

Biomedical Sciences

 BSc (Hons)

COURSE DETAILS

- A level requirements: [ABB](#)
- UCAS code: C130
- Study mode: Full-time
- Length: 3 years

KEY DATES

- Apply by: [31 January 2024](#)
- Starts: 23 September 2024

Course overview

This programme provides a broad-based education in life sciences related to medicine and medical research, and offers great flexibility of module choice so that you can tailor elements of your degree to your own particular interests.

INTRODUCTION

This degree will allow you to study from a broad range of modules from medically-relevant disciplines including Cellular and Systems Physiology, Cellular Basis of Health & Disease, and Genetics & Immunology. In addition, you can then tailor your Biomedical Sciences degree with a choice of modules from the Biochemistry, Pharmacology, Cancer biology, and Microbiology & Infection disciplines. You will also have the opportunity to specialise and carry out your own research project.

We also offer support for making career choices right from the beginning and you will have the opportunity to consider potential career pathways within and outside the field of Biomedical Sciences.

You'll learn and develop those important transferable skills in communication, team working, project management and computing with practical sessions and group work.

WHAT YOU'LL LEARN

- Develop practical and theoretical knowledge of the core biomedical sciences disciplines covering elements of both health and disease.
- Develop a range of practical laboratory and research skills commonly used in the Biomedical Sciences.
- Enhance your understanding of contemporary issues, ethical challenges, and professionalism in the sphere of the Biomedical Sciences.

- Become literate in finding, interpreting, evaluating and managing information
 - Communicate ideas effectively to a variety of audiences
 - Work independently and collaboratively
 - Develop critical thinking and problem-solving skills
 - Use lab equipment correctly and safely
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Course content

Discover what you'll learn, what you'll study, and how you'll be taught and assessed.

YEAR ONE

In this first year, you will commence your transition from learner to student. You'll start by gaining an understanding of core concepts of biology as well as the fundamental principles of immunity, infection, and therapy. You will also study how organisms develop and function, and learn about ecology and the global environment. You will develop practical skills, and you will discover how to utilise quantitative skills and study techniques. This year allows you to start to see how the Life Sciences fit together, and importantly where the Biomedical Sciences fits in this awesome jigsaw.

COMPULSORY MODULES

- Biology core concepts, principles, and fundamentals BIOS101
- Development, function, immunity, infection, and therapeutics BIOS102
- Introductory Practical Skills for Life Sciences BIOS103
- From Individuals to Ecosystem BIOS104
- Study and Communication Skills Tutorials BIOS105
- Applied Practical Research Skills for Life Sciences BIOS106

Programme details and modules listed are illustrative only and subject to change.

YEAR TWO

In your second year you'll expand your range of knowledge building those essential research skills, experimental design and analysis together with professional skills preparing you for a career within or outside the area of biomedical sciences. You will study in the disciplines of Physiology, Biochemistry, Immunology, and Genetics. In addition, you will start to tailor your degree with optional modules enabling you to follow your interest in Biochemistry, Cancer Biology, Microbiology & Infection, or Pharmacology.

COMPULSORY MODULES

- Genetics, Microbiology & Infection BIOS201
- Intermediary Practical Research Skills for Life Sciences BIOS203
- The Cellular Basis of Health & Disease BIOS209
- Chemistry for Life Sciences BIOS215
- Cellular and Systems Physiology BIOS214
- Academic & professional skills tutorials BIOS205

OPTIONAL MODULES (CHOOSE ONE)

- Biomolecular / Biochemistry / Pharmacology Practical BIOS204
- Microbiology, Infection & Disease BIOS206

OPTIONAL MODULES (CHOOSE ONE)

- Metabolism BIOS212
- Drug Discovery & Development BIOS216
- Molecular Microbiology & Therapeutics BIOS218

OPTIONAL MODULES

THE IMMUNE SYSTEM IN HEALTH AND DISEASE (LIFE221)

Credits: 15 / Semester: semester 1

The module will develop knowledge and understanding of the immune system, the molecules, cells and tissues that are involved in its function, its role in combating infection and how its dysfunction can contribute to disease.

Lectures will be supplemented with on-line resources. Problem solving workshops dedicated to case studies will be held to help students prepare for the assessments. Students will be given guided reading, and formative and summative assessment exercises held during the course will enable students to monitor and evaluate their progress and to prepare for the final assessment.

The module will be assessed by two assessments.

