrial Placement Year | 5 years
MBiol/MSci with Study Abroad Year | 5 years

BSC COURSES

Most students study a three-year BSc(Hons) degree, leading to a Bachelor of Science qualification on graduation.

Why study a BSc?

• Gain an excellent scientific education from an internationally renowned biological sciences faculty.
• Opportunities to learn from leading scientists.
• Excellent career prospects based on the key skills sought by employers.
INTEGRATED MASTERS

What is an integrated masters?

The degree combines undergraduate study with postgraduate-level study. Students graduate with a dual qualification, which is an integrated degree of Master of Biology and Bachelor of Science (MBiol, BSc) or Master of Science and Bachelor of Science (MSci, BSc). Not only is the MBiol/MSci a great way to distinguish yourself in the graduate job market, but it is also fantastic preparation for students wishing to pursue a career as a professional scientist or study for a PhD.

Years 1 and 2 of the MBiol/MSci are the same as for the BSc and provide a foundation in the subject. In Year 3, you study compulsory and optional modules, a research project and a research preparation module or literature review project. In Year 4, you will study a range of Masters-level modules and undertake an extended research project. See our individual course pages for details.

If you are not yet sure whether the BSc or MBiol/MSci is right for you, don’t worry – you can change between programmes at the end of your second year when you have had more experience of advanced bioscience (as long as you meet the transfer criteria).

FIELDWORK OPPORTUNITIES

The practical content of our courses is significant, and stands you in good stead when competing for science-based careers. You will work in small groups, supervised by lecturers and demonstrators. The highlight for many students on our biology programmes is the practical field courses, offered throughout the degree. We see great value in the learning opportunities these provide and offer several, including:

- Coastal and Upland Habitats (Scarborough)
- Terrestrial Ecology and Behaviour (Malham, Yorkshire Dales)
- Marine Zoology (Dale Fort, Pembrokeshire)
- Mediterranean Ecology (Spain)
- South Africa (Great Fish River Nature Reserve)

See pages 22-23 for more information about fieldwork opportunities.

ADVANCED ACCREDITED DEGREES

Advanced Degree Accreditation by the Royal Society of Biology recognises academic excellence in the biosciences, and highlights degrees that educate the research and development leaders and innovators of the future. Advanced accreditation criteria require evidence that graduates from the programme meet defined sets of learning outcomes, including gaining a substantial period of research experience. For more information, see individual courses pages. www.fbs.leeds.ac.uk/undergraduate/accreditation www.rsb.org.uk

MEDICINE & HEALTH RELATED DEGREES

Doctors are not the only essential people involved in medicine. Teams of scientists, engineers and mathematicians work within the areas of medicine and health, helping to explain the spread of disease, finding better treatments and cures, and developing technology for more accurate diagnosis. You can choose from a variety of degree programmes, which can prepare you for a wide range of opportunities in scientific and non-scientific careers where you could make a major difference to the lives of patients.

With the expansion of the biosciences comes the generation of new and varied career opportunities. Some of our graduates go on to further study at Masters or PhD level. These have included PgD Physician Associate Studies, DMD Doctor of Medical Dentistry, BSc Adult Nursing, MSc Nutrition, MSc Control of Infectious Disease, MRes Neuroscience and PhDs in molecular and cell biology and cardiovascular disease.

Other career routes include graduate medicine, dentistry, the pharmaceutical and biotechnology industries, public health sector laboratories, university and government-funded institutes and health, medical, policymaking and government organisations.

Here are some of the exciting areas where students can contribute to medicine:

- Tissue engineering
- Gene therapy
- Drug design and discovery
- Synthetic biology
- Disease diagnosis
- Genetic analysis
- Understanding the mechanisms of disease
- Finding better treatments and cures to tackle infectious diseases
- Exercise and health.
Outstanding learning and teaching

Teaching takes place over three terms, divided into two semesters. You will have lectures each week, and regular laboratory and tutorial sessions. As a guide, a typical week in your first year will include 9 to 12 hours of lectures, three to six hours of practical sessions in the laboratory, tutorials, workshop and seminar sessions, plus private study.

In the final year, you will undertake a research project alongside lecture and tutorial-based modules. If you undertake the MBiol degree, you will study modules at Masters level, as well as completing an extended research project.

RESEARCH-BASED LEARNING
As a member of the prestigious Russell Group of research-intensive universities, the University of Leeds is dedicated to sharing the excitement of cutting-edge research with its students. Being taught by internationally renowned academics working at the forefront of their fields means that you will have the chance to find out about the latest research first-hand. These academics will share their passion for the subject with you. They will inspire you through their teaching and introduce you to the latest findings and discoveries in the biological sciences.

LABORATORY CLASSES
The practical content of our courses is high, which will stand you in good stead in competition for science-based careers. You will work in small groups supervised by lecturers and demonstrators.

TUTORIALS
Small-group teaching encourages active participation and understanding. It is also a good place to practise presentation skills.

LECTURES
We have modern lecture theatres, equipped with the latest audio visual and computer-based teaching aids. Lectures and other teaching sessions may be video-recorded to provide material for consolidation and revision.

DIGITAL LEARNING
We have invested over £2m in a new state-of-the-art lecture capture and multimedia management system. You’ll be able to access video and audio recordings of many of your lectures and other activities through the University’s Virtual Learning Environment (VLE).

RESEARCH PROJECTS
All our degrees offer students the opportunity to undertake an exciting final-year research project. You will have the chance to learn from and work with our world-class scientists in an academic or research environment. Our projects provide you with the opportunity to explore your subject in more detail and develop essential skills for the world of work: problem-solving, teamwork, management, leadership, decision-making, research and communication skills.
OUTSTANDING LEARNING AND TEACHING

ACADEMIC FACILITIES
You will have access to excellent facilities both within the Faculty and across the University. You will benefit from a contemporary, inspiring and well-equipped learning environment.

Other facilities include fermentation units, research-quality microscopes and molecular biology suites. If you’re on one of our School of Biology programmes, you may also have the chance to access the University farm, as well as regular fieldwork opportunities.

Our Library offers a variety of study environments. The Brotherton, Edward Boyle, Laidlaw and Health Sciences libraries – based in four buildings on campus – each house a different subject-based collection. Almost 4,000 study spaces are available, from silent individual study to vibrant group work areas. All our libraries have extensive computer facilities and are wireless-enabled throughout for mobile devices.

SUPPORTING OUR STUDENTS
We have a team of people dedicated to helping you make the transition to university as smooth as possible. Your personal tutor and the Student Education Office are there to ensure you get the most out of your time at Leeds and that you grow in confidence to become an independent learner. Our approach to student education has received resounding endorsement from our students, with a number of our degree courses achieving high scores for overall satisfaction in this year’s National Student Survey (NSS).

INTERNATIONAL COMMUNITY
The Faculty of Biological Sciences international community welcomes international students to the Faculty from all over the world, and will help you settle into Leeds and your studies. Being part of the community will help you adjust to living in a new place and will ease you into becoming part of the University. The community also provides a range of support for international students, both academic and personal. Find out more at www.fbs.leeds.ac.uk/internationalcommunity

90% of our final year students are satisfied with the overall quality of their course (The National Student Survey (NSS, 2016))
Careers and employability

In an increasingly competitive job market, our degrees can give you the edge and help you stand out by developing the knowledge and skills you need to succeed. There are also plenty of opportunities outside your studies to increase your chances of securing that all-important graduate job.

EXCELLENT DEGREE PROSPECTS

Our graduates have an excellent reputation amongst employers. The University is one of the UK’s top five universities targeted by employers according to the High Fliers report 2016. The Faculty is also ranked highest for employability amongst Russell Group universities.

INDUSTRIAL PLACEMENTS

All our degree courses offer you the opportunity to undertake a placement year as part of your degree. Placements abroad are possible. Industrial placements are typically taken between your second and final year. If you choose to undertake a placement year, this will extend your studies by 12 months. For your work placement in industry, staff at Leeds will help you with your CV and application letters and provide a list of organisations which may offer industrial placements.

We work with your industrial supervisors to make sure you get the most out of this year. A year working in industry gives you an excellent opportunity to get used to the demands of the world of work, to develop new skills and to augment your CV.

An industrial placement will help prepare you for graduate-level employment. Our students have taken work opportunities across a wide range of industries, including pharmaceuticals, biotechnology, food, biology testing laboratories, research institutes, environment, agriculture, leisure and health.

Most placements are UK based, although there is scope for placements abroad. This year students have undertaken a placement at a variety of institutions including:

- nal von minded GmbH, Germany
- Oregon Health and Science University, Canada
- Mayo Clinic, Florida
- Florey Institute in Melbourne, Australia
- Novartis, San Francisco
- Janssen, Belgium
- Wildlife Conservation Society, Brazil.

A comprehensive support programme exists for students pursuing a 12-month placement. A dedicated in-house system advertises hundreds of roles, and we provide lots of support to help you with your placement search, from lectures and workshops to handbooks and industrial guides.

www.fbs.leeds.ac.uk/courses/industrial

In an increasingly competitive job market, our degrees can give you the edge and help you stand out by developing the knowledge and skills you need to succeed. There are also plenty of opportunities outside your studies to increase your chances of securing that all-important graduate job.

Biology-related placements

- Banham Zoo
- Centre for Ecology and Hydrology (Edinburgh)
- Natural History Museum
- Royal Botanic Gardens, Kew

Sport and exercise science-related placements

- Oldham Football Club community project
- QinetiQ
- Sports and Physical Activity Office, University of Leeds
- Syngenta University of Western Australia

Lab-based placements (all programmes)

- Aeitec Medical Research
- Amersham Council
- AstraZeneca
- MedImmune
- Covance
- Novartis
- GlaxoSmithKline
- Pfizer
- Janssen
- Reckitt Benckiser
- Lilly
- Systagenix

96% of our graduates are employed or in further study six months after graduation (HESA 2016)
I decided to undertake a placement year to improve my employability after university by gaining relevant work experience on top of my degree. It also helped me decide what field I might want to go into after completing my degree.

I am currently working as an assistant ecologist at PBA Applied Ecology in Settle, North Yorkshire. I am responsible for assisting with reports for bat/crayfish surveys, inputting data and sorting sediment samples. The highlights of working at PBA are getting to meet new people with similar interests and being part of a passionate team.

Alex Moffatt, BSc Zoology (Industrial), Assistant ecologist at PBA Applied Ecology
School of Biology

Biology
Biology with Enterprise
Ecology and Conservation Biology
Genetics
Zoology

Our degree courses include topics at the cutting edge of biological discovery and reflect the complexity of the subject area, encompassing everything from molecules to populations of organisms.

Graduates from our degrees are essential in solving some of the key challenges of the modern world, whether dealing with issues of food security for a growing population in a sustainable way, or harnessing the potential of molecular genetics and biochemistry.
Biology is probably the most actively changing and developing subject area of all the sciences. The discovery of the structure of DNA more than 50 years ago has led to complete descriptions of genetic information for many organisms, enabling biologists to make rapid and significant advances in our understanding of all things related to biology.

- DNA technology is used as evidence in criminal prosecutions and to study extinct animals.
- The threat posed by viruses has led to intense activity to understand disease epidemiology.
- Threats to conservation and the degradation of our landscape and habitats have been matched by a greater understanding of the dependence of organisms on each other and the environment.

FLEXIBLE DEGREE CHOICES

The first year of our degree courses share the same set of compulsory modules, providing you with a broad foundation as a scientist. Then in Years 2, 3 and 4 you will undertake specialist modules according to your chosen degree course. A key benefit of having a common first year is that you can easily switch between our different degrees. There are also opportunities to transfer between the Biology, Biological Sciences and Microbiology programmes at the end of year 1.

CAREERS

Career destinations in the field of biology are wide ranging and employment prospects are excellent, with 96% of recent graduates having secured jobs or in further study within six months of graduating.

Recent graduates can be found working as, for example:
- Research bioscientist
- Wildlife filmmaker
- Biocontamination technician
- Senior species ecologist
- Senior plant health and seeds inspector
- Policy advisor: international
- Biodiversity
- Epidemiologist.

RESEARCH-BASED TEACHING

Our teaching is research based. In essence, that means learning from and working with top researchers who are pushing the boundaries of knowledge on a daily basis. The benefits of being taught by the same people who are involved in research are numerous: from inspirational lectures on real-life issues impacting modern society and undertaking fascinating final-year research projects through to hands-on involvement in industrial research laboratories through our laboratory placement schemes and fieldwork opportunities. The University owns its own working farm, which is an international centre for research into more sustainable soil management, and is hosting a major new investment supporting the commercial production of livestock by improving animal diets and living conditions. Discover more about our research at www.fbs.leeds.ac.uk/research

I love the fact the University gives us the flexibility to do modules from other courses. So, as a zoologist, I can take some ecology modules that I find interesting. My favourite modules so far have been Lives of Carnivores, a zoology module, and Vertebrate Evolution, which was an optional module from the School of Earth and Environment.

Karolina Zarzyczny, MBiol Zoology

www.fbs.leeds.ac.uk/undergraduate | 11
Biology

What is biology?

Biology is the study of life and living organisms. It’s a fascinating subject that answers key questions such as how life first began, and which offers developments and solutions to major social and ethical challenges. It has offered an advanced understanding of serious threats to human populations, conservation and habitats.

This course allows you to gain a broad understanding of molecular, cellular, organismal and population biology, as well as giving you the chance to specialise in areas that suit your interests through a wide range of optional modules. You’ll gain a broad understanding of genetics, immunology, microbiology and other key disciplines, while you could also choose to explore areas such as plant growth, conservation biology, population genetics, bioinformatics, and many more.

COURSE HIGHLIGHTS

• Biology is a wonderfully wide-ranging subject that Leeds is well equipped to deliver through one of the UK’s largest and most diverse biology research and teaching groups.

• The degree is popular – for some, it’s the breadth of the subject that appeals, for others it’s a path to specialisation.

• The common first year provides you with a broad foundation as a scientist, flexibility, and the opportunity to specialise in your chosen area in Years 2, 3 and 4.

• In each year you will choose modules from our specialist degrees across biology (Biology with Enterprise, Genetics, Ecology and Conservation Biology, and Zoology), allowing you to follow your own biological interests.

• Our MBiol and Industrial Placement Year programmes have received advanced degree accreditation by the the Royal Society of Biology.

BSc COURSE STRUCTURE

The modules taught in your first year reflect the complexity of life forms, from molecules through to organisms, plants and animals, to populations.

There is a residential field course in North Yorkshire where you will study coastal and upland habitats, and our research ethos is developed and fostered from the start through practicals and tutorials.

At the end of Year 1, there are opportunities to transfer between the Biology, Biological Sciences and Microbiology programmes.

