Faculty of Science

Postgraduate courses in:
Biology & Biochemistry
Chemistry
Computer Science
Mathematical Sciences
Pharmacy & Pharmacology
Physics
Our postgraduate courses

**Taught courses**

**Biology & Biochemistry**
- MSc/MRes Biosciences
- MSc/MRes Developmental Biology
- MRes Evolutionary Biology
- MSc Evolutionary and Population Biology
- MSc Medical Biosciences
- MSc/MRes Molecular Microbiology
- MSc/MRes Molecular Plant Sciences
- MSc/MRes Protein Structure and Function
- MRes Regenerative Medicine

**Chemistry**
- MSc Chemistry for Drug Discovery
- MRes Sustainable Chemical Technologies (SCT Centre for Doctoral Training)

**Computer Science**
- MSc Computer Science
- MSc Digital Entertainment
- MSc Human Computer Interaction
- MSc Software Systems

**Pharmacy & Pharmacology**
- A fully modular and integrated suite of distance-learning postgraduate courses designed for practising pharmacy professionals is available. Visit [www.bath.ac.uk/pharmacy/masters](http://www.bath.ac.uk/pharmacy/masters)

**Research courses**

**Biology & Biochemistry**
- PhD Biology and Biochemistry
- Integrated PhD Biology and Biochemistry
- PhD Biosciences (SWBio Doctoral Training Partnership)

**Chemistry**
- PhD Chemistry
- Integrated PhD Sustainable Chemical Technologies (SCT Centre for Doctoral Training)

**Computer Science**
- PhD Computer Science
- EngD Digital Entertainment (CDE Centre for Doctoral Training)

**Mathematical Sciences**
- PhD Mathematical Sciences
- Integrated PhD Statistical Applied Mathematics (SAMBa Centre for Doctoral Training)

**Pharmacy & Pharmacology**
- PhD Pharmacy & Pharmacology
- PhD Biosciences (SWBio Doctoral Training Partnership)

**Physics**
- PhD Physics

**Doctoral Training Centres and Partnerships**
- EPSRC Centre for Digital Entertainment (CDE)
- EPSRC Centre for Doctoral Training in Catalysis
- EPSRC Centre for Doctoral Training in Condensed Matter Physics
- EPSRC Centre for Doctoral Training in New and Sustainable Photovoltaics
- EPSRC Centre for Doctoral Training in Statistical Applied Mathematics (SAMBa)
- EPSRC Centre for Doctoral Training in Sustainable Chemical Technologies
- EPSRC Centre for Doctoral Training in Water Informatics: Science and Engineering (WISE)
- EPSRC Centre for Innovation Manufacturing in Continuous Manufacturing and Crystallisation (CMAC)
- NERC GW4+ Doctoral Training Partnership in Environmental Sciences
- BBSRC South West Biosciences Doctoral Training Partnership (SWBio DTP)
- MRCGW4 BioMedDoctoral Training Partnership

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I chose to study at the University of Bath because of the fantastic range of top class research being carried out within the Department. The wide breadth of knowledge and facilities available has enabled me to think and carry out my own research in a multidisciplinary way. It is the ability to learn a wider range of skills that will hopefully make me stand me out from the crowd when I apply for postdoctoral positions in the future."

Mike Kenny, PhD Pharmacy & Pharmacology
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Welcome from the Dean of Science

Welcome to the Faculty of Science at the University of Bath. We are delighted to offer a wide range of taught and research-based postgraduate courses across six departments, from Masters to PhD and EngD courses. We have a diverse intake of postgraduate students representing all branches of science within the Faculty, and pride ourselves on our excellence in research undertaken by academic staff at the forefront of their field.

We know that deciding on the right postgraduate path can be challenging, but our Graduate School is here to help you; from providing information about our courses and the application process, to help and advice about living in Bath. Being a postgraduate student at Bath can be enormously rewarding, combining learning in a world class academic environment with living in a beautiful World Heritage city.

We hope you choose to study with us and look forward to welcoming you to the Faculty.

Professor Nicholas Brook
Dean of Science
The Faculty of Science is the largest faculty in the University with over 3,500 undergraduate students, 650 postgraduate students and more than 300 academic and research staff. We offer a diverse range of graduate courses that span the life sciences and physical sciences, including mathematical and computer sciences. There are courses available across all six departments and through Centres for Doctoral Training and Doctoral Training Partnerships, leading to awards of:

- Master of Science (MSc)
- Master of Research (MRes)
- Doctor of Philosophy (PhD)
- Engineering Doctorate (EngD).