FROM GENES TO PROTEINS (LIFE201)

Credits: 15 / Semester: semester 1

This module aims to provide students with an understanding of the fundamental processes whereby genetic information is expressed as proteins in prokaryotic and eukaryotic cells. Lectures will be supplemented with on-line resources. Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module. The module will be assessed two assessments.

BIOLOGICAL CHEMISTRY (LIFE245)

Credits: 15 / Semester: semester 1

The Biochemistry and Pharmacology programmes, and at UoL require students to have studied chemistry to A level or equivalent standard. The Biological Chemistry module is designed to build on this background, and the chemical content of the Year 1 modules, especially LIFE101 and LIFE102 (which is designed for all students) to develop chemical understanding and analytical skills to support later modules in structural and mechanistic biochemistry, medicinal chemistry and pharmacokinetics. The module may also be taken by C130 or C100 students with the appropriate chemical background to equip them to study some of these later modules as part of their general programmes.

THE MULTICELLULAR ORGANISM: TISSUES, DEVELOPMENT, REGENERATION AND AGING (LIFE205)

Credits: 15 / Semester: semester 1

This module aims to describe the structure and function of fundamental tissues, such as epithelial and connective tissue and of specialised tissues such as muscle and the nervous system. An introduction to the mechanisms by which cells differentiate to form different tissues and regenerate following injury will be included. The processes that occur during aging will be explained with special reference to changes in key tissues and organs. The lectures will be supplemented with on-line resources, guided reading and formative assessment exercises that will enable students to evaluate their understanding of the module. The module will be assessed by both continuous assessment and by a final examination.

VIROLOGY (LIFE209)

Credits: 15 / Semester: semester 1

This module is an introduction to modern virology.

The module provides an overview of different virus families and aims to explain the fundamental properties of different viruses, their infection in different organisms, their detection and control, and positive applications of viruses.

The lectures will be supplemented with online resources. Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module.

The module will be assessed by continuous assessment.

PRACTICAL HUMAN PHYSIOLOGY (LIFE229)

Credits: 7.5 / Semester: semester 1

The aim of this practical module is to develop students' core experimental skills in human physiology, including methods to measure the cardiovascular and respiratory systems. Students will thus improve their understanding of scientific method, and develop teamworking and presentation skills. During the practical classes and plenary lectures students will be introduced to various techniques for measuring physiological variables. Then they will learn how to apply appropriate statistical tools to define the normal or expected range for physiological variables. Students will learn how to design experiments and how to assess the accuracy and precision of data, and identify sources of error. The module is continuously assessed.

MOLECULAR SCIENCE (LIFE237)

Credits: 7.5 / Semester: semester 1

This module is a 6 weeks molecular biology practical to provide experience in techniques to isolate, clone and analyse genes (analysis of DNA fragments by agarose gel electrophoresis, PCR, transformations, plasmid DNA preparations, gene cloning). The module has a range of different formative and summative assessments to include in-course problem-solving exercises, online quizzes and abstract writing, which ensure the student becomes confident to continue genetic manipulations in specialist Year 2 Semester 2 practical modules and for project work in Biochemistry, Genetics and Molecular Biology. The module will encourage confidence, teamwork and communication through active learning in lectures and practicals centred around authentic assessments.

DRUG ACTION (LIFE206)

Credits: 15 / Semester: semester 2

This module aims to enable students to develop their understanding of the cardiovascular, endocrine and central nervous systems and the mechanisms by which drugs interact with physiological processes operating within each of these systems. They will also gain an appreciation of the drug development process, including clinical trials and drug regulation. The lectures will be supplemented with on-line resources. Students will be given guided reading, and regular formative assessment exercises in class will enable students to evaluate their understanding of the module. The module will be assessed by an online test and a final examination.

MOLECULAR AND MEDICAL GENETICS (LIFE208)

Credits: 15 / Semester: semester 2

This module aims to introduce students with an interest in Genetics and Molecular Biology to the range of biological mechanisms that control structure and stability of the genetic material and their impact on health and disease.

It uses examples from both prokaryotic and eukaryotic organisms, to develop principles that explain DNA replication, repair and recombination. These principles and processes are then discussed in a clinical/medical genetics context.

The lectures will be supplemented with on-line resources. Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module.

The module will be assessed by continuous assessments.

BIOTECHNOLOGY (LIFE210)

Credits: 15 / Semester: semester 2

This module will examine the ways in which biological processes are applied for solving technological processes.

Examples of specific processes will be used including production of antibiotics, biomass, single cell protein, biopolymers, vaccines and other therapeutic agents.

The lectures will be supplemented with on-line reading resources. Students will be given guided reading, and regular formative assessment exercises will enable students to evaluate their understanding of the module.