In Year 2 you can take modules in the disciplines of applied biology, genetics, zoology, plant biology and ecology, which include human genetics, evolution, animal behaviour and parasitology. There are optional Yorkshire Dales and Mediterranean field courses. The degree offers the opportunity to take an industrial placement or a study abroad year at the end of Year 2, which will enhance your employment prospects.

In Year 3 you will study topics at the cutting edge of biological discovery in areas such as epigenetics, behavioural ecology and conservation biology. You will undertake your own independent research, literature or computer-based project.

There is also a popular optional South African field course. www.fbs.leeds.ac.uk/fieldcourses

INTEGRATED MASTERS (MBiol)

Years 1 and 2 are the same as for the BSc and provide a foundation in the subject. In Year 3 you study compulsory and optional modules, an individual research project and a literature review project.

In Year 4 you will study a range of Masters-level modules, such as Host-Parasite Interactions and Infectious Diseases, and undertake an extended research project. See page 25 for more information.
One of the best aspects of this course is the flexibility you have in module choices in your second and third year. This allows you to specialise and choose modules to suit you. It also has great field courses to Scarborough, Malham and South Africa (which I am going on at the start of third year), excellent laboratory facilities and brilliant support is provided by the personal tutors.

Leah Kelly,
BSc Biology (with Industrial Placement Year)

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## Degree Requirements

<table>
<thead>
<tr>
<th>Degree</th>
<th>A-level</th>
<th>GCSE</th>
<th>Subject requirements</th>
<th>UCAS code</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc Biology</td>
<td>AAA-AAB</td>
<td>Typically grade B in GCSE</td>
<td>Three A-levels including Biology and preferably another science or science-related subject. If Biology is the only science subject, an A grade in Biology is required. General Studies and Critical Thinking excluded.</td>
<td>C100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mathematics and grade C English.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBiol Biology</td>
<td>AAA</td>
<td></td>
<td>Three A-levels including Biology and another science or science-related subject. General Studies and Critical Thinking excluded.</td>
<td>C109</td>
</tr>
</tbody>
</table>

Other qualifications accepted. Please visit [www.fbs.leeds.ac.uk/undergraduate](http://www.fbs.leeds.ac.uk/undergraduate) for further information.

## CAREERS

Our biology graduates enter many different careers, including the pharmaceutical industry, agribusiness, conservation, media, science journalism, teaching, environmental consultancy and education. Many go on to specialise through further study such as a Masters or PhD.

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Watch our course video

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www.fbs.leeds.ac.uk/undergraduate | 13
Biology with Enterprise

What is biology with enterprise?

As a student on this course, you will gain a comprehensive understanding of the broad scope of biology and associated biotechnology together with the essentials of business and commerce. The degree is designed for biology students with an interest in business and industry. It brings together complementary skills across biology and enterprise in a coordinated fashion.

COURSE HIGHLIGHTS

- Developed in partnership with Leeds University Business School, one of the most respected and influential business schools in the UK.
- This is one of the first degrees at the University of Leeds combining subject-specific modules with a tailored programme of enterprise teaching.
- The degree will teach you biology that has impact together with an awareness of commercial opportunities, allowing you to implement your biological knowledge for the benefit of society across a wide range of employment options.
- The common first year provides you with a broad foundation as a scientist, flexibility, and the opportunity to specialise in your chosen area in Years 2, 3 and 4.

BSc COURSE STRUCTURE

Year 1 provides an introduction to several core themes related to biology, including molecular and cell biology, microbiology, genetics and immunology, together with a skills module which develops practical and data-handling skills through weekly laboratory classes and tutorials. You will have the opportunity to go on field courses to study biology in the environment. Alongside these modules, you will study the processes involved in strategic business planning and management.

In Year 2, you will continue to study biology and the continued development of your skills will be supported through modules that integrate regular tutorials, laboratory practicals and data-handling exercises. You will also gain a more focused insight into the essential elements of the business world.

In Year 3 you will continue a coordinated programme of biology and enterprise to develop a broad range of skills. There is strong emphasis on independent learning, problem-solving and data analysis taught in the context of biology. You will complete an extended individual project as part of a research group in the School of Biology.

You will also continue to develop your understanding of business practices in preparation for your project in enterprise.

PROJECTS

Projects provide an excellent opportunity to explore a subject further and enable you to develop essential skills such as problem-solving, communication and teamwork, all vital to success in your future career.

Projects cover all aspects of biology including molecular and cellular biology, genetics, animal and plant development, animal and plant nutrition, plant physiology and ecology. Additionally, projects are available in the Business School.

INTEGRATED MASTERS (MBiol)

You can study the Biology with Enterprise degree as a MBiol. Years 1 and 2 are the same as for the BSc and provide a foundation in both Biology and Enterprise management. In Year 3 you study compulsory and optional modules in both biology and enterprise, together with an Enterprise Development Project. In Year 4 you will study a range of Masters-level modules and undertake an extended research project. See page 25 for more information.
## Degree Requirements

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</tr>
</thead>
<tbody>
<tr>
<td><strong>BSc Biology with Enterprise</strong></td>
<td>AAA-AAB</td>
<td>Typically grade B in GCSE Mathematics and grade C English.</td>
<td>Three A-levels including Biology and preferably another science or science-related subject. If Biology is the only science, an A grade in Biology is required. General Studies and Critical Thinking excluded.</td>
<td>C1N1</td>
</tr>
<tr>
<td><strong>MBiol Biology with Enterprise</strong></td>
<td>AAA</td>
<td></td>
<td>Three A-levels including Biology and another science or science-related subject. General Studies and Critical Thinking excluded.</td>
<td>C1N2</td>
</tr>
</tbody>
</table>

Other qualifications accepted. Please visit [www.fbs.leeds.ac.uk/undergraduate](http://www.fbs.leeds.ac.uk/undergraduate) for further information.

## CAREERS

Biology is a wide-ranging subject that can take you into many occupations with companies in the private sector or as part of government institutions and departments. Biology with Enterprise leads to a similar breadth of careers but gives you the additional knowledge of business principles. Careers can be found in large multinational organisations, national companies and smaller enterprises, and in government sectors such as the NHS or the civil service including DEFRA, all of which operate under economic constraints. Biology with Enterprise allows for graduates to continue to deliver biology, with opportunities in careers such as medical scientists, biotechnologists, teachers, ecologists, neurobiologists, dieticians, agricultural scientists, conservationists, geneticists, veterinary scientists and the media, to name a few.

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**“I enjoy the diversity of my course; I am not tied to one subject. The course offers the opportunity to explore various aspects of biology such as genetics and agriculture, as well as gaining an understanding of social enterprise and learning how to be successful in business. I think that the combination of business and biology will give me a real advantage once I’ve graduated because I will be able to combine the skills acquired from each subject.”**

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Kiera Emmott,  
BSc Biology with Enterprise
Ecology and Conservation Biology

What is ecology and conservation biology?

With human activity increasingly transforming the planet, it’s never been more important to understand what determines the distribution and abundance of different species, how they interact with each other and their environment, and how they respond to threats such as climate change, over-exploitation and habitat destruction. This course provides you with practical insights into these processes and how to manage them to conserve species and ecosystems in a rapidly changing world.

COURSE HIGHLIGHTS

• The course is delivered by internationally recognised staff, drawing on their expertise at the cutting edge of research in ecology and conservation. You will also have the opportunity to work with geographers and environmental biologists on a range of interdisciplinary topics.

• We offer a range of residential field courses throughout the programme, where you can gain first-hand experience of different ecosystems and learn key research skills in the field.

• The common first year provides you with a broad foundation as a scientist, flexibility, and the opportunity to specialise in your chosen area in Years 2, 3 and 4.

• The course combines a structured programme of core modules to ensure a good grounding in the topic, with the flexibility to specialise in the areas that most interest you.

• Our graduates leave with a strong portfolio of practical skills, including project management, data analysis, communication skills and group working, making them ideally placed for further study or employment.

• Our MBiol and Industrial Placement Year programmes have received advanced degree accreditation by the Royal Society of Biology.

BSc COURSE STRUCTURE

Year 1 covers a wide range of topics, including biodiversity, evolution, ecological issues and genetics, as well as optional modules such as Vertebrate Evolution in the Schools of Geography and Earth and Environment. The residential field course in North Yorkshire is a highlight of the year. You will be introduced to the exciting world of scientific research right from the start.

In Year 2 you will focus on core issues in ecology and conservation biology, including population and community ecology, animal behaviour and evolution, as well as taking a residential field course on Mediterranean ecology in southern Spain and an optional terrestrial ecology and behaviour field course in the Yorkshire Dales. Optional modules include Animals as Pests and Sustainable Food Production. The degree offers the chance to take an industrial placement or a study abroad year at the end of Year 2, which will enhance your employment prospects.

In Year 3 you will complete an independent research project and take advanced modules in Ecology and Conservation Science. There is an optional field course to South Africa.

Watch our course video
INTEGRATED MASTERS (MBiol)

Our MBiol offers the chance to study key topics in ecology and conservation, such as climate change and sustainable agriculture, to Masters level.

Years 1 and 2 are the same as for the BSc. In Year 3, as well as studying a range of core and optional modules, you will carry out a literature review and learn advanced research techniques in preparation for Year 4.

<table>
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<tbody>
<tr>
<td>BSc Ecology and Conservation Biology</td>
<td>AAA-AAB</td>
<td>Typically grade B in GCSE Mathematics and grade C English.</td>
<td>Three A-levels including Biology and preferably another science or science-related subject. If Biology is the only science subject, an A grade in Biology is required. General Studies and Critical Thinking excluded.</td>
<td>C180</td>
</tr>
<tr>
<td>MBiol Ecology and Conservation Biology</td>
<td>AAA</td>
<td></td>
<td>Three A-levels including Biology and another science or science-related subject. General Studies and Critical Thinking excluded.</td>
<td>C189</td>
</tr>
</tbody>
</table>

CAREERS

Graduates in Ecology and Conservation Biology go on to do many different things. Some remain in academia and choose to further their studies at Masters or PhD level. Others go on to careers in conservation, ecological research or environmental consultancy, while the practical skills provided by this degree are ideally suited to a wide range of professions including journalism and teaching.

“Ecology at Leeds was the course that appealed to me by far the most. I liked the sound of the amount of research and the field trips offered. There is a great balance at Leeds between research and theory.

I’m fascinated by the connections between organisms and the environment, and the whole course is taught really well by lecturers who are clearly actively involved in research and are at the cutting edge of their respective fields. Leeds lives up to its Russell Group heritage; all the course content is so up to date.

Sam Ross, MBiol Ecology and Environmental Biology (Photographed in the Aquatic Animal Behaviour lab)"
Genetics

What is genetics?

Genetics is the comprehensive study of the nature, transmission and expression of genetic information in living organisms, as well as the applications of genetic techniques in fields as diverse as genetic engineering, developmental biology, biotechnology, diagnostics, therapies for human diseases and conservation biology.

COURSE HIGHLIGHTS

- We offer specialised genetics modules in the areas of applied genetics, human genetic disorders, epigenetics, population genetics, developmental genetics, cancer genetics and cell cycle control, taught by research leaders.

- The common first year provides you with a broad foundation as a scientist, flexibility, and the opportunity to specialise in your chosen area in Years 2, 3 (and 4).

- Our students have held placements at organisations as varied as GlaxoSmithKline and the Royal Botanic Gardens, Kew.

- Our MBiol and Industrial Placement Year programmes have received advanced degree accreditation by the Royal Society of Biology.

In Year 2 the focus is more specifically on genetics, with compulsory modules in genetic engineering, bacterial genetics, bioinformatics, human genetics and developmental biology. The degree offers the opportunity to take an industrial placement or study abroad year at the end of Year 2, which will help broaden your experience, enhance your skills and improve your employment prospects.

In Year 3 specialised genetics subject areas are taught in a research-based environment. You will also undertake an independent research project supervised by one of our research staff.

INTEGRATED MASTERS (MBiol)

Years 1 and 2 are the same as for the BSc and provide a foundation in the subject. In Year 3 you study compulsory and optional modules, an individual research project and a literature review project.

In Year 4 you will study a range of Masters-level modules (for example, High-throughput Technologies, Plant Biotechnology, Conservation Genetics) and will undertake an extended research project. See page 25 for more information.

Watch our course video
I’m currently working at St George’s Hospital in London, where I am a booking coordinator for outpatient appointments in the Neurology and Neurosurgery Department. It’s taken me quite a while to decide what do in my career, but I’m planning on applying for trainee medical sales programmes. I’m a sociable person and I love to talk to people. I’ve also considered midwifery, graduate medicine and NHS management as careers. The good thing is you get a lot of choice when you’ve got a scientific degree, so you could do almost anything you want.

So far, the highlight of my working life has been going to watch brain surgery (an awake craniotomy) on a real-life patient who had a brain tumour. The main lesson that I have learnt since graduating is that it doesn’t matter what you’re doing or how ‘good’ your job is, you still open a lot of doors for yourself and get opportunities that might take you elsewhere.

Bethany Leake,  
BSc Genetics Alumna  
(Photographed in the Health Sciences Library)  
uk.linkedin.com/in/bethanyleake

**CAREERS**

Recent graduates have entered careers including genetics research, genetic counselling, scientific publishing and science journalism, sales and management in science-related industries, teaching, scientific administration and science policy development.

Many students go on to Masters or PhD study. Our degree prepares you for a wide range of opportunities in scientific and non-scientific careers. Graduate prospects are excellent in the area of genetics, leading to high levels of graduate employment following the course. Recent graduate destinations include:

- Genetic counsellor assistant, NHS
- Senior analyst, loans specialist advisory services
- Genetics technologist, Central Manchester Foundation Trust
- Biomedical support worker, St James’s Hospital
- Health care assistant, Kings’ College Hospital.
Zoology is the study of animals at all levels, from their evolutionary origins, molecular and cellular biology to their behaviour, ecology, and evolution. Zoologists conduct research in the laboratory and field to address wide-ranging issues in conservation biology, animal welfare, farming, disease, and government policy.

COURSE HIGHLIGHTS

- Zoology at Leeds is taught by some of the leading scientists in their fields and offers you an exceptional degree in whole-organism zoology.

- The diversity and strength of our staff expertise means that we offer courses at all levels, from genetics and cell biology, through whole-organism biology, to animal behaviour, ecology, evolution and conservation, with an exceptional range of choice of modules in different areas.

- Our research-based teaching means you will learn about cutting-edge research and current developments in the field of zoology, and there are opportunities in all three years to undertake research projects.

- Field courses are key to understanding how animals live and interact in their natural environment. The Zoology degree at Leeds is exceptional in that it offers residential field course opportunities in all years of study. These cover diverse habitats, from coasts and uplands in the UK to a wildlife reserve in South Africa. See pages 22-23 for more information about fieldwork opportunities.

- Develop diverse skills to equip you for further study or employment in a range of careers.

