

Biochemistry

Essentials

What biochemistry degrees are there?

Biochemistry
Biochemistry (with a sandwich year)
Biosciences (with a Foundation Year)

See also

Biomedical sciences (p39), Medicine (p98)

What A levels/IB scores do I need?

(For other qualifications information, refer to page 125-129)

Typical A level offer range: AAB-ABB

A levels (or equivalent) must include both Biology and Chemistry

Typical IB diploma offer range: 34-36 points including Higher Levels in both Biology and Chemistry

What else do I need?

GCSE (or equivalent) Mathematics and English, grade C

Special entrance requirements apply to Biosciences (with a Foundation Year). Refer to the programme description on page 36 for details

Fees

Refer to pages 137-138 for information on fees

English language requirements

IELTS 6.5 overall and not less than 6.0 in both the Listening and Writing sections. Internet-based TOEFL with 90 overall, including at least 24 in Speaking and 25 in Writing. For alternative English language requirements, refer to page 130

Foundation year for UK and EU students

Refer to Biosciences (with a Foundation Year) on page 36

Foundation year for non-EU students

If your qualifications (including English language) do not yet meet our entry requirements for admission direct to the first year of these degree programmes, we offer an international foundation year entry route. Refer to pages 26 and 131 for details

How do I find out more?

For more information, contact:

E lifesci@sussex.ac.uk

T +44 (0)1273 678057

School of Life Sciences, University of Sussex,
Falmer, Brighton BN1 9QG, UK

www.sussex.ac.uk/biochemistry

When can I visit?

We welcome visitors to the Department of Chemistry and Biochemistry. Please contact the admissions tutor at the address above to arrange a date and time

Our Open Day dates for 2011 are 11 June and 8 October. We also run regular campus tours. Please book online at **www.sussex.ac.uk/visitors** or call 01273 876787

Why biochemistry?

Biochemistry seeks to understand and explain living systems at the molecular level. It is a scientific discipline that finds applications across the biomedical and biological sciences and underpins the biotechnology revolution. Its rapid rate of development is amazing, making it an exciting and challenging subject to study.

Biochemists try to answer questions that are fundamental to life. What are the molecules that constitute living organisms? How are they made and how is their synthesis regulated? How are they organised into cells and how do cells communicate with each other in whole organisms? How are genomes organised and what are the molecular mechanisms that direct gene expression? What is the three-dimensional structure of biological macromolecules and how do these structures enable function? What are the chemical and thermodynamic principles underlying biological reactions?

Biochemistry is central to understanding the molecular basis of genetics, development, ageing and disease in any species. This knowledge finds practical application in a wide range of areas, from genetic fingerprinting and the genetic manipulation of organisms to the use of enzymes in biological detergents and the development of personalised medicine, diagnostics and drug discovery. A degree in biochemistry is one of the best preparations for a scientific career in any of these fields.

Why biochemistry at Sussex?

- Biochemistry at Sussex scored 96 per cent in the teaching category of the 2010 National Student Survey (NSS), and biosciences at Sussex is ranked 10th in the UK in *The Guardian University Guide 2011*.
- Rated 8th in the UK for 'Pre-clinical and Human Biological Sciences' research in the 2008 Research Assessment Exercise (RAE). 85 per cent of our research was rated as recognised internationally or higher, and over half rated as internationally excellent or higher.
- You are taught by active researchers using state-of-the-art equipment, and have the opportunity to undertake an independent project in one of our research teams in your final year.
- The Biochemistry degree offers a range of options with a strong strand of chemistry, enabling you to pursue the subject in different ways according to your particular interests and preferences.
- The optional sandwich year provides you with a year's experience of working in industry, equipping you with a wide range of transferable and laboratory skills, enhancing your employability.
- In Year 1, the flexible structure of the programme makes it possible to transfer between Biochemistry and Biomedical Science.



In your final year, you join a research team and undertake a project within your chosen field of study, allowing you to experience the excitement of working at the cutting edge of biochemistry

Charlotte's perspective

'Biochemistry at Sussex is an enjoyable, exciting and academically stimulating programme. Since beginning at Sussex, I've found my interest in the subject heightened through the varied courses on offer. 'In the first and second years, courses allow you to gain an excellent background understanding of many areas of biochemistry, before specialising in your final year. 'Laboratory skills are developed through practical sessions and bolstered by teaching of research methods – a key component of each course. I've particularly enjoyed my final-year, lab-based research project, as it provides an opportunity to put into practice skills and knowledge gained in the preceding years. 'A particular strength of the School of Life Sciences is the combination of tutorials alongside lectures and practical laboratory sessions, which develops understanding in key areas of study, and enable you to get the most out of your programme.'

Charlotte Ward
BSc in Biochemistry





What sort of career could I have?