Research excellence

The Faculty of Science prides itself on its excellence in research in the mathematical, physical and biological spheres, from fundamental studies to cutting edge applications in industry, medicine and society. Our postgraduate students benefit from being immersed in this research culture, with opportunities for interdisciplinary projects.

We have excellent facilities for research and are continually investing in its infrastructure. Our research is supported by a wide variety of funding agencies, including the UK Research Councils, the European Union, Industry and Charities. Our total research portfolio is currently in excess of £64 million.

Find out more about the research carried out in our departments on pages 8, 13, 17, 23, 25 and 27.

Faculty Institutes and Research Centres

Faculty of Science Institutes and Centres enhance the interdisciplinary nature of our research. Departments from across the University work together and with external researchers and clinicians to carry out specialist research across many areas of science. Research Centres and Institutes that our postgraduate students work with include:

- Bath Institute for Mathematical Innovation (BIMI)
- Centre for the Analysis of Motion, Entertainment Research & Applications (CAMERA)
- Centre for Mathematical Biology (CMB)
- Centre for Networks and Collective Behaviour (CNCB)
- Centre for Nonlinear Mechanics (CNM)
- Centre for Photonics and Photonic Materials (CPPM)
- Centre for Regenerative Medicine (CRM)
- Centre for Space, Atmospheric and Oceanic Sciences (CSAOS)
- Centre for Sustainable Chemical Technologies (CSCT)
- Probability Laboratory at Bath (Prob-L@B)
- The Milner Centre for Evolution – due to open December 2017.

To find out more about our Research Centres and our latest research visit [www.bath.ac.uk/science/research](http://www.bath.ac.uk/science/research)

At the University of Bath we take the development of our postgraduates very seriously. Developing your skills is key to becoming an effective scientist and to making a successful transition to your future career.”

Professor Jonathan Knight (Pro-Vice-Chancellor Research)
About the Graduate School

As Associate Dean for Graduate Studies I’d like to welcome you to the Faculty of Science Graduate School.

My role is to ensure that all of our postgraduate students receive high calibre training that maximises their opportunities for a successful career. This is orchestrated through the Graduate School, where we aim to enhance the postgraduate experience through our strong interdisciplinary community of students and academics.

In addition to administrative support, we provide added value to your academic experience through various interdisciplinary events and occasional seminars featuring high profile scientists as keynote speakers.

By pursuing postgraduate studies within the Faculty of Science you will be joining a strong, friendly and supportive family that will nurture your scientific talents and help you grow into a budding scientist.”

Sue Wonnacott
Professor of Neuroscience
Associate Dean for Graduate Studies,
Faculty of Science

The Graduate School is the centre of postgraduate activity in the Faculty of Science. We provide informed and tailored support and guidance to all prospective and current postgraduate students, from the moment of initial enquiry and application right through to graduation and beyond. Whether you’re doing a one-year master’s or a three or four-year PhD, the team is here to answer any questions you may have.

We also encourage and support interdisciplinary communications within the Faculty, through regular academic and social activities, including:

- an annual Research Afternoon, which showcases research from postgraduate students in all six departments
- Three Minute Thesis presentations
- Career Pathways Talks from PhD alumni, who describe their route to their current employment following their postgraduate studies at Bath.

The Graduate School is led by Professor Sue Wonnacott, Associate Dean for Graduate Studies, and Simon Gane, Graduate School Manager. We are based in Wessex House 3.33 and can be contacted Monday to Friday, 9am – 5pm.

Email: fsci-pgadmissions@bath.ac.uk
Telephone: +44 (0)1225 38 3410
Website: www.bath.ac.uk/science/graduate-school
Taught courses

Master of Science (MSc)
Our MSc courses are designed for students who wish to specialise further in a particular field or wish to change direction from their first degree (in a related area). The courses aim to provide professional-level training with strong theoretical, research and transferrable skills through a mix of taught components, research project and dissertation.

If you already have a strong background that includes extensive and relevant research experience and would like to develop your research skills further you might consider an MRes course.

Master of Research (MRes)
Our MRes courses are designed for graduates who are contemplating a research career and who may go on to study a PhD or to a research position in industry. An MRes is similar to an MSc degree except it involves a greater degree of research skills training and practice in the taught components. By completing an MRes degree, you will be well qualified to undertake a substantial piece of original research that results in a thesis to the same standard as a traditional PhD.