- The common first year provides you with a broad foundation as a scientist, flexibility, and the opportunity to specialise in your chosen area in Years 2, 3 and 4.

- Our MBiol and Industrial Placement Year programmes have received advanced degree accreditation by the Royal Society of Biology.

BSc COURSE STRUCTURE

In Year 1, core modules describe how zoological research can address global challenges such as food security, invasive species and biodiversity conservation, using approaches from genetics and whole-organism biology to ecology and fieldwork. A strong emphasis on the application of fundamental research allows students to experience the exciting world of scientific research right from the start. Year 2 covers core zoology, including animal behaviour, development, evolution and physiology. There is a marine zoology field course, and optional field courses in Mediterranean ecology, and in UK ecology and behaviour, each including research projects.

Year 3: a highlight of your third year is your own independent research project. Diverse projects reflect the expertise of our staff, with study systems involving birds, whales, invasive species, parasites, crop pests and farm animals. Projects can be field, lab, literature or computer based and our best students publish their projects as scientific papers. Study topics at the cutting edge of zoological research include the evolution of animal culture, behavioural ecology, conservation, animal science and bird behaviour. There is a popular optional field course in South Africa.
INTEGRATED MASTERS (MBiol)

Years 1 and 2 are the same as for the BSc and provide a foundation in the subject. In Year 3 you study compulsory and optional modules and undertake an independent research project. You will also conduct a literature review in preparation for your extended project in your fourth year. Key to Year 4 is your independent project during which you will join a lab at the cutting edge of research. You will also chose Masters-level modules such as Population Dynamics, Infectious Diseases, and Conservation Genetics. See page 25 for more information.

Degree  | A-level | GSCE | Subject requirements | UCAS code |
---------|---------|------|----------------------|-----------|
BSc Zoology | AAA-AAB | Typically grade B in GCSE Mathematics and grade C English. | Three A-levels including Biology and preferably another science or science-related subject. | C300 |
MBiol Zoology | AAA | | Three A-levels including Biology and preferably another science or science-related subject. | C309 |

Other qualifications accepted. Please visit www.fbs.leeds.ac.uk/undergraduate for further information.

CAREERS

Zoology graduates have:
- Continued to further study (MSc, PhD)
- Joined practical conservation agencies (wildlife trusts, zoos)
- Joined government departments (Environment Agency, Defra)
- Worked in the media
- Worked in laboratory research or environmental consultancy
- Developed careers in areas including law and business.

Watch our course video
One of the most exciting aspects of our degrees is the range of opportunities for fieldwork on offer. Field courses offer valuable opportunities to apply your knowledge and practical research skills outside the lab, so we offer at least one option of a field course in every year.

YEAR 1: COASTAL AND UPLANDS HABITATS, SCARBOROUGH, NORTH YORKSHIRE
A week’s in-depth study of animals and plants in their natural habitats. Students are allocated to a group and each group has its specialist topic. For example, you may explore diurnal rhythms in insects, rocky shore diversity, seaweed ecology or how parasitic disease affects grouse populations on the North York Moors. We take a trip to the RSPB nature reserve at Bempton. These towering chalk cliffs are home to 250,000 birds including gannets, guillemots and puffins (and an ice cream stand!).

YEAR 2: TERRESTRIAL ECOLOGY AND BEHAVIOUR, MALHAM TARN, YORKSHIRE DALES
This course is based at Malham Tarn in the Yorkshire Dales, an internationally important reserve in a spectacular limestone landscape with a wide variety of terrestrial and freshwater habitats. Projects include echolocation and foraging patterns of bats, territoriality and habitat preferences of woodland birds, the ecology of carnivorous plants, cave spiders and limestone pavement ecology.

YEAR 2: MARINE ZOOLOGY FIELD COURSE, DALE FORT, PEMBROKESHIRE
The beautiful Pembrokeshire coast offers us unparalleled biodiversity on sandy shores, rocky shores and mudflats. A key feature is that we use a range of disciplines. We explore the developmental biology of marine animals, their evolution and adaptations to the challenges of marine life, their behavioural interactions and community ecology. Students also design group projects: examples include in vitro fertilisation in limpets, sea squirt development, vigilance behaviour in shorebirds, antipredator jumping in shrimps and aggression in crabs.

YEAR 2: MEDITERRANEAN ECOLOGY FIELD COURSE
Usually involving a trip to the Iberian Peninsula, this course allows you to explore issues surrounding biodiversity conservation across Europe, including the challenges of growing human populations and habitat restoration.

YEAR 3: AFRICAN ECOLOGY FIELD COURSE, SOUTH AFRICA
This exciting field course is based at the Shamwari Game Reserve in the Eastern Cape of South Africa. The area is rich in plants, birds and mammals (including the ‘big five’ – elephant, rhino, buffalo, lion and leopard). Group projects designed by the students centre on the theme of a ‘landscape of fear’, and there are also guest lectures by local experts, a bird diary to complete, night drives in safari vehicles and a boat trip to watch birds and sometimes even whales.

YEAR 4: (MBIOL) MPALA RESEARCH CENTRE, KENYA FIELD COURSE
On the MBIol Biology, Ecology and Zoology programmes there is the option to visit the Mpala Research Centre in Kenya in your fourth year. This field course aims to provide practical, first-hand experience of field research in Africa, with a focus on ecological, conservation and wildlife management challenges in a semi-arid savannah environment. The course will be based primarily around small-group projects that are of ecological or conservation relevance to the region. This will reinforce and broaden your knowledge and understanding of the area and build upon aspects of the ecological training received at Leeds.
I had the chance to travel to South Africa, which was amazing from start to finish and a highlight of not just the course but of life in general. We saw lions, black rhinos, elephants, giraffes and mountain zebras. I also had the opportunity to go to Spain, which gave me my first chance to learn how to ring and handle wild birds – a skill I have gone on to use since graduating. If I was talking to a student who was finding it difficult to choose between universities, I’d definitely tell them to choose a course within the biological sciences at Leeds.

Christopher Heward,  
BSc Ecology and Environmental Biology

The highlights of my time at Leeds have definitely been the field courses to Scarborough the first year and Malham in second year, as well as the incredible friends that I have made on my course.

Leah Kelly,  
BSc Biology

The field trips are educational, good fun and have helped me to make long-term friends.

Alex Moffatt,  
BSc Zoology

www.fbs.leeds.ac.uk/undergraduate | 23
I chose University of Leeds because it is well known for having a really student-friendly and international-student-friendly environment. Plus, Leeds has plenty of societies to join and gain experience, from sports to art-based activities so you can get your heads off academic things for a while and do something different.

Nazatul Awang Abd Ghani, BSc Biology
Integrated Masters (MBiol) Biology

All our MBiol programmes have been awarded advanced degree accreditation*, which recognises academic excellence in the biosciences.

**Year 1 and 2** are the same as for the corresponding BSc degree and provide a foundation in the subject. In **Year 3** you study compulsory and optional modules, as in the BSc, and also undertake a short research project and a literature review designed to prepare you for the major research project in the fourth year.

In **Year 4**, you can choose from a range of Masters-level modules and conduct an extended project. A core part of your fourth year is the extended research project, with projects reflecting our diverse expertise.

* except for Biology with Enterprise

In **Year 4** you will select from a range of Masters modules, such as Conservation Genetics and Population Dynamics, while modules in Advanced Statistics and GIS provide a chance to develop advanced skills. There is an optional Africa field course in the savannah in Kenya.

You will also undertake an extended research project on an original, cutting-edge topic specific to Biology, Biology with Enterprise, Ecology, Genetics or Zoology. This project will develop your research skills in greater depth and achieve substantial subject-specific specialisation, preparing you for a career in scientific research.

As a biologist on our MBiol programmes, you will have access to our discipline-leading research facilities in our newly refurbished laboratories: confocal fluorescence and electron microscopes, equipment for molecular genetic analyses and tissue culture, and whole-organism growth facilities. You will also have access to field study sites around the world. You will work alongside experienced research scientists as part of a thriving research team.
# FACULTY OF BIOLOGICAL SCIENCES

## MODULLES

### Year 1 (BSc) 120 credits

All of our programmes share a common core first year, comprising the modules below. The first year will provide you with a broad foundation in biology and allows flexibility to transfer between degree programmes. For more information on typical modules visit the website.

<table>
<thead>
<tr>
<th>Ecology</th>
<th>Zoology</th>
<th>Biology</th>
<th>Biology with Enterprise</th>
<th>Genetics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

### Compulsory modules

<table>
<thead>
<tr>
<th>Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Basis of Life</td>
</tr>
<tr>
<td>Introduction to Genetics</td>
</tr>
<tr>
<td>Tutorials for Biology and Genetics</td>
</tr>
<tr>
<td>Biology Practicals and Data Analysis</td>
</tr>
</tbody>
</table>

### Optional modules

In addition you will choose from a wide range of optional modules or an elective 'Discovery module' for example:

- Multicellular Systems
- How can Biological Sciences change the world
- Introduction to Microbiology
- Introduction to Pharmacology
- Introduction to Immunology
- Biology of the Mind
- Introduction to Sport and Exercise Psychology
- Exploring Animal Behaviour
- Introduction to Environmental Sustainability
- Vertebrate Evolution
- Environment & Ecology
- Introduction to Meteorology and Weather Forecasting
- Introduction to Creating Sustainable Futures
- Introduction to Management
- Innovation & Creativity in Business
- Understanding Social Enterprise
- Career & Professional Development for Life Scientists
- Coastal and Upland Habitats Field Course (for genetics students)
### Year 2 (BSc) 120 credits

You will take the programme-specific compulsory (✓) and optional modules (O) as shown below. For more information on typical modules visit the website.

<table>
<thead>
<tr>
<th>Module</th>
<th>Ecology</th>
<th>Zoology</th>
<th>Biology</th>
<th>Biology with Enterprise</th>
<th>Genetics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhanced Study Skills for Biologists</td>
<td></td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Research Experience and Skills Level 2</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>How Plants Work</td>
<td>0</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Animal Physiology: from Ants to Whales</td>
<td>0</td>
<td>✓</td>
<td>✓</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Organismal Evolution</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Experimental Design and Analysis</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Parasitology</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Animal Nutrition and Metabolism</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Sustainable Food Production</td>
<td>0</td>
<td></td>
<td>0</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Animals as Pests</td>
<td>0</td>
<td></td>
<td>0</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Population and Community Ecology</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Animal Behaviour</td>
<td>✓</td>
<td>✓</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Animal Development Biology</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>0</td>
<td>✓</td>
</tr>
<tr>
<td>The Power of Bacterial Genomics</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Genetic Engineering</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>✓</td>
</tr>
<tr>
<td>Human Genetics</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>✓</td>
</tr>
<tr>
<td>Introduction to Bioinformatics</td>
<td>0</td>
<td></td>
<td>0</td>
<td>0</td>
<td>✓</td>
</tr>
<tr>
<td>Entrepreneurship in Theory and Practice</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>New Enterprise Planning</td>
<td></td>
<td></td>
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<td>✓</td>
<td></td>
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<tr>
<td>Marine Zoology Field Course</td>
<td></td>
<td></td>
<td>✓</td>
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<tr>
<td>Mediterranean Field Course</td>
<td>✓</td>
<td></td>
<td>0</td>
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<tr>
<td>Terrestrial Ecology and Behaviour Field Course</td>
<td></td>
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<tr>
<td>Discovery modules</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>

Depending on your course, you can choose from a further range of optional modules:

- Human Populations
- Climate Change: Science and Impacts
- Climate Change: Society and Human Dimensions
- Computer Systems and Programming Biological
- Membranes and Cell Signalling
- Human Diseases
- History of Genetics
- Cell Biology of Disease
- Employment, Career planning and Professional Development for Life Scientists
- Skills in Communicating Research beyond the University
- Biological Membranes & Cell Signalling
- Human Diseases
- Neurobiology
- Chemotherapy
- Introduction to Toxicology
- Principles of Drug Discovery
- Medical Virology
- Medical Immunology
- Managing Innovation in Business
- Innovating Social Enterprises
## Year 3 (BSc) 120 credits

You will take the programme-specific compulsory (✓) and optional modules (O) as shown below. For more information on typical modules visit the website.

<table>
<thead>
<tr>
<th>Module</th>
<th>Ecology</th>
<th>Zoology</th>
<th>Biology</th>
<th>Biology with Enterprise</th>
<th>Genetics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Project</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Research Literature Review and Poster</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Comparative Genomics</td>
<td></td>
<td></td>
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<tr>
<td>Evolution &amp; Population Genetics</td>
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<tr>
<td>Applied Genetics</td>
<td></td>
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<td></td>
<td>✓</td>
</tr>
<tr>
<td>Advanced Topics in Human Genetics</td>
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<td>✓</td>
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<tr>
<td>Epigenetics</td>
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<tr>
<td>Plant Developmental Biology</td>
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<tr>
<td>Applied Plant Science</td>
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<tr>
<td>Animal Developmental Biology</td>
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<td></td>
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<tr>
<td>Applied Animal Science</td>
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<tr>
<td>Animal Nutrition Science</td>
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</tr>
<tr>
<td>Conservation Biology</td>
<td>✓</td>
<td></td>
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<tr>
<td>Social Insect Biology</td>
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<tr>
<td>Advanced Topics in Zoology</td>
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<tr>
<td>Advanced Topics in Behaviour: from sex to death</td>
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<tr>
<td>Advanced Topics in Evolution</td>
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<tr>
<td>Level 3 Field Course (South Africa)</td>
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</tr>
<tr>
<td>Advanced Topics in Ecology</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Behavioural Ecology: Sex &amp; Parasites</td>
<td></td>
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<tr>
<td>Plant Growth, Resources and Food Security</td>
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<tr>
<td>Advanced Entrepreneurship</td>
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<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Enterprise Development Project</td>
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<td>✓</td>
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<tr>
<td>Biology Research Projects</td>
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<tr>
<td>Discovery modules</td>
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</tbody>
</table>

In addition to the optional modules above Ecology and Conservation Biology, Biology with Enterprise and Genetics students can choose from the following list of modules:

**Ecology and Conservation Biology**
- The Earth as an Integrated System
- Soils and Environmental Change
- Law and the Environment: Development and Nature Conservation
- Environmental Risk: Science, Policy and Management
- Dynamics of Weather Systems
- Earth Observations from Space

**Genetics**
- Cancer Biology

**Biology with Enterprise**
- Managing Innovation in Business
- Innovating Social Enterprises
Year 4 (MBiol) 120 credits

Our MBiol provides you with an excellent breadth and depth of knowledge in your chosen area. You will undertake an extended Masters-level 80 credit research and 40 credits of additional Masters-level taught modules. You will take the programme-specific compulsory (✓) and optional modules (O) as shown below. For more information on typical modules visit the website.