- higher degrees with a view to either entering research in biochemistry and biomedical sciences or posts in the other professions allied to medicine
- research assistant in industry, hospitals, university and government research laboratories
- scientific administration or management posts in the NHS, or the pharmaceutical and biotechnological industries
- graduate entry into medicine
- teaching
- journalism and publishing
- sales and financial services.

How will I learn?

Courses are taught by a mixture of lectures, seminars and tutorials. Assignments for tutorials include essays, data handling, computer-based studies and preparation of short talks. Developing your laboratory skills is a key objective of the first two years of the degree programme. There are weekly research seminars, where staff or visiting scientists explain recent developments in a specific field. In the final year you join one of our research teams to carry out an individual research project.

Courses are assessed by a mixture of coursework, dissertations and annual exams. If your programme includes a sandwich year, this also contributes to the overall assessment of your degree.

What will I achieve?

- the knowledge, professional expertise and laboratory skills needed to develop real insight into the phenomenal progress of biological and biomedical sciences
- first-hand experience of research
- an understanding of how to learn: especially important in fields such as this, where progress is so rapid
- skills in communication, teamwork, numeracy and information technology.

Degrees

Biochemistry

BSc (Hons), 3 years UCAS Code: C700

BSc (Hons), 4 years (with a sandwich year) UCAS Code: C706

Our core courses are designed to provide you with essential foundations in a variety of topics and give you the opportunity to engage with practical laboratory work, data analysis and presentation. This will prepare you for the more advanced options and the research project in your final year.

In Year 1, you gain a thorough grounding in cell and molecular biology, gene structure, metabolism, pharmacology, chemistry and biological chemistry, physiology, histology and data analysis and presentation skills. Practical work is an integral part of many of these courses.

In Year 2, you will study the molecular mechanisms by which cells communicate with each other within organisms and the organisation of genes and genomes. You will also study clinical chemistry and metabolism, and the molecular structure of important biomolecules. Disease-related teaching will continue with immunology, metabolic diseases, cancer and pharmacology. The power of computational biology is applied to genomes, proteomes and the three-dimensional structure of biochemically relevant molecules. Practical training and data analysis in biochemical and biophysical techniques continues throughout Year 2.

If you select the sandwich-year programme, you will spend your third year on an industrial training placement before returning to Sussex for your final year. The placement is in either an industrial laboratory (typically in a pharmaceutical or biotechnology company) or in a research institute. You are paid by the host laboratory during the placement year.

You will have a range of advanced courses to choose from in the final year. You will also join a research team and undertake a project. This will allow you to experience the excitement of working at the cutting edge of biochemistry and provide you with the opportunity to contribute to new discoveries.

Biosciences (with a Foundation Year)

BSc (Hons), 4 years UCAS Code: C701

Applicants are considered on a case-by-case basis and will present with a range of post-GCSE qualifications.

The typical A level offer is currently BCC.

The Foundation Year is taught at Chichester College.

This four-year programme is designed for those who want to study the biological sciences at a top-rated university but lack the qualifications necessary for direct entry to one of our other degree programmes. Typical entrants include those with non-science A levels, mature students, overseas applicants and students whose science A level performance fell below expectations.

The foundation year is specifically designed for the needs of students who will subsequently transfer to one of the degree programmes offered by the Department of Chemistry and Biochemistry, or the Department of Biology and Environmental Science at the University of Sussex. Introductory courses in biology and chemistry each make up 40 per cent of the study content. Practical work is an important element of these courses. The remaining 20 per cent of time is split between mathematics and study skills, including IT.

Teaching is by means of lectures, tutorials, classroom discussions and exercise classes. Small-group teaching is emphasised throughout. All courses run in parallel throughout the year and assessment is by coursework and exams.

After successful completion of the foundation year you are guaranteed a place on one of the following BSc programmes at the University of Sussex: Biochemistry (refer to above); Biology (p38); Ecology and Conservation (p59); or Neuroscience (p104). Other BSc programmes may also be available.

Core courses

Courses currently include:

Year 1

Biological Chemistry • Cell and Molecular Biology • Chemistry • Essential Skills in Biochemistry • Metabolism and Pharmacology • Physiology and Histology • Research Methods in Biochemistry

Year 2

Bioinformatics • Chemistry • Clinical Aspects of Biochemistry • Genes and Genomes • Immunology and Pharmacology • Signal Transduction • Structural Biology and Bioenergetics
In addition, you take either a course in infectious disease or a more extensive genetics course

Final year

A quarter of your study in your final year will be devoted to your research project. You will also take six advanced research-orientated courses concentrating on current developments and use cutting-edge reviews and primary research publications to discuss recent advances

Biochemistry core courses cover topics such as antimicrobial agents, cancer, cell biology, cell signalling and therapeutics, endocrinology, genomics, immunology, molecular genetics, protein structure and function, and regulation of gene expression
Depending on your interests, you may also choose final-year courses from other areas in the School of Life Sciences such as developmental biology or neuroscience