Research courses

Doctor of Philosophy (PhD) – traditional route
Studying for a PhD involves conducting an original piece of research. This typically includes developing a research idea, gaining critical knowledge of the broader research area, carrying out a substantial novel research project, evaluating the findings and communicating the results to the wider science community (through publications and/or conference presentations). The PhD culminates in submission of a thesis that is examined externally with a viva voce examination. PhD courses normally require submission of the thesis within four-years (full-time) or six-years (part-time).

A PhD is an internationally recognised level of attainment that opens up high-level career opportunities in academic and industrial sectors. Through the process of gaining a PhD you will develop into an independent researcher, equipped to undertake a wide range of career opportunities that extend far beyond the laboratory or research workspace. In recognition of this, PhD students are also given training in a wide range of generic skills and are encouraged to think more broadly about the ways in which they may use their talents when they graduate. These activities are supported through the Departments, Graduate School and Researcher Development Unit of the University.

Doctor of Philosophy (PhD) – integrated route
Our various integrated PhD courses are designed to give you an insight into a range of research activities, techniques and skills, as well as to widen your knowledge of the subject itself and the context within which the research will take place. Many of our courses are linked to Research Council funding via Centres for Doctoral Training (CDTs) or Doctoral Training Partnerships (DTPs), and some involve interactions with other universities or partner organisations.

Although the exact course of study varies considerably – see pages 28-31 – these courses start with a structured first year containing some taught elements (this may be delivered as an MSc or MRes course). Full-time PhD research starts in year two. Students studying an integrated PhD are still required to undertake a substantial piece of original research that results in a thesis to the same standard as a traditional PhD.

Engineering Doctorate (EngD)
Our EngD course is a four-year postgraduate award intended for the UK’s leading doctoral researchers who want a high-flying career in industry. It is a radical alternative to the traditional PhD, being better suited to the needs of industry, and providing a more vocationally oriented Engineering Doctorate. It is an internationally recognised level of attainment that opens up high level career opportunities in academic and industrial sectors.

Master of Philosophy (MPhil)
If you wish to undertake a shorter research project, there are MPhil courses available in all disciplines. Research is undertaken for up to two years (full-time) or three years (part-time), with submission of a thesis within three years (full-time) or four years (part-time).
Department of Biology & Biochemistry

**Taught courses**
- MSc/MRes Biosciences
- MSc/MRes Developmental Biology
- MRes Evolutionary Biology
- MSc Evolutionary and Population Biology
- MSc Medical Biosciences
- MSc/MRes Molecular Microbiology
- MSc/MRes Molecular Plant Sciences
- MSc/MRes Protein Structure and Function
- MRes Regenerative Medicine

**Research courses**
See page 28
About the Department

The Department of Biology & Biochemistry has a thriving community of over 50 academic staff and around 120 postgraduate students. It is an internationally recognised centre of excellence in both research and teaching, providing students with a vibrant and supportive interdisciplinary environment in which to study.

There are a wide range of taught postgraduate courses leading to the award of an MSc or MRes degree in a number of specialist areas: regenerative medicine, medical sciences, plant sciences, evolution, microbiology, developmental biology, as well as the broader biosciences.

Why study Biology & Biochemistry at Bath?

• One of the leading research intensive biosciences departments in the UK with an excellent international reputation – Nearly one third (31%) of outputs were rated as world-leading and an additional 52% as internationally excellent in the most recent Research Excellence Framework (REF 2014)

• Some of the best academic staff in the world – recognised through their significant research grants and contracts, plus many international awards and accolades e.g. Fellows of the Royal Society and Academy of Medical Sciences

• A scientifically stimulating environment with first class research facilities and regular seminar series featuring internationally renowned speakers

• Strong links with academia and industry in the UK, United States and Australia.

Key facilities

• X-ray crystallography & 600MHz NMR facility
• Robotics platform for protein crystallization
• Phosphorimaging service
• Microscopy and Analysis Suite includes electron and atomic force microscopes and a Bioimaging Suite for confocal, FACS and calcium imaging
• Transgenic mouse, Xenopus and Drosophila facilities
• Xenopus and zebrafish aquaria
• GM glasshouse
• Controlled environment rooms for GM plants and insects
• FACS and advanced microscopy centre
• Stopped-flow kinetics
• CD spectroscopy
• Dedicated molecular biology server
• Micro-array reader
• Tissue culture for plant and mammalian cells.

For more information on the Department’s facilities visit www.bath.ac.uk/bio-sci/facilities

Career opportunities

Many graduates have gone on to employment or further research at institutions in the US, Europe, Australia, Asia and Africa. Recent employers have included: Morvus-Technology Ltd, Janssen-Cilag, Royal United Hospital (Bath), Ministry of Defence, State Intellectual Property Office (Beijing), Wellcome Trust Centre for Human Genetics, Oxford University, AbCam, Salisbury Foundation Trust Hospital, BBSRC and Lonza.