<table>
<thead>
<tr>
<th>Module</th>
<th>Ecology</th>
<th>Zoology</th>
<th>Biology</th>
<th>Biology with Enterprise</th>
<th>Genetics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extended Research Project</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Conservation Genetics</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>Community Ecology</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population Dynamics</td>
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Biomedical sciences is a fast-moving and exciting research area that concentrates on the fundamental biology responsible for human health and diseases. Our courses incorporate many disciplines, including anatomy, physiology, neuroscience and pharmacology, as well as some elements of biochemistry, immunology, pathology and microbiology.

By providing an understanding of how a healthy individual functions and identifying the mechanisms underlying disease, the ultimate aim of the biomedical sciences is to provide innovative new ways to treat human ailments.

Using the latest science and technology, the biomedical sciences continue to make major advances in medical diagnosis and treatment. Advances such as the ability to generate stem cells from an individual patient, or deliver genes to treat genetic disorders, mean that treatments for diseases previously thought incurable may now be just around the corner. These advances offer the promise of new treatments for diseases such as diabetes, heart disease, cancer and Alzheimer’s disease.

Our BSc with Industrial Placement Year programmes have received advanced degree accreditation by the the Royal Society of Biology.
RESEARCH-BASED TEACHING

As a student in the Faculty you will be taught by leading academics to ensure you get the most up-to-date perspective on the subject. You will have the opportunity to work in the laboratories and participate in research activities through our summer studentship scheme.

As part of your final-year research project, you can take part in the Science and Society initiative. Students are invited to take research conundrums and ethical dilemmas into schools for pupils to grapple with, engaging young people with the Faculty’s research while also developing key skills that employers value.

Discover more about our research
www.fbs.leeds.ac.uk/research

FLEXIBLE DEGREE CHOICES

The first year of many of our degree courses share the same set of compulsory modules, providing you with a broad foundation as a scientist. Then, in your second, third and fourth years, you will undertake specialist modules according to your chosen degree course.

A key benefit of having a common first year is that you can easily switch between some of our different degrees. The modular structure of our degrees provides you with both core elements and optional modules that give you the flexibility to tailor your course to your interests and career plans.

CAREERS

Careers in the field of biomedical sciences are wide ranging and employment prospects are excellent. 96% of our graduates are employed or in further study six months after graduation.

Our courses cover a range of areas, including anatomy, physiology, neuroscience, pharmacology, and they are attractive to those who want to pursue careers relating to medicine, healthcare, physiotherapy, medical and paramedical training.

Recent graduates can be found working as, for example:
- Drug safety scientist
- Biomedical scientist
- Clinical study manager
- Diabetes care specialist
- Senior clinical research associate
- European medical affairs manager
- Medical officer, RAF
- Cardiac physiologist
- Head of donor programmes
- Analytical chemist.

My year in industry was at GlaxoSmithKline, working in one of their pharmaceutical labs. The University really supported me with getting the placement – I not only went to the Careers Centre, where I had my CV and application checked over, but I also went to my personal tutor and to the Undergraduate Office to get their opinions and advice.

I think a placement year is invaluable – you gain so many skills and experiences. And when you come back to University, you have so much more confidence, understanding and motivation.

Just make the most of everything, that would be my advice. I've tried to get involved in so much co-curricular stuff. I've been president of the Faculty of Biological Science Society, clinical coordinator for Leeds Bone Marrow Society and I've done a blog for the Careers Centre. Getting involved in things outside your course gives you great experiences and it looks good on your CV!

Laura Riggal,
BSc Medical Sciences (Industrial)
Human Physiology

What is human physiology?

Human physiology is the study of how the body works in health and disease, and is a key component of the scientific basis of medicine. Throughout the degree, we consider, through research in academic or industrial settings, what happens when normal physiological mechanisms go wrong, and how conditions such as diabetes, obesity, cardiorespiratory and neurodegenerative diseases develop.

COURSE HIGHLIGHTS

- Our approach to human physiology is an integrative one, ranging from how whole organs work and interact to control body functions down to the molecular mechanisms operating within cells.
- You will acquire key practical, analytical and communication skills to enable you to analyse and present scientific data.
- The programme enables you to develop a range of key transferable skills such as computing (ICT), communication and problem-solving.
- Our BSc with Industrial Placement Year programme has received advanced degree accreditation by the Royal Society of Biology.

BSc COURSE STRUCTURE

The first two years of the programme provide an overview of how the different body systems function. You will enhance your understanding by studying subjects that complement physiology, such as neuroscience, pharmacology and cell biology. Practical classes use a wide variety of experimental approaches, from molecular and cell biology to the recording of blood pressure and electrocardiograms.

It may be possible to transfer to Pharmacology, Neuroscience or Medical Sciences after Year 1 (subject to academic approval). The degree offers the opportunity to take an industrial placement or study abroad year at the end of Year 2, subject to academic performance, which will help broaden your experience, enhance your skills and improve your employment prospects.

In Year 3, you have the opportunity to study your chosen areas of interest in more depth through a variety of modules that broadly reflect the research expertise at Leeds.

These modules include Advanced Scientific Skills and Advanced Topics in Physiology. You will also undertake an independent or group research project, which may be laboratory or literature based.

INTEGRATED MASTERS (MBIOL)

Years 1 and 2 are the same as for the BSc and provide a foundation in the subject. In Year 3 you study compulsory and optional modules, a literature research project and a research preparation module that will underpin your final-year research project. In Year 4 you will undertake an extended research project throughout the year alongside exploration of specialised research topics and skills. See page 43 for more information.
The University of Leeds is one of the top ranking universities in my special field of study. I almost enjoyed everything, but if I were to name something in particular, it is definitely having the opportunity to access to the dissection room and being able to learn more and more about the characteristics of the human body and how its different organs function.

Esra Shitaw, BSc Human Physiology
International student from Libya

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<tr>
<th>Degree</th>
<th>A-level</th>
<th>GSCE</th>
<th>Subject requirements</th>
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<tr>
<td>BSc Human Physiology</td>
<td>AAA-AAB</td>
<td>Typically grade B in GCSE</td>
<td>Three A-levels including Biology/Human Biology or Chemistry, plus another science or</td>
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<tr>
<td>MBiol Human Physiology</td>
<td>AAA</td>
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Other qualifications accepted. Please visit www.fbs.leeds.ac.uk/undergraduate for further information.

CAREERS

Typical graduate destinations include medically related careers such as graduate-entry medicine or physiotherapy courses and paramedical training. Other graduates continue to Masters or PhD study, academic research or teaching.

Watch our course video
Medical Sciences

What is medical sciences?

Our medical sciences degree is aimed at students with a broad interest in the science of human beings, from the level of molecular activity inside cells to the holistic behaviour of individuals. You will gain an integrated knowledge of the human body and how it works in health and disease.

COURSE HIGHLIGHTS

• The course provides a solid foundation in core biomedical subjects such as anatomy, physiology, pharmacology and neuroscience.

• Develop a wide range of practical training in the laboratory, including hands-on anatomy.

• There is also the opportunity to study in additional areas such as medical microbiology, medical immunology and cancer biology.

• Our BSc with Industrial Placement Year programme has received advanced degree accreditation by the Royal Society of Biology, as has the associated MBiol programme.

• You have the ability to customise your degree due to the wide range of modules available.

BSc COURSE STRUCTURE

The programme equips you with a wide range of knowledge and also transferable skills. It is a sensible choice if you know you are interested in biomedical subjects but do not want to decide on specialisation, at least in the first year.

In Year 1, you will be introduced to the range of topics making up the medical sciences. This will include basic anatomy, physiology, microbiology and pharmacology, as well as endocrinology and neuroscience.

It may be possible to transfer to Pharmacology, Neuroscience or Human Physiology after Year 1 (subject to academic approval).

In Year 2, you will receive more detailed exposure to the systems of the body, taught in an integrated way that brings together normal structure and function with changes in disease and treatment. You will have the opportunity to choose from a range of modules relevant to the course, including experimental techniques.

The degree offers the opportunity to apply for an industrial placement or study abroad year at the end of Year 2, which will help broaden your experience, enhance your skills and improve your employment prospects.

In the final year, you will select research-based modules that build on topics that interested you in earlier years.

You will undertake an individual or group laboratory or literature research project, which provides an opportunity to work alongside professional researchers undertaking cutting-edge work in specialised laboratories.

INTEGRATED MASTERS (MBiol)

Years 1 and 2 are the same as for the BSc and provide a foundation in the subject. In Year 3 you study compulsory and optional modules, a literature research project and a research preparation module that will underpin your final-year research project. In Year 4 you will undertake an extended research project throughout the year alongside exploration of specialised research topics and skills. See page 43 for more information.

CAREERS

Many students go on to postgraduate entry medical or dental courses, while other graduates further develop their research skills by doing a PhD. The Medical Sciences degree is also attractive to those who envisage careers related to healthcare or medical research.

Examples include laboratory or clinical research, management in healthcare organisations and diagnostic roles (including the NHS Scientist Training Programme). Within the pharmaceuticals industry, our graduates are involved in roles ranging from research and development of new drugs to clinical trials and medicines safety.

With a strong focus on wider skills such as data handling, problem-solving and communication skills, our graduates are also well equipped for a range of other careers.
### School of Biomedical Sciences

Undergraduate Degrees 2018

**Degree** | **A-level** | **GSCE** | **Subject requirements** | **UCAS code**
--- | --- | --- | --- | ---
BSc Medical Sciences | AAA-AAB | Typically grade B in GCSE Mathematics and grade C English. | Three A-levels including Biology/Human Biology or Chemistry, plus another science or science-related subject. General Studies and Critical Thinking excluded. | B100

MBiol Medical Sciences | AAA | | |

Other qualifications accepted. Please visit www.fbs.leeds.ac.uk/undergraduate for further information.

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I chose to study Medical Sciences here at Leeds as I knew it was a well-known and highly ranked University, and had a good reputation. I also knew that Leeds had a good science department and would be good place to go for what I wanted to do. I really enjoy the course as I like being able to choose which modules I study and tailor it more towards my own interests.

The city and campus are a really good aspect of Leeds. The University has one single campus situated within easy reach of the city centre. Support services such as the Employability team and Careers Centre are also really useful when finding out about the opportunities available to you after graduation.

*Luke Boothman, BSc Medical Sciences (Industrial)*

(Pictured in the Miall Undergraduate teaching lab)

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Watch our course video
Neuroscience

What is Neuroscience?

Neuroscience is the study of the brain, spinal cord and the nerves that make up the nervous system. You will learn about how the central nervous system controls all bodily activities, ranging from heart rate and sexual function to emotion, learning and memory. Ultimately, it shapes our thoughts, hopes, dreams and imagination. In fact, the brain is what makes us human.

COURSE HIGHLIGHTS

• Our degree course will take you on an amazing journey through the structure and function of neurones and the way in which they communicate within the nervous system.

• You will cover all major areas of neuroscience, from the molecular to the clinical/pathological. You will learn about the disorders of the nervous system which underlie many current public health problems such as neurodegenerative diseases (Parkinson’s disease, Alzheimer’s disease) and chronic pain.

• Our Industrial Placement Year programme has received advanced degree accreditation the Royal Society of Biology, as has the associated MBiol programme.

BSc COURSE STRUCTURE

In Year 1, you will be introduced to a range of topics that contribute towards your understanding of neuroscience. These include the Foundations of Biomedical Sciences, Biology of the Mind and an Introduction to Pharmacology. You will also be trained in a wide range of laboratory and transferable skills. You will have the opportunity to choose subjects of interest to you, including microbiology, philosophy or psychology.

It may be possible to transfer to Human Physiology, Medical Sciences or Pharmacology after Year 1 (subject to academic approval).

Year 2 covers the structure and function of the brain and spinal cord, methods by which brain cells communicate and process signals, the means by which the brain controls the organ systems of the body and the drugs used to treat disorders of the brain. In your second year, you will carry out a series of practicals involving making single neuronal recordings in snail brains, which is very positively reviewed by our external examiners as a unique opportunity to do such experiments.

The degree offers the opportunity to take an industrial placement or study abroad year at the end of Year 2 (subject to academic performance), which will help to broaden your experience, enhance your skills and improve your employment prospects.

In Year 3 there is a wide range of advanced, research-based topics. These are taught by researchers who are world experts in the subject and will share their current knowledge and understanding with you.

You will undertake an individual or group research or literature project, which provides an opportunity to work alongside professional researchers undertaking cutting-edge work in specialised laboratories, including confocal microscopy, culture facilities and electrophysiology rigs.

INTEGRATED MASTERS (MBiol)

Years 1 and 2 are the same as for the BSc and provide a foundation in the subject.

In Year 3 you study compulsory and optional modules, an individual or group research project and a research preparation module. In Year 4 you will undertake an extended research project throughout the year alongside exploration of specialised research topics and skills. See page 43 for more information.

PROJECTS

Projects provide an excellent opportunity to explore a subject further and enable you to develop essential skills such as problem-solving, communication and teamwork, all vital to success in your future career.

Recent final-year projects have included:

• Novel HDAC inhibitors a treatment for neuronal disorders. Molecular biology used in laboratory project

• Human neurophysiology (EEG) and cutaneous sensitivity testing – understanding how we perceive pain
• Manipulating neurogenesis in the postnatal spinal cord – this involves using a variety of techniques to study postnatal neurogenesis
• Functional analysis of candidate genetic risk factors for brain disorders
• Investigation of GABAergic signalling in peripheral sensory neurons.

Many of these resulted in publication in peer-reviewed journals.

Alice van der Schoot, BSc Neuroscience

"The facilities available in lab sessions are of a very high standard at Leeds, and I get access to a lot of equipment that I wouldn’t elsewhere. The sorts of things we can produce in experiments amazes me: for example, immunohistochemistry images with beautiful fluorescence labelling or the fact that we can actually record action potentials from a snail brain! Being in the dissection room is also very surreal."

Degree | A-level | GSCE | Subject requirements | UCAS code
--- | --- | --- | --- | ---
BSc Neuroscience | AAA-AAB | Typically grade B in GCSE Mathematics and grade C English. | Three A-levels including Biology/Human Biology or Chemistry, plus another science or science-related subject. General Studies and Critical Thinking excluded. | B140
MBiol Neuroscience | AAA | | | B149

Other qualifications accepted. Please visit www.fbs.leeds.ac.uk/undergraduate for further information.

CAREERS
This degree provides an ideal introduction if you wish to pursue a career in scientific research or other careers based in healthcare. It also provides an excellent education for careers in teaching and graduate training schemes and professional careers requiring a good degree (for example, accountancy).

Typical graduate destinations include medically related careers, drug discovery, scientific writing and scientific technology. Many of our graduates are successful on courses such as graduate-entry medicine and physiotherapy.
Pharmacology

What is pharmacology?