The module will be assessed by two assessments.

PRACTICAL PHARMACOLOGY (LIFE234)

Credits: 7.5 / Semester: semester 2

This module aims to provide practical experience in many of the techniques specifically used in the study of Pharmacology. It will also provide you with the specialist skills and knowledge of techniques necessary to undertake practical work and project work in Year Three. Each practical will be introduced through a 15-20 minute presentation and will run for 3 hours. The module will be assessed through a report describing the experimental techniques and main findings of one of the key practicals, and through a final online assessment aimed at evaluating student understanding of the experimental approaches, underpinning pharmacological principles and data processing/interpretation.

ADVANCED BIOCHEMICAL TECHNIQUES (LIFE224)

Credits: 7.5 / Semester: semester 2

This module will provide practical experience in advanced biochemical techniques. Students, working in small groups (of 4, exceptionally 3) will plan and perform two experimental projects: one on enzyme stability, and the other on protein purification. This module is required for students intending to enter the Biochemistry Honours School and is continuously assessed.

ADVANCED MICROBIOLOGICAL TECHNIQUES (LIFE228)

Credits: 7.5 / Semester: semester 2

This practical module aims to provide students with an opportunity to learn and apply a range of microbiological laboratory techniques in order to develop their ability to plan and execute research projects in microbiology. The module is continuously assessed.

PRACTICAL SKILLS IN TROPICAL MEDICINE (LIFE236)

Credits: 7.5 / Semester: semester 2

This practical module will enhance knowledge and understanding of the biology and control of parasites of medical importance and their vectors. This is achieved through a series of laboratory experiments and plenary lectures. Topics will include the diagnosis and pathology of parasitic infections; interactions between the environment, humans, mosquitoes, and their parasites; techniques for the control of vectors, including susceptibility to insecticides; data handling and interpretation. The module is continuously assessed.

Programme details and modules listed are illustrative only and subject to change.

YEAR THREE

Year three will provide an unparalleled opportunity for you to learn at the cutting edge of biomedical sciences research and be taught by world-leading academics in the subjects of biochemistry, immunology, microbiology, physiology, and pharmacology. You will also have the opportunity to take a physical or virtual placement. Central to this year is the capstone research project where you will plan and execute your own research, analyse, and critically evaluate data and communicate your research findings in your chosen specialisation.

COMPULSORY MODULES

- Research Project BIOS301
- Introduction to the World of Work BIOS302
- Research Methods BIOS303
- Applied Biomedical Sciences BIOS310
- How do cells make decisions? BIOS331

OPTIONAL MODULES (CHOOSE TWO)

- Molecular, Clinical & Translational Cancer BIOS307
- Molecular Systems Biology BIOS309
- Translational Pharmacology BIOS313
- Genomics and Evolution of Microbes BIOS317

Programme details and modules listed are illustrative only and subject to change.

HOW YOU'LL LEARN

You'll learn through a balanced mix of lectures, workshops, field work, seminars and tutorials as well as hands-on, practical laboratory sessions, working individually and in small groups.

HOW YOU'RE ASSESSED

Assessed work includes essays, presentations, group work, digital communications, qualitative and experimental reports and formal examinations with results from years two and three contributing to your final degree classification.

LIVERPOOL HALLMARKS

We have a distinctive approach to education, the Liverpool Curriculum Framework, which focuses on research-connected teaching, active learning, and authentic assessment to ensure our students graduate as digitally fluent and confident global citizens.

Careers and employability

As a life sciences graduate from the University of Liverpool, you will have an excellent set of career options ahead of you. For those committed to a career as a professional scientist, higher degrees (MBiolSci, MSc, MRes, MPhil or PhD) at the University of Liverpool or elsewhere provide a flexible set of options for further study.

In the public sector, life sciences graduates are in demand in research institutes, government departments, the National Health Service, forensic science and the Environment Agency. Commercial sectors that actively recruit graduates from the life sciences include the pharmaceutical, food, biotechnology, water and agriculture industries.

There is also an increasing demand for life scientists to contribute to the public understanding of science as journalists and information/liaison officers, in view of the ethical and environmental issues that arise, for example, by developments in molecular biology and biotechnology.

A number of routes are available for graduates to enter the teaching profession one of which is taking a postgraduate qualification (PGCE). There are significant financial inducements provided to meet the current demand for science teachers. In addition to all of the opportunities for graduates in general, including careers outside of biology (such as management, accountancy and human resources), where the skills you have obtained in our degree programmes will be of considerable benefit. Our degree programmes are also popular

routes to postgraduate Medicine, Dentistry or Veterinary Science.