In the Department of Biology and Biochemistry, there is a strong feeling of amity and togetherness, where MSc, MRes and PhD students regularly connect with both teaching and research fellows. This has given me and other students the opportunity to not only build hard skills in research, but develop the soft skills of networking and collaboration that are much-coveted by future employers and academia.”

Ali Hussein, PhD Biochemistry
Research

The Department of Biology & Biochemistry is a leading UK research-intensive department, renowned for its breadth of world-leading and internationally excellent research on animals, plants and microorganisms. The outstanding quality of research is reflected in the level of external funding from the UK Research Councils, medical charities, European Union and Industry as well as publications in top international journals such as Nature, Science, PNAS and PLoS Biology. The Department has a current research funding portfolio of £14 million and publishes around 125 papers in high impact international journals each year.

There are four main research themes:

- Cell and developmental biology
- Evolution and biodiversity
- Infection and immunity
- Medical and industrial biotechnology.

Visit www.bath.ac.uk/bio-sci/research to find out more.

Research Centres

The Centres for Mathematical Biology, Networks and Collective Behaviour and Regenerative Medicine enhance the interdisciplinary nature of the Department’s research.

The new Milner Centre for Evolution is also expected to open in December 2017. The Centre is the first of its kind in the UK to focus on evolutionary research, and concentrates on three related strands: fundamental research into how life evolved, applied research into the evolution of microbes and communication of evolution research to the public.

See page 3 for a full list of Research Centres.

“Studying at Bath I have learnt how to view science from different angles, which has improved my overall scientific judgement. The assessment methods used throughout the degree have enhanced my communication, presentation and writing skills, and the course structure is well organised and in line with current research.”

Ruth Ilesanmi, MSc Molecular Plant Sciences
Biology & Biochemistry

MSc/MRes Biosciences
The MSc and MRes courses concentrate on understanding the molecular principles underlying the biology of organisms, ranging from bacteria and viruses to plants and humans. The focus is particularly on the research expertise in the department, in themes including cell and developmental biology, medical and industrial biotechnology, infection and immunity, as well as evolutionary biology and biodiversity.

MSc/MRes Developmental Biology
The MSc course focuses on the science of the processes governing the growth and development of organisms. The MRes course focuses on the fundamentals of developmental biology in a range of vertebrates. Both include studies of the genes and molecules that control cell growth, differentiation and morphogenesis that give rise to tissues, organs and individuals. The department has outstanding facilities for experimental work using a range of model vertebrate organisms.

MRes Evolutionary Biology
Evolutionary biology is the branch of biology dealing with the origin and descent of species, their genes and genomes. This MRes course allows the student to study practical evolutionary problems with model organisms, such as the fruit fly, as well as theoretical explorations of evolution using modelling and bioinformatics.

MSc Evolutionary and Population Biology
This course covers the origins and appearance of organisms and their genes as well as their interactions within the environment. It includes not only theoretical and experimental studies of evolutionary biology within the laboratory studying genes, genomes and phylogeny, but also field work and applications to real problems, biodiversity and conservation science.

Key information
Duration
Full-time 12 months.

Typical entry requirements
UK first degree or 2:1 (or international equivalent) in a relevant subject.

Language requirements
IELTS 6.5 (at least 6.0 in each of the four components).

Application deadlines
June for international and August for home/EU.

Other qualifications may be accepted.

Information on funding
See page 34.

Details are subject to change; for up-to-date information please contact the Graduate School – see page 4 for contact details.
MSc Medical Biosciences
The MSc Medical Biosciences course focuses on the study of the molecular and genetic basis of human health and disease, using biotechnological methods to advance our current research. The wealth of genomic and proteomic data from the Human Genome Project has broadened our understanding of the biochemical and genetic basis of several diseases. In particular, this course will cover the rapid developments in the field of cancer and metastasis, neurodegenerative conditions, microbial pathogenesis and immune evasion science.

MSc/MRes Molecular Microbiology
The MSc and MRes courses concentrate on understanding the molecular principles underlying the biology of microorganisms such as bacteria, viruses, fungi and yeasts. In particular we study gene expression and regulation, gene transfer, genome structure, epidemiology, cell communication, and pathogenicity and virulence factors.