Pharmacology is the science of medicines and other drugs, and is therefore essential to all medical disciplines and the treatment of disease. You will gain a sound scientific understanding of how drugs work in the body and how they are used to treat the whole spectrum of human disease, including diabetes, cardiovascular, cancer, dementia, depression and bacterial infections. You will also learn how drugs are discovered and developed for human use, and how they can sometimes have unwanted effects.

COURSE HIGHLIGHTS

• We have received 100% student satisfaction in the National Student Survey in seven of the last nine years.

• There is an emphasis on practical skills, with laboratory and experimental design modules an integral part of the course.

• Our tutorial and small-group work system is designed to develop essential transferable skills, such as written and oral communication, problem-solving and teamworking skills, alongside pharmacological knowledge.

• Our advanced topics and research skills modules, coupled with our modern and well-equipped teaching and research laboratories, enable you to develop excellent research skills and provide you with the opportunity to contribute to new pharmacological knowledge.

• Our BSc with Industrial Placement Year programme has received advanced degree accreditation by the Royal Society of Biology, as has the associated MBiol programme.

In Year 2 you will focus on the drug treatment of various diseases affecting a broad range of bodily systems. This will include the actions of drugs used to treat cardiovascular and brain disorders.

You will further develop your pharmacological experimental skills in more advanced laboratory classes and have the opportunity to study areas such as chemotherapy, toxicology and drug discovery. The programme offers the opportunity to take an industrial or study abroad year at the end of Year 2.

In Year 3 you will select from a range of advanced topics that cover the latest research, allowing you to follow your interests. You will also undertake an individual or group research project.

INTEGRATED MASTERS (MBiol)

Years 1 and 2 are the same as for the BSc and provide a foundation in the subject. In Year 3 you take advanced practical classes and undertake a literature-based research project to prepare for the Year 4 project. In Year 4 you will undertake an extended research project throughout the year alongside exploration of specialised research topics and skills. See page 43 for more information.
CAREERS

Pharmacology graduates are well qualified for careers in pharmaceutical and other medically related industries, as well as a whole spectrum of professional careers including medicine, dentistry, finance and teaching. Other graduates go on to PhD research and postgraduate medicine.

Degree | A-level | GSCE | Subject requirements | UCAS code
--- | --- | --- | --- | ---
BSc Pharmacology | AAA-AAB | Typically grade B in GCSE Mathematics and grade C English. | Three A-levels including Biology/Human Biology or Chemistry, plus another science or science-related subject. General Studies and Critical Thinking excluded. | B210

MBiol Pharmacology | AAA | | | B219

Other qualifications accepted. Please visit www.fbs.leeds.ac.uk/undergraduate for further information.
My year in industry was full of new and exciting experiences. I did my placement year at Mayo Clinic, Florida, USA and I was very fortunate to work on different projects that could involve using mammalian cell lines to mimic Parkinson’s disease.

Teodora Trendafilove,
BSc Pharmacology (Industrial),
(Placement at Mayo Clinic, Florida as a Biomedical Sciences intern)

(Photographed outside Lecture Theatre 14 in the Roger Stevens Building)
Integrated Masters (MBiol)

Biomedical Sciences

Our MBiol programmes have been awarded interim degree accreditation by the Royal Society of Biology.

Years 1 and 2 are the same as for the corresponding BSc degree and provide a foundation in the subject.

In Year 3, you study compulsory and optional modules and a research preparation module. You also undertake laboratory work that will expose you to some of the latest research methods and technologies such as high-throughput screening technologies, state-of-the-art fluorescent microscopy and physiological recording techniques. In addition, you will complete a literature review of the area associated with your final-year project.

In Year 4 your focus will be an extended research project on an original topic, complemented by a specialised research topics and skills. You will develop as a scientist to understand how we can tackle the major problems within your specialist area and progress our understanding in the future.

On graduation, you will have a skill set and demonstrable experience that should make you attractive to many employers.

**MBiol HUMAN PHYSIOLOGY**

**MBiol MEDICAL SCIENCES**

**MBiol NEUROSCIENCE**

**MBiol PHARMACOLOGY**

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**Year 4 MBiol**

**Compulsory modules:**
- Extended Research Project
- Advanced Research Topics
## MODULES

The modules listed below give you a flavour of the areas you will cover as part of your degree course. Course changes may occur given the fast-moving nature of the field. Visit the website to find out more about optional and discovery modules. For Year 4 (MBiol) modules see page 41.

### BSc Human Physiology

**Year 1**

**Compulsory modules covering:**
- Foundations of Biomedical Sciences
- Basic Laboratory and Scientific Skills
- Biology of the Mind
- Introduction to Pharmacology
- Human Endocrinology

**Year 2**

**Compulsory modules covering:**
- Cardio respiratory Physiology and Pharmacology
- Neurobiology
- Experimental Skills
- Scientific Skills
- Exercise Physiology in Health and Disease
- Physiology of Absorption and Excretion
- Experimental Skills in Physiology
- Topics in Physiology

**Year 3**

**Compulsory modules covering:**
- Advanced Scientific Skills
- Research Project in Biomedical Sciences
- Advanced Topics in Human Physiology

### BSc Medical Sciences

**Year 1**

**Compulsory modules covering:**
- Foundations of Biomedical Sciences
- Basic Laboratory and Scientific Skills
- Biology of the Mind
- Introduction to Pharmacology
- Human Endocrinology
- Introduction to Microbiology

**Year 2**

**Compulsory modules covering:**
- Cardiorespiratory Physiology and Pharmacology
- Neurobiology
- Physiology of Absorption and Excretion
- Experimental Skills
- Scientific Skills

**Year 3**

**Compulsory modules covering:**
- Advanced Scientific Skills
- Research Project in Biomedical Sciences
- Inherited Disorders
BSc Neuroscience

Year 1

Compulsory modules covering:
- Foundations of Biomedical Sciences
- Basic Laboratory and Scientific Skills
- Biology of the Mind
- Introduction to Pharmacology
- Human Endocrinology

Year 2

Compulsory modules covering:
- Neurobiology
- Cardiorespiratory Physiology and Pharmacology
- Experimental Skills
- Scientific Skills
- Experimental Skills in Neuroscience
- Topics in Neuroscience
- Neuropharmacology
- Molecular Neuroscience
- Cognitive Neuroscience: The process underlying cognition

Year 3

Compulsory modules covering:
- Advanced Scientific Skills
- Research Project in Biomedical Sciences
- Advanced Topics in Neuroscience

BSc Pharmacology

Year 1

Compulsory modules covering:
- Foundations of Biomedical Sciences
- Basic Laboratory and Scientific Skills
- Biology of the Mind
- Introduction to Pharmacology
- Human Endocrinology

Year 2

Compulsory modules covering:
- Experimental Skills
- Scientific Skills
- Cardiorespiratory Physiology and Pharmacology
- Neurobiology
- Experimental Techniques in Pharmacology
- Topics in Pharmacology
- Principles of Drug Discovery
- Neuropharmacology

Year 3

Compulsory modules covering:
- Advanced Scientific Skills
- Research Project in Biomedical Sciences
- Advanced Topics in Pharmacology
Sports and exercise sciences are multidisciplinary in approach. They study the theoretical application of scientific principles and techniques in physiology, biomechanics, motor control and psychology, with the aim of understanding their impact on sports performance, physical activity, health and rehabilitation.

When you choose to study sport science in the Faculty of Biological Sciences, you’ll be joining one of the leading life sciences faculties in the UK and will be taught by award-winning lecturers and world-class researchers.

Our courses cover exercise physiology, biomechanics, motor control, and sport and exercise psychology.

These courses are attractive to those who want to pursue careers in clinical support (cardiac physiology and exercise referral), biomedical engineering, physiotherapy, occupational health, coaching, education and training, and providing technical expertise for major sports organisations.

YOU COULD STUDY:
- Sport and Exercise Sciences
- Sports Science and Physiology
• Ranked 3rd in the UK for Sports Science and number 1 in the Russell Group (Guardian League Table 2018).

• Excellent career prospects – 94% of our students are employed or have gone on to further study within six months of graduating.

• 96% overall student satisfaction (National Student Survey, 2016).

• Our particular approach to sport and exercise sciences focuses clearly on the core life science disciplines that are fundamental to understanding how the body and mind work in a sport or exercise context.

• All other modules in our programmes are built around supporting the study or application of these subjects, and include mathematics, anatomy, research design and statistics.

• Industrial placement and study abroad opportunities available.

• Both courses offer Integrated Masters (MSci, BSc) degrees, which combine undergraduate- and postgraduate-level study.

Number 1 in the UK for ‘world-leading’ research in the area of sport and exercise sciences (REF, 2014)
Sport and Exercise Sciences

What is sport and exercise sciences?

As a student on this course, you will learn how the body and mind handle and learn from the demands placed on them in sport and exercise. Our courses address such questions as: How do injuries occur? Is it possible to improve performance? How does the body react in an extreme environment?

This degree is the perfect opportunity to explore the biological process of the body during physical activity. As well as offering you the chance to study something you are passionate about, with the ability to tailor your degree to your interests, it acts as the perfect springboard for a graduate career in a variety of areas.

“My year in industry has set me up with the fundamental skills to analyse athlete performance in a range of sports. Also, establishing several networks internationally stands me in good stead when it comes to new career prospects/opportunities.”

Sarah Carter,
Sport and Exercise Sciences (Industrial)
(Placement at Sports and Biomedical Engineering Laboratory, Brisbane, Australia as sports engineer researcher)

(Photographed in the Biomechanics lab)
COURSE CONTENT

**Year 1** is a common course year, which will introduce you to the core concepts of sports science, including biomechanics, exercise physiology, motor control and sport and exercise psychology. This is supported by additional professional and academic skills modules, where there are opportunities to take coaching awards or short work placements.

In **Year 2** you will build on the knowledge and skills from year one, taking specialist modules in areas such as the mechanics of sport and exercise science, while further developing your practical skills in our state-of-the-art laboratories.

In **Year 3**, alongside advanced topics in sport and exercise science, you will undertake a research project in an area that interests you. Recent examples of year three research projects include ‘Acclimatisation and the endurance athlete’ and ‘Does winning at all costs help the athlete cope better with stress?’ On graduation, you will have the skills and attributes sought by graduate employers in numerous areas.

In **Year 3** of the MSci, you will take compulsory and optional modules from the BSc alongside preparing for Masters-level study in year four.

In **Year 4** you will take sport science Masters topics, but your main focus will be on an extended research project in your area of interest. Recent topics include ‘Influence of footwear on knee joint kinetics’ and ‘Biomechanical characteristics of the delivery steps in cricket fast bowling’. MSci graduates leave with the advanced-level skills and knowledge that really set them apart in the graduate job market.

CAREERS

You will develop excellent communication and interpersonal skills by undertaking additional experiences outside the academic requirements of the course, which could include taking a national coaching award.

Sport and Exercise Sciences graduates have gone on to roles in education and training, biomechanics, coaching, clinical support, physiotherapy, teaching, physiology, occupational health, and providing technical expertise for major sports organisations.

**Recent graduate destinations include:**

- Junior product manager, Golfbreaks.com
- Coach, Happy Kidos
- Sports massage therapist, The Chiropractic Centre: Bristol
- Business development manager, Mark Two Distributors
- Personal trainer, Lifestyle Fitness
- Strength and conditioning coach, Civil Service.

Watch our course video
Sports Science and Physiology

What is sports science and physiology?

Sports science and physiology offers you a fantastic insight into the various processes of the body during physical activity. Through the core disciplines of exercise physiology, biomechanics, motor control, sport and exercise psychology, you will develop strong transferable skills that will place you in an excellent position for a wide range of graduate careers.

COURSE CONTENT

Year 1 is a common course year, which will introduce you to the core concepts of sports science, including biomechanics, exercise physiology, motor control and sport and exercise psychology.

Specific modules include the Foundations of Physiology and Cardiorespiratory Physiology.

This year is a great opportunity to develop your skills around your interests and your practical and theoretical skills. This is supported by professional and academic skills modules, where there are opportunities to take coaching awards or short work placements.

In Year 2 you will continue to specialise, with modules in exercise biochemistry, environmental physiology and exercise physiology in sport, health and disease.

During the first two years, our students develop their communication and interpersonal skills by undertaking additional experiences outside academia, including coaching awards.

In Year 3, you will specialise in one of the core themes and undertake a research project on a topic of your choice. Modules available include Advanced Exercise Physiology and Exercise Prescription for Health and Disease. You will graduate with a broad base of transferable skills ideal for the graduate job market.

In Year 3 of the MSci you will study compulsory and optional modules from the BSc alongside preparing for Masters-level study in Year 4. See page 50 for more information.
In Year 4, your main focus will be on an extended research project in your area of interest. Recent examples include:

- Markers of cardiac electrical instability in athletes or aged individuals – differences and similarities
- Vascular shear in exercise: the impact of differing exercise intensities
- Does dietary nitrate supplementation enhance cycling performance?
- A comparison of eccentric and concentric exercise as a stimulus for cardiovascular training.

The experience and skills offered by this project will place you in a very strong position for a career in research, as well as a number of other graduate careers.

CAREERS

As with our Sport and Exercise Sciences degree, graduates have gone on to roles in education and training, biomechanics, coaching, clinical support, physiotherapy, teaching, physiology, occupational health, and providing technical expertise for major sports organisations.

Recent graduate destinations include:

- Netball development officer, England Netball Governing Body
- Trainee management consultant, KPMG
- Trainee regional director, US Sport Institute
- Trainee cardiac scientist, NHS
- Professional cricketer, Yorkshire County Cricket
- Snow reporter, Ski Club of Great Britain
- Diving development officer, Active Luton.

My research project was in the field of biomechanics, looking into whether minimalist shoes were an accurate representation of actual barefoot running. I collected data from six participants running on a treadmill in barefoot condition, running in a sock and in a minimalist shoe. I collected kinematic (movement data) using retroreflective markers on specific anatomical points on each participant. These were then picked up by the 13 optoelectronic cameras in the lab through a system called Qualysis. I recorded force data through a pressure measuring system called Pedar, which effectively is an insole with 99 force transducers. My research project has given me valuable lab skills and has ignited my passion for biomechanics. I am really interested in performance analysis and definitely want to continue to work in this area. My dream job would combine my passion for biomechanics and sport.

Safia Zerdazi,
Sport and Exercise Science

(Photographed in the Biomechanics lab)
The modules listed below give you a flavour of the areas you will cover as part of your degree course. Course changes may occur given the fast-moving nature of the field. Visit the website to find out more about optional and discovery modules. For Year 4 (MSci) modules see page 51.