- Recent employers:
 - AstraZeneca
 - BBC
 - Blue Planet Aquarium
 - Chester Zoo
 - Crown Prosecution Service
 - Eli-Lilly
 - Glaxo SmithKline
 - Home Affairs, Security and International Development
 - United Utilities
 - RSPCA
 - NHS
 - Ministry of Defence
 - Unilever
 - Vodafone
 - Public Health England
 - Red X Pharma
 - Royal Society of Biology
 - The Environment Agency.

4 IN 5 LIFE SCIENCES STUDENTS FIND THEIR MAIN ACTIVITY AFTER GRADUATION MEANINGFUL.

Graduate Outcomes, 2018-19.

Fees and funding

Your tuition fees, funding your studies, and other costs to consider.

TUITION FEES

UK fees (applies to Channel Islands, Isle of Man and Republic of Ireland)	
Full-time place, per year	£9,250

International fees	
Full-time place, per year	£27,200

Fees are correct for the academic year 2024/25

Tuition fees cover the cost of your teaching and assessment, operating facilities such as libraries, IT equipment, and access to academic and personal support. [Learn more about tuition fees, funding and student finance.](#)

ADDITIONAL COSTS

We understand that budgeting for your time at university is important, and we want to make sure you understand any course-related costs that are not covered by your tuition fee. This includes the costs associated with placements or internships, and the optional field course in Uganda.

Find out more about the [additional study costs](#) that may apply to this course.

SCHOLARSHIPS AND BURSARIES

We offer a range of scholarships and bursaries to provide tuition fee discounts and help with living expenses while at university.

Check out our [Undergraduate Global Advancement Scholarship](#). This offers a tuition fee discount of up to £5,000 for eligible students starting an undergraduate degree from September 2024. There's also [the Liverpool Bursary](#) which is worth £2,000 per year for eligible students.

[Discover our full range of undergraduate scholarships and bursaries](#)

Entry requirements

The qualifications and exam results you'll need to apply for this course.

Your qualification	Requirements About our typical entry requirements
A levels	<p>ABB</p> <p>Applicants with the Extended Project Qualification (EPQ) are eligible for a reduction in grade requirements. For this course, the offer is BBB with A in the EPQ.</p> <p>You may automatically qualify for reduced entry requirements through our contextual offers scheme.</p> <p>If you don't meet the entry requirements, you may be able to complete a foundation year which would allow you to progress to this course.</p> <p>Available foundation years:</p> <ul style="list-style-type: none">• Biological Sciences (with a Foundation Year) leading to BSc (Hons)
GCSE	4/C in English and 4/C in Mathematics
Subject requirements	<p>Biology and Chemistry at A level.</p> <p>For applicants from England: Where a science has been taken at A level (Chemistry, Biology or Physics), a pass in the Science practical of each subject will be required.</p>
BTEC Level 3 National Extended Diploma	<p>D*DD in Applied Science with a selection of preferred units in Biology and Chemistry, to include Distinction in Units 1 and 5 (Principles and Applications of Science I and II).</p> <p>For previous BTEC (QCF) qualification:</p> <p>D*DD in Applied Science with a selection of preferred units in Biology and Chemistry, with at least 120 Level 3 credits at Distinction.</p>

Your qualification	Requirements About our typical entry requirements
	Please note alternative BTEC subjects are not acceptable for this programme.
BTEC Applied Science unit requirements	View the BTEC Applied Science unit requirements.
International Baccalaureate	33 including 6/5 at higher level Biology/Chemistry
Irish Leaving Certificate	H1, H2, H2, H2, H3, H3
Scottish Higher/Advanced Higher	Not accepted without Advanced Highers at grades ABB
Welsh Baccalaureate Advanced	Accepted at grade B as equivalent to a third non-science A level at grade B.
Access	45 Level 3 credits in graded units in a relevant Diploma, including 30 at Distinction and a further 15 with at least Merit. 15 Distinctions are required in each of Biology and Chemistry. GCSE Mathematics and English grade C/4 also required.
International qualifications	Many countries have a different education system to that of the UK, meaning your qualifications may not meet our entry requirements. Completing your Foundation Certificate, such as that offered by the University of Liverpool International College , means you're guaranteed a place on your chosen course.

ALTERNATIVE ENTRY REQUIREMENTS

- If your qualification isn't listed here, or you're taking a combination of qualifications, [contact us](#) for advice
- [Applications from mature students](#) are welcome.

THE ORIGINAL

REDBRICK