MSc/MRes Molecular Plant Sciences
Molecular Plant Scientists attempt to understand the biology of plants at the molecular level, which is the focus of the MSc course. The MRes course provides opportunities to study molecular problems from epigenetics through to food crops. We study, in particular, mechanisms of microbial pathogenicity and host plant defence in temperate and tropical species, cell and molecular biology of pollen-stigma recognition and signalling in flowering plants, plant hormone and G protein signalling pathways, genomics and gene networks, and molecular biology of stress responses in the important tropical crop cassava.

MSc/MRes Protein Structure and Function
This course focuses on the integration of structural biology and bioinformatics approaches in order to understand the activity of proteins, including enzymes, antibodies and receptors, at a molecular level. This understanding provides a platform for techniques such as structure-based drug design, biocatalysis and protein engineering, which are the basis for many recent advances in biotechnology.

MRes Regenerative Medicine
The MRes Regenerative Medicine course focuses in particular on modern research in developmental biology, stem cell biology and tissue engineering with its potential applications to medicine and is a collaborative course within the Centre for Regenerative Medicine

www.bath.ac.uk/crm

Course units are subject to change. See back cover for details.
MSc or MRes in Biology & Biochemistry?
The diagram below can help you decide whether a MSc or MRes course would suit you best in Biology & Biochemistry.

Course structure
All of the Biology & Biochemistry MSc and MRes courses follow a similar structure; semesters one and two involve a series of core units to give a broad overview of the subject, alongside optional units to enable students to specialise in a specific area. MSc students then undertake a research project in the summer, whilst MRes students undertake two projects throughout the year.

Students are able to customise the course according to their needs and future career ambitions in a diverse range of specialist areas. This is done under the guidance of the Director of Studies who advises on suitable taught units and laboratory projects.
Department of Chemistry

Taught courses
MSc Chemistry for Drug Discovery
MRes Sustainable Chemical Technologies

Research courses
See page 28
**About the Department**

The Department of Chemistry is a highly successful department, carrying out internationally recognised research in many areas of chemical sciences. Two buildings provide state-of-the-art facilities to a growing community of over 150 postgraduate students.

There are currently two taught postgraduate course – MSc Chemistry for Drug Discovery and MRes Sustainable Chemical Technologies.

**Why study Chemistry at Bath?**

- Research excellence – 98% of research was rated as world-leading or internationally excellent in the most recent Research Excellence Framework (REF 2014)
- World-class, cutting-edge facilities and purpose-built laboratories
- Publications in top journals, industrial partners and substantial grant income has resulted in a strong demand for Bath postgraduates and postdoctoral workers.

**Key facilities**

- Chemical Characterisation and Analysis Facility (CCAF)
- Microscopy and Analysis Suite (MAS)
- X-ray powder diffraction
- Single Crystal X-ray diffraction
- Mass spectrometry
- NMR (250/300/400/500 MHZ multinuclear facility).

For more information on the Department’s facilities visit www.bath.ac.uk/chemistry/facilities

**Career opportunities**

Many graduates have gone on to postdoctoral research at institutions in the UK, USA, the Netherlands, France Luxembourg, Norway, Brunei and New Zealand. Recent employers have included: NIST Center for Neutron Research, Tocris, EPSRC and The Royal Society of Chemistry.

**Research**

Research in the Department of Chemistry spans all sub-disciplines, from theoretical physical chemistry to biological chemistry and antibody engineering. It focuses on combining scientific excellence with a strongly collaborative and applied outlook, and has been widely recognised for its national and international impact – rated fourth amongst all UK Chemistry Departments for research impact (REF 2014). This impact has derived from work with major multi-national chemical industries, spin out companies, clinicians and a range of other industrial and commercial partners.

There are four main research areas:

- Organic
- Inorganic
- Physical
- Computational.

Visit www.bath.ac.uk/chemistry/research to find out more.

**Research Centres**

The Centre for Sustainable Chemical Technologies (CSCT) provides a multi-disciplinary environment in which researchers from the Department can develop new molecules, materials and processes for sustainability. See page 3 for a full list of Research Centres.

*Having spent almost one year at the University of Bath, the high quality of teaching as well as the high standard and achievements of the Chemistry Department have impressed me very much. It definitely is a good choice for students who have an interest in Chemistry and research.*

Yu Jin, MSc Chemistry for Drug Discovery
## Taught courses

### Key information

**Duration**
Full-time 12 months.

**Typical entry requirements**
UK 2.1 or higher first degree (or equivalent) in Chemistry, or a chemistry related subject.

**MSc Chemistry for Drug Discovery**
Prior study of the drug discovery process or specialism in medicinal chemistry is not required.