**Year 1 BSc**

**Compulsory modules:**
- Motor Control: Foundations of Control and Learning
- Introduction to Biomechanics
- Introduction to Sport and Exercise Psychology
- Cardio-respiratory Physiology and Exercise
- Functional Anatomy for Sport Scientists
- Fundamental of Mathematics
- Tutorial and Practical Skills in Sport and Exercise Science
- Neuroscience for Exercise Science
- Foundations of Physiology

**Year 2 BSc**

**Sport and Exercise Sciences – Compulsory modules:**
- Professional and Research Skills: Working as a Sport and Exercise Scientist
- Exercise Physiology in Sport, Health and Disease
- Motor control: Learning and implications for Sport, Exercise and Rehabilitation

**Sport and Exercise Sciences – Optional modules:**
- Coaching and teaching in sports and outdoor activity
- Outdoor adventure and team building
- Human Motor Development

**Sports Science and Physiology – Compulsory modules:**
- Exercise Biochemistry
- Professional and Research Skills: Working as a Scientist
- Exercise Physiology in Sport, Health and Disease
- Environmental Exercise Physiology

**Sports Science and Physiology – Optional modules:**
- Motor Control: The Learning Environment
- Motor Control: Learning and Implications for Post, Exercise and Rehabilitation
- Social Psychology of Sport and Exercise
- Social and applied Psychology of Sport and Exercise
- Mechanics of Sport and Exercise

**Year 3 BSc**

**Sport and Exercise Sciences – Compulsory modules:**
- Inter-disciplinary Issues in Sport and Exercise Science
- Research Project

**Sport and Exercise Sciences – Optional modules:**
- Cellular Cardiology
- Neurobiological Bases of Motor Control
- Movement Analysis
- Mechanics of Sport and Performance
- Exercise and Psychological Health
- Advanced Exercise Physiology
- Exercise prescription for Health and Disease
- Sport Medicine, Health and Nutrition
- Motor and Psychological Aspects of Rehabilitation

**Sports Science and Physiology – Compulsory modules:**
- Research Project
- Inter-disciplinary Issues
- Advanced Exercise Physiology
- Exercise Prescription for Health and Disease

**Sports Science and Physiology – Optional modules:**
- Cellular Cardiology
- Neurobiological Bases of Motor Control
- Sport Medicine, Health and Nutrition
- Motor and Psychological Aspects of Rehabilitation
- Exercise and Psychological Health
- Biomechanics of Sports Techniques
Integrated Masters (MSci) Sport and Exercise Sciences

The MSci Sport and Exercise Sciences or Sports Science and Physiology offer students the excellent breadth and depth of knowledge you would expect from a BSc degree, plus an exceptional opportunity to experience the advanced, in-depth research of a Masters qualification.

In Year 1 and 2 students take the corresponding BSc degree programme, providing the foundation for advanced study in the subject. In Year 3, you study compulsory and optional modules from the BSc programme alongside preparation for your major project in the final year.

In Year 4 the main focus of the final year is the extended research project, where you will have the chance to align your project to one of the core disciplines.

Recent projects include:
- The kinetics and kinematics of painful knees in women over 40
- Influence of footwear on knee joint kinetics
- Biomechanics of delivery in fast bowling


Although you will be undertaking an individual piece of research, you will often be part of a research team that could include PhD students, postdoctoral research assistants and academic research staff.

This not only provides an opportunity to become immersed in a fascinating individual project but gives you significant insight into, and experience of, a professional research environment.

FACILITIES
You will have access to specialist facilities and laboratories equipped with the latest technology, including echocardiography, breath-by-breath metabolic analysis, tissue oxygenation, advanced three-dimensional movement tracking and analysis, dynamometry, electromyography, electrocardiography and electrophysiology.

Degree | A-level | GCSE | Subject requirements | UCAS code
--- | --- | --- | --- | ---
BSc Sport and Exercise Sciences | AAA-ABB | Typically grade B in GCSE Mathematics and grade C English. | Three A-levels including at least one science subject. | C601
MSci Sport and Exercise Sciences | AAA | | If you do not have a science subject, you must have both A-level Psychology and A-level Sports Science/Physical Education. | C609
BSc Sports Science and Physiology | AAA-ABB | | BTEC Extended Diploma: only acceptable with a science or Psychology A-level. See website for further details. | BC16
MSci Sports Science and Physiology | AAA | | General Studies and Critical Thinking excluded. | BC19

The latest key information on courses can be found at www.leeds.ac.uk/coursefinder.
Understanding how cells and organisms function at the molecular level is fascinating. Our courses will prepare you to work in a variety of settings, such as cancer research, vaccine and drug development, infectious diseases, biotechnology and crop improvement.

FLEXIBLE DEGREE CHOICES
The first year of many of our degree courses share the same set of compulsory modules, providing you with a broad foundation as a scientist. Then, in your second, third and fourth years, you will undertake specialist modules according to your chosen degree course.

A key benefit of having a common first year is that you can easily switch between some of our different degrees. The modular structure of our degrees provides you with both core elements and optional modules that give you the flexibility to tailor your course to your interests and career plans.

There are opportunities to transfer between the Biological Sciences, Microbiology and Biology programmes (including Genetics).
RESEARCH-BASED TEACHING

By choosing Leeds you will become part of a community of bioscientists who compete with the best institutions worldwide. The University of Leeds played a key role in the birth of structural biology as a scientific discipline. Now, a £17m investment in some of the best nuclear magnetic resonance and electron microscopy facilities in the world is ensuring that Leeds stays ahead of the field.

Current research areas in biochemistry and biological sciences include cell regulation and gene expression, cell signalling, membrane biology, structural molecular biology, molecular medicine, plant biochemistry and molecular biology.

A distinctive feature of the Leeds degrees is the strong emphasis on teaching advanced topics in the final year. Students choose to study topics based on their particular interests and specific degree programme. These are taught by leaders in their research fields and focus on an understanding of specialist subjects.

You will have six hours of practical teaching a week, giving you the chance to develop relevant practical skills, including accurate recording of experiments to industry-required standards and an introduction to experimental design.

Discover more about our research online:
www.fbs.leeds.ac.uk/research

CAREERS

Careers in the field of molecular and cellular biology are wide-ranging. Career prospects are excellent, with 96% of our recent graduates having secured employment or in further study within six months.

Our graduates, can be found working in the following areas: the pharmaceutical industry; medically related industries – clinical trials, hospital laboratories, public health, medical research institutes, medical science, biotechnology, forensic science, chemical industries; and the food, water, environmental and agrochemical sectors.

Typical roles include:
- Research scientist
- Bioscientist
- Transgenic technologist
- Biotechnology specialist
- Global head of research and development
- Chief scientific executive officer
- Lab steward
- Phlebotomist
- Director of computational sciences.

I considered many different courses before eventually deciding on Biochemistry. I chose Leeds because it is are part of the Russell Group and it has an excellent reputation for research in biological sciences. I felt it was important to attend a university with a high level of research because I aspired towards a career as a scientific researcher. Leeds offers ample opportunities for students to get involved in research, through internships and final-year lab projects.

Gemma Swinscoe,
MBiol Biochemistry
(Photographed in the Edward Boyle Library)
Biochemistry

What is biochemistry?

Biochemistry has already had a profound influence in the field of medicine. It was biochemists who discovered the molecular mechanisms of many human diseases, such as sickle cell anaemia and numerous errors of metabolism, and developed the enzymatic assays which are indispensable in clinical diagnosis.

Today, biochemists are actively involved in researching the basis of complex human diseases such as cancer and obesity, as well as the diseases of an ageing population such as diabetes, cardiovascular failure and neurodegeneration.

The objective is not only to develop better diagnostics and prognoses but also to discover innovative treatment strategies based on new small molecules, biologics and vaccines.

COURSE HIGHLIGHTS

• You will gain an up-to-date knowledge of biochemistry and molecular technologies.

• A Leeds biochemistry degree is highly respected by employers, particularly owing to the analytical, technical and quantitative content of the programme.

• You will develop the ability to think rationally and scientifically, to analyse and understand biochemical data, and solve problems.

• Our MBiol and Industrial Placement Year programmes have received advanced degree accreditation by the Royal Society of Biology.

BSc COURSE STRUCTURE

In Year 1 you are provided with an integrated foundation to the subject, including the key elements of biochemistry, which introduces molecular and chemical aspects of life sciences. Weekly academic small-group tutorials are central to our programmes and provide you with an opportunity to discuss the subject and develop your scientific understanding.

My favourite aspect of the course is its integrative nature, giving a broad and comprehensive background to many scientific processes and allowing you to steer the content to your own interests. We are fortunate to be taught by leading researchers, who cover both basic scientific principles and cutting-edge concepts, and the course is well structured to build on your developing knowledge. There’s a good balance between lectures, practical sessions and problem-solving or essay tutorials, to develop a variety of skills, and a strong focus on health and disease implications, with applications to modern medicine and research.

Annabel Taylor,
BSc Medical Biochemistry
Industrial placement at Medimmune as an intern
(Photographed in Lab 13 In the Garstang Building)
In **Year 2** the focus is on in-depth study of the major areas that underpin modern biochemistry, which covers biological membranes and cell signalling, molecular genetics, theory and application of modern biochemical techniques, and molecular pathologies of human diseases, protein folding and genetic engineering. You will further develop your laboratory skills and take greater responsibility for your experimental design. The degree offers the opportunity to apply for an industrial or study abroad year at the end of **Year 2**.

In **Year 3**, you will develop specialist knowledge that will enable an understanding of current research in biochemistry and molecular biology. This is accompanied by lectures based on advanced topics which enable students to study subjects most relevant to their interests. These topics range from molecular basis of innate immunity, oncogenes and tumour suppressors to directed evolution and molecular motors.

You will undertake an independent or group research project, which further develops your analytical skills, and study advanced biochemistry topics that allow you to follow your specialised interests.

**INTEGRATED MASTERS (MBiol)**

The first two years of the MBiol programme is identical to the corresponding BSc degree.

At this stage, you will have the chance to study advanced biochemistry topics and a skills module. You will undertake advanced research practical training, which develops tailored biochemistry skills and provides the opportunity to become familiar with the cutting-edge research facilities available at Leeds. **In Year 3**, MBiol students commence their preparation for the extended research project in **Year 4** by undertaking a literature review of the subject.

In **Year 4** you will undertake an extended research project in the research laboratories and specialised research topics and skills. See page 63 for more information.

### Example of advanced topics available for study in Biochemistry/Medical Biochemistry

- Adaptive immunity
- Probing the structure of life
- Antibacterial chemotherapy
- Cancer therapy/biology
- Protein folding and related diseases
- Directed evolution
- Future of antibiotics
- Gene therapy
- Genes and development
- Immune evasion
- Microbial systems biology
- Molecular motors
- Molecular oncology
- Neurodegeneration
- Protein dynamics
- Exploiting the RNA world for therapy and diagnostics
- Synthetic biology
- Viral and cell systems biology
- Visualising viruses

### Degree Requirements

<table>
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<tr>
<th>Degree</th>
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<th>GCSE</th>
<th>Subject requirements</th>
<th>UCAS code</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc Biochemistry</td>
<td>AAA-AAB</td>
<td>Typically grade B in GCSE Mathematics and grade C English.</td>
<td>Three A-levels including Chemistry and another science subject. General Studies and Critical Thinking excluded.</td>
<td>C700</td>
</tr>
<tr>
<td>BSc Medical Biochemistry</td>
<td>AAA-AAB</td>
<td></td>
<td></td>
<td>C741</td>
</tr>
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<td>AAA</td>
<td></td>
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<td>C709</td>
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<td>MBiol Medical Biochemistry</td>
<td>AAA</td>
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<td></td>
<td>C749</td>
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</table>

Other qualifications accepted. Please visit www.fbs.leeds.ac.uk/undergraduate for further information.

### CAREERS

Biochemistry graduates find employment in the pharmaceutical and fine chemicals industries, where the development of new green biocatalysts and the continuing expansion in nanotechnology, synthetic biology and tissue engineering promises excellent and exciting opportunities for many years to come.

Our graduates also offer attributes sought after in many other professional settings, such as cancer research, vaccine and drug development, tackling infectious diseases, biotechnology and crop improvement.
Biological Sciences

What is biological sciences?

Biological sciences aims to understand how living cells work – how they generate energy, build the molecules they need to survive, grow and divide, respond to changes in their environment, and interact and communicate with one another. Through an understanding of biological systems comes opportunities to tackle major challenges such as cancer, ageing, and food security.

You will study a wide range of organisms, from viruses and bacteria to humans, and understand the role of multiple disciplines such as microbiology and genetics, which are closely aligned to molecular and cellular biology.

How are bacterial and human cells similar, and in what ways do they differ? How can scientists apply our understanding of bacteria to help decrease the spread of infectious disease and harness their ability to synthesise proteins such as human hormones for medical use? How does our immune system help us fight infection yet sometimes destroy our own tissues, leading to diseases such as multiple sclerosis and type 1 diabetes? How can we ‘engineer’ new tissues to replace damaged or worn-out organs? How do tiny mutations in our DNA cause life-threatening diseases such as cystic fibrosis or cancer? And and can researchers use our understanding to propose new treatments for these diseases?

If discovering the answers to these questions excites your curiosity, then Biological Sciences is the degree for you.

COURSE HIGHLIGHTS

- You will gain a broad understanding of organisms at the cellular and molecular level.
- We offer four specialist themes: Molecular Medicine, Infection and Disease, Molecular Zoology and Plants and Agriculture.
- Our MBiol and Industrial Placement Year programmes have received advanced degree accreditation by the Royal Society of Biology.

BSc COURSE STRUCTURE

Year 1 of this programme is designed to give you a broad grounding in biosciences. This enables you to decide which theme to choose in Year 2.

Year 1 covers an introduction to cell biology, biochemistry, microbiology, molecular physiology, genetics and immunology. This provides a broad understanding of life at the molecular and cellular level. You will also have the opportunity to select from a range of optional modules to broaden your studies.

You will develop sound laboratory techniques for studying microorganisms and cellular components such as proteins and DNA through practical classes. You will develop your ability to undertake common laboratory calculations, make your own solutions, and design experiments exploiting the techniques you have learnt to solve the problems set for you.

At the end of Year 1, there are opportunities to transfer between the Biological Sciences, Microbiology and Biology programmes (including Genetics).

In Year 2, you will continue to cover core topics in molecular and cellular biology, building on your learning in Year 1. You will study genomics and genetic engineering, and further explore cell structure and function, applying this knowledge to help you understand disease processes. In addition, one of the unique features of our programmes is that you will choose one of the following four themes, this will allow you to focus your studies in an area of interest over the remaining years of your course.

- Molecular Medicine - focuses on the actions of molecules, both as therapeutic agents (drugs) and as toxic substances.
- Infection and Disease - concentrates on areas such as virology, parasitology and immunology.
- Molecular Zoology - combines studies of animal physiology and development with opportunities to learn about pests and parasites.
- Plants and Agriculture – focuses on plant physiology, sustainable food production, and the role of pests in agriculture.
You will continue your skills development through Year 2. Practical classes will take the form of projects on topics relating to your lecture material in which you will integrate and extend the skills and techniques learnt during Year 1. Tutorials with a range of specialist tutors will develop your data analysis and interpretation skills, together with other skills such as researching new topics from the scientific literature.