**Both courses**
Students may also enter the course of study with a taught Masters degree in an appropriate subject. The minimum non-graduate qualifications acceptable are:
- Membership of recognised professional institutions of at least graduate status or a relevant professional qualification acceptable to the Board of Studies.

**Language requirements**
IELTS 6.5 (with not less than 6.0 in each of the four components).

**References**
Two references are required.

**Application deadlines**
August for home/EU and June for international. Other qualifications may be accepted.

**Information on funding**
See page 34.

Details are subject to change; for up to date information please contact the Graduate School – see page 4 for contact details.

MSc Chemistry for Drug Discovery
The aim of the course is to provide you with experience and training in the chemical aspects of the drug discovery process through a combination of lecture-based units, research training and a research project.

The course is ideal for someone considering a career in the pharmaceutical industry, or as a stepping stone to a PhD in a related area. Including both core and optional units, topics studied include chemistry of the cell, drug properties and the synthesis of medicinal compounds. The research training allows you to gain experience in practical chemistry and in manipulating spectroscopic data. Research projects are possible in a wide range of areas including organic synthesis, biomaterials, development of sensors, and computational simulations.

### Course structure

<table>
<thead>
<tr>
<th>SEMESTER 1</th>
<th>SEMESTER 2</th>
<th>SUMMER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core taught units (18 credits)</td>
<td>Core taught units (27 credits)</td>
<td>Research project (30 credits)</td>
</tr>
<tr>
<td>Postgraduate training module</td>
<td>Future of drug discovery</td>
<td></td>
</tr>
<tr>
<td>Advanced group work in practical chemistry</td>
<td>The chemistry of physiology &amp; drug properties</td>
<td></td>
</tr>
<tr>
<td>Chemistry of the cell</td>
<td>Major therapeutic areas</td>
<td></td>
</tr>
<tr>
<td>Preparation for research project</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Optional taught units (15 credits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select 2 to 3 units</td>
</tr>
<tr>
<td>Select 1 to 3 units</td>
</tr>
</tbody>
</table>

A total of 90 credits are awarded for the year.

Optional units may include:
- Techniques in drug discovery
- Topics in organic chemistry II
- Blockbuster drugs
- Physical organic chemistry
- Synthesis of medicinal compounds
- Chemistry beyond the molecule
- Research topics in natural products.

Course units are subject to change. See back cover for details.
**MRes Sustainable Chemical Technologies**

This course, which normally makes up the first year of the Integrated PhD in Sustainable Chemical Technologies, is run through the Centre for Sustainable Chemical Technologies (CSCT) – see page 30. The Centre brings together academic expertise from the University of Bath with international industrial, academic and stakeholder partners to carry out research, training and outreach in sustainable chemical technologies.

### Course structure

<table>
<thead>
<tr>
<th>SEMESTER 1</th>
<th>SEMESTER 2</th>
<th>SUMMER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core taught units (12 credits)</strong></td>
<td><strong>Core taught unit (6 credits)</strong></td>
<td><strong>Core taught unit (6 credits)</strong></td>
</tr>
<tr>
<td>Clean technology: Design of sustainable chemical processes</td>
<td>Introduction to environmental management</td>
<td>Public engagement 1</td>
</tr>
<tr>
<td>Sustainable Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optional unit (6 credits)</strong></td>
<td><strong>Optional units (12 credits)</strong></td>
<td></td>
</tr>
<tr>
<td>Select 1 unit</td>
<td>Select 2 units</td>
<td></td>
</tr>
</tbody>
</table>

A total of 90 credits are awarded for the year.

Optional units may include:
- Fundamentals of biotechnology for non-biologists
- Principles of chemical engineering for non-engineers
- Fundamentals of organic chemistry for non-chemists
- Green chemistry & processes metrics
- Industrial catalytic processes
- Design and assembly of continuous flow set-ups
- General chemistry
- Catalysis & sustainability
- Materials chemistry for sustainable energy
- Water cycle & human health
- Commercialisation of new technology.

Course units are subject to change. See back cover for details.
Department of Computer Science

**Taught courses**
- MSc Computer Science
- MSc Digital Entertainment (placement route also available)
- MSc Human Computer Interaction (placement route also available)
- MSc Software Systems (placement route also available)

**Research courses**
See page 28
About the Department

The Department of Computer Science is research-led with strong postgraduate teaching and interdisciplinary research. It is a growing community of around 120 postgraduate students, producing cutting-edge computer science research.

The four MSc courses provide professional level training across the areas of computer science and are designed to give you a wide range of knowledge to build a career in the computing industry. Three of the courses – Digital Entertainment, Human Computer Interaction and Software Systems – also give you the opportunity to undertake a 12-month professional placement with a partner organisation.

Why study Computer Science at Bath?

- A research focussed department with an outstanding research portfolio – over 70% of research outputs were graded as internationally excellent in the most recent Research Excellence Framework (REF 2014)
- A fully supported professional placement course option available with three of the MSc courses
- A majority of Computer Science Masters graduates have moved directly into computer science careers in software development or consultancy
- Strong links with industry and collaborations with research centres of excellence both nationally and internationally.

Facilities

MSc students occupy a dedicated, purpose-built computing laboratory with an independent network that can be detached from the University’s network. This allows for experimentation with operating systems and networking as well as ordinary programming.

Career opportunities

Computer Science graduates are highly sought after and employment opportunities vary widely from computing and communications companies to software houses, government departments, research laboratories and the media industry. Recent employers have included: Web Usability Partnership, Imagination Technologies, Electronic Arts, Nomura, Goldman Sachs, OC Robotics, Nokia, PayPal and PriceWaterhouseCooper.

Research

Research in the Department of Computer Science is interdisciplinary and combines practical application with a strong theoretical understanding. It is concerned with systems-wide issues in computer science ranging from mathematical foundations through visual and cognitive processes to media technology, human-centred design and collaborative systems. Researchers from the Department collaborate widely with other disciplines including Engineering, Mathematics and Psychology.

There are four main research themes:

- Human-computer interaction
- Mathematical foundations
- Visual computing
- Intelligent systems.

Visit [www.bath.ac.uk/comp-sci/research](http://www.bath.ac.uk/comp-sci/research) to find out more.

Research Centres

The Centres for Digital Entertainment and Networks and Collective Behaviour enhance the inter-disciplinary nature of the research.

A new £5 million Centre for the Analysis of Motion, Entertainment Research & Applications (CAMERA) focuses on three areas of research – entertainment, enhancing athlete performance and helping develop assistive technologies.

See page 3 for a full list of Research Centres.
Taught courses

Key information

Duration
Full-time 12 months.
Full-time 24 months placement route – see below.

Typical entry requirements
UK first degree or 2.1 (or international equivalent) in a relevant subject.

MSc Computer Science
This generalist course is aimed at graduates with a first degree or 2.1 (or international equivalent) in a subject other than Computer Science. Maths at A-level or a mathematics unit at undergraduate level is required.

Computer Science graduates who achieved a 2.2 will also be considered. Maths is desirable for these applicants.

MSc Digital Entertainment
This course is an advanced master’s – a Computer Science or related first degree with a strong mathematical background is essential.

MSc Human Computer Interaction
This course is an advanced master’s – a Computer Science, psychology with programming experience or related first degree or relevant industrial experience is essential.

MSc Software Systems
This course is an advanced master’s – a Computer Science or related first degree or relevant industrial experience is also required.

Language requirements
IELTS 6.5 (at least 6.0 in each of the four components).

Application deadlines
August for home/EU and June for international.

Other qualifications may be accepted.

Information on funding
See page 34.

Details are subject to change; for up to date information please contact the Graduate School – see page 4 for contact details.

24-month placement route explained
Three of the Computer Science MSc courses give you the option of either a 12-month intensive or 24-month placement route. All courses are made up of nine months of taught units followed by a dissertation component. The placement route is designed to give you valuable work experience in addition to the academic experience.

On successful completion of the taught units, instead of undertaking an intensive three month period of study you will go on to 12-months of work outside the University (subject to the availability of a suitable company). You will also be required to attend an intensive placement preparation course during freshers’ week.

Intensive route (12 months) course structure

<table>
<thead>
<tr>
<th>SEMESTER 1</th>
<th>SEMESTER 2</th>
<th>SUMMER</th>
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</thead>
<tbody>
<tr>
<td>Sept - Jan</td>
<td>Feb - May</td>
<td>Jun - Aug</td>
</tr>
<tr>
<td>9 months</td>
<td>3 months</td>
<td>3 months</td>
</tr>
<tr>
<td>Taught units</td>
<td>Taught units</td>
<td>Dissertation</td>
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</table>

Intensive route (24 months) course structure

<table>
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<tr>
<th>SEMESTER 1</th>
<th>SEMESTER 2</th>
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<tr>
<td>9 months</td>
<td>3 months</td>
<td>3 months</td>
</tr>
<tr>
<td>Taught units</td>
<td>Taught units</td>
<td>Placement</td>
</tr>
<tr>
<td>Year 1</td>
<td>Year 2</td>
<td></td>
</tr>
<tr>
<td>Placement</td>
<td>Dissertation</td>
<td></td>
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</tbody>
</table>
**MSc Computer Science**

The MSc in Computer Science is aimed at graduates from a different discipline who are interested in a career in computer science. It will provide a sound foundation in practical and theoretical computation, equipping you with transferable skills, suitable for careers in a wide range of industries.