In Year 3 the options available to you will depend on the modules you have taken previously. You will continue to develop a broad range of skills through the subject-specific skills module, as in previous years. In addition to advanced topic modules, in which you can choose from a range of topics at the cutting-edge of research, this year includes an independent research project, which can be laboratory, literature or computer based.

INTEGRATED MASTERS (MBiol)

Years 1 and 2 are the same as for the BSc, and provide foundation knowledge and skills. In Year 3, you will undertake a practical project which aims to introduce you to increasingly sophisticated techniques and research facilities in preparation for your research project. You will also undertake a literature review of your proposed project area, with the support of your supervisor. Alongside this, you will undertake an advanced skills module and study current topics aligned with your choice of theme.

In Year 4, you will spend approximately six months working on your research project in your supervisor’s laboratory, alongside a skills module which aims to prepare you for life as a professional scientist. See page 63 for more information.

CAREERS

With the expansion of the biosciences comes the generation of new and varied career opportunities. Some of our students enter ‘traditional’ laboratory science careers, while others use their scientific knowledge in roles such as pharmaceutical sales, public health and teaching. Some use the skills acquired during their degree to enter varied careers such as financial analysis or management. 96% of our graduates were in employment or further study within six months of graduating.

Careers routes include graduate medicine, dentistry, the pharmaceutical and biotechnology industries, public health sector laboratories, university and government-funded institutes, and health, medical, policymaking and government organisations.

In recent years, our graduates have been employed in NHS trusts, Public Health England, pharmaceutical companies (for example, Merck, Syngenta, Covance) and embarked on MSc, PhD and PGCE studies at universities including Leeds, Oxford, UCL and Edinburgh.

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<tr>
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<tr>
<td>BSc Biological Sciences</td>
<td>AAA-AAB</td>
<td>Typically grade B in GCSE Mathematics and grade C English.</td>
<td>Three A-levels including Biology and another science or science-related subject. General Studies and Critical Thinking excluded.</td>
<td>C701</td>
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<tr>
<td>MBiol Biological Sciences</td>
<td>AAA</td>
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<td>C719</td>
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</table>

Other qualifications accepted. Please visit www.fbs.leeds.ac.uk/undergraduate for further information.
Biotechnology with Enterprise

What is biotechnology with enterprise?

Many of the great challenges facing mankind (such as food security, medical advances) can be tackled through the manipulation of biological systems by scientists who have the skills to ensure that their work has an impact in the world.

As well as providing you with a comprehensive knowledge and understanding of the scientific disciplines underpinning advances in biotechnology, this degree covers essential aspects of enterprise and entrepreneurship. Enterprise describes the knowledge and skills needed to turn your ideas into reality, perhaps through starting your own business, working within a commercial organisation or in your community. The skills and commercial awareness that this course offers will benefit you whatever career you aspire to.

COURSE HIGHLIGHTS

• Developed in partnership with Leeds University Business School, one of the most respected and influential business schools in the UK.
• This innovative course is designed to provide you with an understanding of the processes required to take a product from bench to marketplace.
• This is one of a small number of degrees at the University of Leeds combining subject-specific modules with a tailored programme of enterprise teaching.
• Our BSc with Industrial Placement Year programme has received advanced degree accreditation, whilst our MBiol programme has been awarded interim degree accreditation by the Royal Society of Biology.
• You will gain a comprehensive knowledge of the applications of biotechnology in the modern world, both commercially and clinically. In addition to an in-depth knowledge of cellular and molecular life sciences, this programme covers essential aspects of business, commerce and entrepreneurship.
• You will benefit from becoming part of the University student enterprise community, offering networking opportunities with entrepreneurs and support for students who aim to start their own business.

BSc COURSE STRUCTURE

Year 1 provides an introduction to several core themes related to biotechnology, including molecular and cell biology, microbiology, genetics, immunology, and provides you with a broad understanding of life at the molecular and cellular level. Alongside these modules, you will study the processes involved in enterprise planning and management. Optional modules are also available to broaden your business awareness.

You will develop sound laboratory techniques for studying microorganisms and cellular components such as proteins and DNA through practical classes. You will develop your ability to undertake common laboratory calculations, make your own solutions, and design experiments exploiting the techniques you have learnt to solve the problems set for you.

In Year 2, you will continue to study biological processes at the molecular and cellular levels, and your continued skills development will be supported through modules that integrate regular tutorials, laboratory practicals and data-handling exercises.

You will continue to develop your understanding of business practice and will undertake a module in New Business Planning in preparation for your independent enterprise project in Year 3. In addition to this project, you will also undertake a project in biotechnology. Both projects will be supported by tutors from the relevant subject area.

Alongside your project, you will study advanced topic modules, where you can choose from a range of biotechnology topics at the cutting edge of research. You will continue to develop a broad range of skills through the subject-specific skills module, as in previous years.
INTEGRATED MASTERS (MBiol)

Years 1 and 2 are the same as for the BSc and provide a foundation in both biotechnology and enterprise management.

In Year 3, you will undertake a biotechnology practical project, which aims to introduce you to increasingly sophisticated techniques and research facilities, alongside your enterprise development project. You will also undertake a literature review of your proposed Year 4 biotechnology project area, with the support of your supervisor. You will undertake an advanced skills module and study a range of current topics aligned with your scientific interests.

In Year 4, you will spend approximately six months working on your research project in your supervisor’s laboratory, alongside a skills module which aims to prepare you for life as a professional scientist and a Masters-level enterprise module. See page 63 for more information.

I knew I wanted to continue studying science after school but I also loved business studies, so when I saw that Leeds did Biotechnology with Enterprise, I knew it was the perfect mix. I get to study biology and learn how to start up a new business, and the mix of both definitely helps me to stand out to employers.

Dominique Neilson, BSc Biotechnology with Enterprise

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<tr>
<td>BSc Biological Sciences (Biotechnology with Enterprise)</td>
<td>AAA-AAB</td>
<td>Typically grade B in GCSE Mathematics and grade C English.</td>
<td>Three A-levels including Biology and another science or science-related subject. General Studies and Critical Thinking excluded.</td>
<td>C910</td>
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<td>MBiol Biological Sciences (Biotechnology with Enterprise)</td>
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Other qualifications accepted. Please visit www.fbs.leeds.ac.uk/undergraduate for further information.

CAREERS

With the expansion of the biosciences comes the generation of new and varied career opportunities. Some of our students enter ‘traditional’ laboratory science careers, while others use their scientific knowledge in roles such as pharmaceutical sales, public health and teaching. Some use the skills acquired during their degree to enter varied careers such as financial analysis, or management.

In addition to the traditional career opportunities available to bioscientists, there is increasing demand from the growing number of biotechnology companies for graduates who can offer scientific skills combined with commercial awareness stemming from an understanding of enterprise and entrepreneurship.
Microbiology

What is microbiology?

Microbiology is the study of microorganisms, including bacteria, fungi and viruses, and embraces numerous disciplines including immunology, biochemistry, genetics and molecular biology. Micro-organisms affect almost all aspects of medicine and are essential for the environmental cycles that regenerate the planet.

The courses have an emphasis on infectious disease caused by viruses, bacteria and fungi. You will study a range of topics, including emerging infections such as Ebola, bacterial resistance to antibiotics and how infectious agents hide from immune response. These courses provide extensive practical training in microbiological and molecular techniques that equip our graduates for careers in scientific research.

COURSE HIGHLIGHTS

• Each programme is designed to provide you with a broad foundation in the diverse topics that constitute modern microbiology, with a particular emphasis on infectious disease. Leeds has the expertise to teach these at the highest level.

• Our MBiol and Industrial Placement Year programmes have received advanced degree accreditation by the Royal Society of Biology.

BSc COURSE STRUCTURE

During Year 1 you will study an introduction into microbiology, genetics, immunology, biochemistry and cell biology and will learn more about tissues, organs and body processes.

You will have plenty of opportunities to develop your practical skills. From the knowledge and skills base acquired in Year 1, you proceed to more advanced, specialised topics in your chosen area of interest.

At the end of Year 1, there are opportunities to transfer between the Microbiology, Biological Sciences and Biology programmes (including Genetics).

Year 1 and Year 2 of both programmes are similar; you can defer your choice of speciality until the end of the second year.

You will study modules in different areas, including virology, bacteriology, immunology and genetic engineering. This allows you to specialise in the detailed examination of infection, from the medical perspective and in relation to the biochemistry and cell biology of microbial replication and pathogenesis.

You will have the opportunity to gain an in-depth understanding of how micro-organisms cause disease and the options available for the treatment of these conditions.

In Year 3 of Microbiology, specialist topics can vary from a study of emerging infections, an in-depth study of the hepatitis viruses to gene therapy in humans. Topics in the final year of Medical Microbiology include the development of new antibiotics, the problems of antibiotic resistance, and specialist study of fungal and viral infections.

You will also have the chance to undertake a final-year research project, allowing you to develop your research skills.

INTEGRATED MASTERS (MBiol)

You can study the degree as an MBiol. You will follow the BSc for the first two years. In Year 3 you study compulsory and optional modules, a research project, and a research preparation module which uses many of the Faculty’s research facilities.

In Year 4 you will undertake an extended research project and specialised research topics and skills. See page 63 for more information.

*MBiol is not available on our Medical Microbiology degree.
Along with the core aspects of microbiology, you can learn about a wide range of additional topics including:

- Emerging infectious diseases
- Vaccine production
- Antibiotic production
- Antibiotic resistance
- Antiviral chemotherapy
- Host-microbe interactions
- Immune responses to infection
- Imaging virus structure
- Gene therapy
- Gene cloning and molecular biology
- Immune evasion by viruses and bacteria
- Viruses and cancer
- Genomics, transcriptomics and proteomics

**Degree specifications**

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<tr>
<td>BSc Microbiology</td>
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<td>Typically grade B in GCSE Mathematics and grade C English.</td>
<td>Three A-levels including Biology or Chemistry and another science or science-related subject.</td>
<td>C500</td>
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<tr>
<td>BSc Medical Microbiology</td>
<td>AAA-ABB</td>
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<td>General Studies and Critical Thinking excluded.</td>
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<td>C509</td>
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Other qualifications accepted. Please visit www.fbs.leeds.ac.uk/undergraduate for further information.

**CAREERS**

Given the huge importance of micro-organisms to all aspects of our lives, microbiologists will always be in demand. Microbiology is an exciting, challenging and rewarding subject; it has a key role to play in the health and development of humankind.

Typical graduate destinations include employment in laboratories in academia, healthcare and industry, as well as careers in law and other professions. Many graduates go on to further study at MSc or PhD level.

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David Busse, 
Medical Microbiology (Industrial), 
(Placement at Novartis as an industrial trainee) 
(Photographed outside the Faculty of Biological Sciences in the Sustainable garden)
The highlight of my time at Leeds has definitely been my course – both the lectures and the practical modules have been endlessly fascinating to me, and the practical focus has done a wonderful job of preparing me for the world of work. I’ve thoroughly enjoyed every module I’ve taken, even with the stress of revising, and I really appreciate being able to take such a focused course. My passion has always been microbiology, and it was great not to have to waste time with a more general first year.

Amy Roe,
BSc Microbiology (Industrial), (Placement at Mayo Clinic in Jacksonville, Florida)

(Photographed in the Waterside Cafe, Roger Stevens Building)
Integrated Masters (MBiol)
Molecular and Cellular Biology

All our MBiol programmes have received advanced degree accreditation by the Royal Society of Biology, except Biotechnology with Enterprise which has been awarded interim degree accreditation. It is expected that following the graduation of the first cohort of students, this programme may be awarded full accreditation.

You will undertake an extended research project on an original, cutting-edge topic relating to your degree (Biochemistry, Biological Sciences, Biotechnology with Enterprise, or Microbiology) in the final year of the programme. The extended project will allow you to develop your research skills to a higher level, increasingly in demand by employers and setting you apart from others.

You will have access to modern research facilities that enable tissue culture, cell sorting, bioimaging, single molecule analysis, biophysical characterisation (X-ray, NMR and mass spectroscopy), pathogen cultivation and plant growth. You will work alongside experienced researchers and become part of a thriving research team and environment.

Before starting your project, you will prepare a proposal that will be assessed and developed further by a supervisory team. This will provide an opportunity for you to develop professionalism as well as receive input from research leaders in your chosen field.

Your preparation for the extended project begins in Year 3 with a series of supervised team-based mini-projects that introduce you to our facilities and the analysis of data from current research. You will review literature in the scientific area that you intend to pursue in your extended project. In Year 4 of the MBiol you will undertake an extended research project and specialised research topics and skills.

**Year 4 MBiol**

**Biochemistry, Medical Biochemistry, Biological Sciences, Microbiology – Compulsary modules:**
- Extended Research Project
- Specialised Research Topics and Skills

**Biotechnology with Enterprise - Compulsary modules:**
- Extended Research Project
- Specialised Research Topics and Skills

**Optional modules:**
- Global Perspectives on Enterprise
- Enterprise and Society
The modules listed below give you a flavour of the areas you will cover as part of your degree course. Course changes may occur given the fast-moving nature of the field. Visit the website to see more about the optional modules and discovery modules. For Year 4 (MBiol) modules see page 63.

## BSc Biological Sciences

### Year 1

**Compulsory modules covering:**
- Introductory Skills for Biological Sciences
- Introduction to Genetics
- The Basis of Life
- Molecular Physiology
- Introduction to Microbiology

### Year 2

**Compulsory modules covering:**
- Human Diseases
- Genetic Engineering
- Cell Biology of Disease
- Biological Membranes and Cell Signaling
- The Power of Bacterial Genomics
- Skills for Biological Sciences

You will choose to focus your studies in an area of interest in one of the four themes below:
- Molecular Medicine
- Infection & Disease
- Molecular Zoology
- Plants and Agriculture

### Year 3

**Compulsory modules covering:**
- Advanced Skills in the Biosciences
- Research Project

Plus you can choose from a range of themes:

**Molecular Medicine:**
You will continue to focus your studies in one of the four themes below:
- Molecular Medicine
- Infection & Disease
- Molecular Zoology
- Plants and Agriculture

All themes include an independent research project, selected from biochemistry, microbiology, genetics or biology, and an advanced skills module.

## BSc Biochemistry

### Year 1

**Compulsory modules covering:**
- Introductory Integrated Biochemistry: Molecules and Processes of Life.

Covering structure and function of proteins and nucleic acids, copying, processing and regulation of genetic information, essential metabolism and its relation to disease.
- Introductory Biochemistry: Practical Skills
- Introductory Biochemistry: Problem Solving and Data Handling

### Year 2

**Compulsory modules covering:**
- Intermediate Integrated Biochemistry:
  - Covering biological membranes and cell signalling, molecular genetics, theory and application of modern, biochemical techniques, biochemical, basis of health and disease.
- Intermediate Biochemistry: Practicals
- Intermediate Biochemistry: Skills

### Year 3

**Compulsory modules covering:**
- Advanced topics, 1, 2 and 3

**Topics include:**
- The molecular basis of innate immunity, oncogenes and tumour suppressors, world of viruses, neurodegeneration – from genes to therapy, how to create better proteins by directed evolution, molecular motors.
- Advanced Biochemistry Skills
- Research project
**BSc Biotechnology and Enterprise**

**Year 1**
- Compulsory modules covering:
  - Introductory Skills for Biotechnology
  - Introductory Microbiology
  - Enterprise in Action
  - The Molecules of Life
  - Introduction to Genetics
  - Molecular Physiology
  - Applied Biology and Agriculture

**Year 2**
- Compulsory modules covering:
  - Intermediate Skills for Biotechnology
  - New Enterprise Planning
  - Genetic Engineering
  - Entrepreneurship in Theory and Practice
  - The Power of Bacterial Genomics
  - Sustainable Food Production

**Year 3**
- Compulsory modules covering:
  - Advanced Skills in the Biosciences
  - Enterprise Development Project
  - Advanced Entrepreneurship
  - Applied Genetics

**BSc Microbiology**

**BSc Medical Microbiology**

**Year 1**
- Compulsory modules covering:
  - Introduction to Genetics
  - The Basis of Life
  - Molecular Physiology
  - Introduction to Microbiology
  - Introduction to Immunology (Microbiology students)
  - Skills for Microbiologists

**Year 2**
- Compulsory modules covering:
  - The Power of Bacterial Genomics
  - Genetic Engineering
  - Cell Biology of Disease
  - Molecular Virology
  - Medical Bacteriology
  - Medical Immunology
  - Medical Virology
  - Skills for Microbiologists

**Year 3**
- Compulsory modules covering:
  - Advanced Topics in Microbiology
  - Microbiology Research Project
  - Skills in Microbiology

**Medical Microbiology**
- Advanced topics in Medical Microbiology
- Medical Microbiology Research Project
- Skills in Medical Microbiology
Develop through sport

The University of Leeds provides the largest range of sports programmes and facilities of any UK university and, in addition to academic study, many students are active sports players.

The University is a multi-sports hub, with over 60 different sports clubs organised by students, for students, through the Leeds University Union. We are consistently in the top 20 in the British Universities and Colleges Sport (BUCS) rankings and we are a key player in several BUCS premier leagues.

Leeds also runs the Gryphons programme – a comprehensive offer of support services for sports clubs and individuals, including scholarships, elite coaching, physiotherapy and sports massage.

Over 3,000 students and staff compete on a weekly basis in organised recreational sport. This includes weekly leagues, an individual mini-leagues programme, interhalls sport and international student sport. In addition, throughout the year, several one-off tournaments are held in a wide range of sports.

In addition to providing opportunities to participate and perform, the Sport and Physical Activity Service provides a number of sports coaching awards, and physical education special skills modules are offered as elective options. The coaching programme offers over 80 awards, and trains large numbers of students, many of whom go on to deliver voluntary coaching in the local community.

SPORT AND FITNESS

Whatever your level of fitness, we provide excellent opportunities to keep healthy and get active. So, whether you want to participate for fun, at club level or at the highest national or international standards, at Leeds you’ll be inspired to achieve your personal best.

The Edge, our flagship £13.5m indoor facility, provides a variety of fitness, sport and wellbeing opportunities including:
- 250-station state-of-the-art fitness suite – the largest in UK higher education – complete with the latest Technogym equipment and Sky TV
- 25m, eight-lane swimming pool with movable floor
- sauna and steam room
- squash courts
- strength and conditioning room
- three studios offering over 140 classes per week during term-time – covering everything from yoga and Pilates to circuits and group cycle
- climbing wall.

The Edge is the latest addition to our sporting facilities, completing our existing provision at the Gryphon Sports Centre, Sports Park Weetwood and outdoor centres in the Yorkshire Dales and the Lake District, perfectly located for hiking, caving, mountain biking and climbing.

Take the virtual tour at www.leeds.ac.uk/theedge

“Keeping fit and staying healthy is an important part of the University experience. At Leeds, you will have plenty of opportunities to pursue all your sporting interests or perhaps participate for the first time. We have excellent facilities and offer a range of support, whether you want to participate for fun or at club and elite levels.”

Stewart Ross,
Director of Commercial and Campus Support Services
Sports scholarships

The Faculty of Biological Sciences has a history of supporting elite athletes with their sporting and academic ambitions. Our prestigious Sports Scholarship programme supports elite athletes as they combine academic and sporting excellence during their time at university.

Here at the University of Leeds we are committed to ensuring our elite athletes are able to compete at the highest level, whilst studying for a world-class degree.

Each year we award a number of elite sports scholarship packages to selected high-performing athletes competing in BUCS sports, who demonstrate aspirations to progress and achieve high levels of success within their chosen sport.

Our scholarship programme recognises the individuality of each athlete, and that needs differ from sport to sport. Our programme is sympathetic to this, providing a unique approach that tailors our scholarships to the needs of each individual athlete.

http://sport.leeds.ac.uk/sport/performance-sport-scholarships/

"The Sports Scholarship programme is exceptional and the strength and conditioning support is perfect for my needs as an athlete. The University is very flexible and works around my academic timetable and what is best for me.

Jodie Cunningham, BSc Medical Sciences

(Plays rugby league at England senior international level)"

"I've been representing South Africa in triathlon and it's taken me round the world. Wherever I went, I always bumped into guys from Leeds who were really positive about it, so I applied here. I wanted to get on the Development Squad – it's the University's way of helping athletes who are looking for a future in sport to reach their potential while studying here.

The University is very understanding and flexible about helping us to manage the studying, training and competing, and the facilities at the Edge are fantastic, especially for triathlon. I use the pool regularly and the gym for strengthening and conditioning.

Leeds is really friendly – I've made lifelong friends from my halls. You have to take advantage of freshers' week. Don't hold back: go out and meet people, make the most of it – you're only a student once.

Gareth Jooste, BSc Sports Science and Physiology

(Pictured outside the 25m, eight-lane swimming pool at The Edge)"
Situated close to the heart of the city, the University of Leeds is a single campus, so there is a real community feel here and you will find our accommodation, teaching facilities, students’ union and student services all within easy reach.

GLOBAL COMMUNITY
If you choose the University of Leeds, you’ll be part of our global community of students from over 140 countries. We attract world-class academics with far-reaching influence who are champions of international activity. We have links with over 400 institutions worldwide and more than 6,000 international students study with us each year. This means that you’ll graduate with a truly global perspective – something highly valued by employers.

You’ll have the opportunity to meet new people and take part in intercultural activities, introducing you to a world of new ideas and experiences.

www.leeds.ac.uk/globalcommunity

YOUR STUDENTS’ UNION
Leeds University Union is not only one of the best in the country, it’s also the most active. With more than 30,000 members, the Union is a vibrant organisation, providing a hub of activity where students can meet, make friends, get advice and get involved.

The Union building is located at the heart of campus and boasts a variety of shops where you can buy everything, from your everyday groceries, health food and University clothing to books, stationery, cards and gifts, plus there’s a variety of food outlets too.

There are over 300 student-run societies, including sports groups, departmental groups, performance groups, faith groups, political groups, volunteering groups and general interest groups, to name just a few!

Whether you want to pursue an existing interest or try something completely new, there’s something for everyone. Find out more about how you can love your time at Leeds

www.luu.org.uk

Leeds University Union is the first students’ union in the UK to be awarded an ‘Excellent’ status by the National Union of Students (NUS) as part of its Quality Students’ Unions accreditation scheme.

FOBSOC/SOCieties
Join one of our student-run clubs and societies and let us help you make the most of your time at university! We run a variety of fantastic social and educational events and guarantee that joining will enhance your experience while studying at Leeds. FoBSoc is for all students in the Faculty of Biological Sciences – and everyone from outside the Faculty as well. It’s the third largest departmental society in the students’ union, bringing everyone together – from microbiology to zoology to sport science.

Other student-run societies including Bio Soc, Sports Science Soc and Zoo Soc organise lots of events and activities throughout the year, so you can meet people from all years and courses across the Faculty.

ACCOMMODATION
We have an impressive range of catered and self-catered accommodation located on campus or close by. As an undergraduate student at Leeds you have a guaranteed single place in University accommodation for your first year.

Please note: restrictions apply relating to deadlines, residences and academic offer status.
For more information about our accommodation visit:

www.accommodation.leeds.ac.uk
Life at Leeds

Leeds is a vibrant, affordable and multicultural city renowned as a centre for arts, sports, leisure, entertainment and nightlife. It has everything you would expect from a major city and is surrounded by beautiful, accessible countryside. Our single campus is only a ten-minute walk from Leeds city centre. With over 60,000 students living within the city boundaries, there’s a real student focus, making it an exciting place to live and learn.

1. Leeds is the only English city outside London with its own repertory theatre, opera house and ballet companies. Leeds Art Gallery has one of the UK’s best collections of contemporary British art and the city is home to the Royal Armouries, the national collection of arms and armour.

2. Leeds has a well-deserved reputation for being great for shopping, as it has everything from big name designer labels to independent boutiques. A selection of shops, bars and restaurants can also be found at the £350m Trinity Leeds complex.

3. The 13,500 capacity Leeds First Direct Arena has seen world class acts such as Elton John, Drake, Little Mix, Bruno Mars, Bastille, Bruce Springsteen, Ed Sheeran perform since opening in 2013.

4. Leeds is the ideal gateway to the Yorkshire region – the Yorkshire Dales National Park is on our doorstep, and features some of the country’s most beautiful landscapes. Yorkshire is the largest county in the UK, with incredible scenery, from inspiring moorlands to stunning coastlines.

5. There are more listed buildings in Leeds than in any English city outside London. Highlights include the Victoria Quarter, Leeds Corn Exchange and Harewood House, a majestic 18th-century stately home and gardens, situated just north of Leeds.

6. Leeds is home to some great sporting teams including Leeds United Football Club based at Elland Road Stadium. Rugby fans will be spoilt for choice, with both Leeds Rhinos rugby league and Leeds Carnegie rugby union teams based at Headingley Carnegie Stadium, which is also home to Yorkshire County Cricket Club and host to international Test Match cricket.
How to apply
UCAS

EQUIVALENT QUALIFICATIONS
We welcome students with a range of qualifications, which are listed on our website.

ACCESS TO LEEDS
The University of Leeds has a policy of welcoming applicants from non-traditional academic backgrounds. If you do not meet our entry criteria, you may be eligible via the Access to Leeds scheme. www.leeds.ac.uk/a2l

FOUNDATION COURSES
If you do not have the formal qualifications for immediate entry to one of our degrees, you may be able to progress through a foundation year. The University offers a one-year BSc Studies in Science designed to prepare students without a science background at A-level for study on one of our degrees in biological sciences. We also offer an interdisciplinary Science Foundation Year for applicants who meet specific widening participation criteria. www.llc.leeds.ac.uk

INTERNATIONAL STUDENTS
We are a truly international university and we have many years’ experience welcoming overseas students to the Faculty of Biological Sciences. Leeds has a long history of providing both an inspirational academic experience and excellent student support. As one of the most popular destinations in the UK for international students, we understand your needs and have dedicated support to help make student life in Leeds enjoyable and successful. www.fbs.leeds.ac.uk/undergraduate/international

INTERNATIONAL FOUNDATION YEAR
There are a range of options if you do not meet the requirements for direct entry onto programmes. Our International Foundation Year (IFY) is intended for international students who do not yet have the formal qualifications required for entry to level 1 of our degree courses. www.leeds.ac.uk/ify

SCHOLARSHIPS
We offer a range of prestigious scholarships to reward achievement and recognise potential to both UK, EU and International students. Some scholarships are automatically awarded and focus solely on academic excellence, while others require an application and are based on household income and additional factors. www.fbs.leeds.ac.uk/undergraduate/scholarships

INTERNATIONAL QUALIFICATIONS
We have many international students and we make offers to students with the most recognised national and international qualifications on the basis of the information contained on your UCAS form.

For details of acceptable qualifications visit www.fbs.leeds.ac.uk/undergraduate/equivalent-qualifications

ENGLISH LANGUAGE REQUIREMENTS
If English is not your first language, you must have evidence of an English qualification or other proficiency in English, equivalent to GCSE grade C or above, or an equivalent recognised English language qualification such as IELTS 6.0 overall with no less than 5.5 in each element.

THE LANGUAGE CENTRE
Language Centre facilities are open to all the University’s students, whether they want to learn a foreign language, improving their English skills or keep up to date with world news. www.leeds.ac.uk/languages

All undergraduate applications should be made through the Universities and Colleges Admissions Service (UCAS). Full instructions on how to apply are available at www.ucas.com

Steps to apply:

1. All undergraduate applications should be made through the Universities and Colleges Admissions Service (UCAS).
2. Full instructions on how to apply are available at www.ucas.com.
Visit us

OPEN DAYS – BEFORE APPLICATION

We recommend that you visit your prospective place of study when choosing your UCAS shortlist. University of Leeds open days are held throughout the year. We hold talks and practical laboratory demonstrations and offer the opportunity to meet staff and students.

The main campus is open, so you can get a feel for the University. Open day dates, timetables and maps are available online.

www.leeds.ac.uk/opendays

VISIT DAYS – AFTER APPLICATION

Finalising your choice of university is an important decision. If we make you an offer, we will invite you to join us on a special visit day just for offer-holders.

This is an opportunity to look around, meet members of staff, current students and other prospective students. We strongly recommend that you attend even if you have visited Leeds before as this is an opportunity to get in-depth information in a smaller group to help you make your final choice. During your visit, current students will show you around campus and answer questions on what it is like to study at Leeds. We also interview for some of our courses.

FINANCIAL HELP

For information about scholarships and bursaries based on income and financial need, please refer to www.leeds.ac.uk/yourfinances

CONTACT US

If you require any further information before making a formal application, please contact our Undergraduate Admissions team.

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University of Leeds
Leeds LS2 9JT
Tel. 0113 343 3021

fbsadmissions@leeds.ac.uk
www.fbs.leeds.ac.uk/undergraduate

FIND US ONLINE

To find out more about the University and the Faculty of Biological Sciences visit:

www.leeds.ac.uk
www.fbs.leeds.ac.uk
www.facebook.com/biologicalsciencesleeds
www.twitter.com/ScienceLeeds
www.instagram.com/universityofleeds