The course offers a broad overview of Computer Science in semester one through a series of core units before leading on to advanced and emerging areas of computer science, with opportunities to specialise in a number of different research areas. The final semester dissertation allows you to demonstrate the knowledge, skills and reflective insights you have gained in semesters one and two and at undergraduate level, and apply them to the investigation and/or development of new software systems.

**Course structure**

<table>
<thead>
<tr>
<th>SEMESTER 1</th>
<th>SEMESTER 2</th>
<th>SUMMER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core taught units (30 credits)</strong></td>
<td><strong>Core taught units (18 credits)</strong></td>
<td><strong>Dissertation (30 credits)</strong></td>
</tr>
<tr>
<td>Programming</td>
<td>Research project seminar; Functional programming</td>
<td></td>
</tr>
<tr>
<td>Software engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theory of computation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Databases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research seminar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Optional taught units (12 credits)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select two units</td>
<td></td>
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</tbody>
</table>

A total of 90 credits are awarded for the year.

Optional units may include:
- Entrepreneurship
- Interactive communication design
- Collaborative systems

- Digital media
- Security & integrity
- Cryptography
- Intelligent control & cognitive systems.

Course units are subject to change. See back cover for details.

**MSc Digital Entertainment**

The MSc in Digital Entertainment focuses on the core technologies behind a wide range of digital entertainment and is suited to highly numerate individuals with a strong interest in digital technology. Throughout the course you will explore everything from understanding necessary approaches for creating visual effects, to looking at the relationship between the segmentation, classification and identification of images and video. It will equip you with the knowledge and transferable skills needed for a career in the visual effects, computer animation and computer games industries. Please note, this course is not suitable for students interested in studying the art and design of computer games.

Most lecturing is concentrated in the first two weeks of each semester, giving you the freedom to study independently while working on practical projects. There are also opportunities for you to work alongside doctoral students associated with the Centre for Digital Entertainment – see page 30.

**Course structure**

<table>
<thead>
<tr>
<th>SEMESTER 1</th>
<th>SEMESTER 2</th>
<th>SUMMER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core taught units (30 credits)</strong></td>
<td><strong>Optional taught units (30 credits)</strong></td>
<td><strong>Dissertation (30 credits)</strong></td>
</tr>
<tr>
<td>Computer animation &amp; games 1</td>
<td>Select two units</td>
<td>Will be undertaken in the summer of year two if on the placement course route</td>
</tr>
<tr>
<td>Machine learning &amp; AI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visual understanding 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research project preparation</td>
<td></td>
<td></td>
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<tr>
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</tbody>
</table>

A total of 90 credits are awarded for the year. No credits are awarded for the placement year.

Optional units may include:
- Computer animation & games 2
- Visual understanding 2

- Visual effects

Course units are subject to change. See back cover for details.
MSc Human Computer Interaction
This course will teach you how to design, build and evaluate interactive systems that are fit for people. You will learn to appreciate the multi-disciplinary nature of human computer interaction as a vital discipline in which new understandings of human psychology, communication and social relations underpin design innovation. It is taught by one of the UK’s most successful Human Computer Interaction (HCI) groups whose multi-disciplinary background in research, practice and graduate education will help you to understand the subject. Career opportunities range from designing aspects of consumer devices such as cars, mobile phones or games consoles, through to working on highly sophisticated systems controlling aircraft or power-generating machinery. The course is aimed at students with a background in computer science, psychology or a related discipline.

Course structure

<table>
<thead>
<tr>
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<th>SUMMER</th>
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</thead>
<tbody>
<tr>
<td>Core taught units (18 credits)</td>
<td>Core taught units (24 credits)</td>
<td>Dissertation (30 credits)</td>
</tr>
<tr>
<td>Safety critical systems</td>
<td>Entrepreneurship</td>
<td>Will be undertaken in the summer of year two if on the placement course route</td>
</tr>
<tr>
<td>Software engineering</td>
<td>Interactive communication design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research project preparation</td>
<td></td>
</tr>
<tr>
<td>Optional taught units (18 credits)</td>
<td>Select one unit</td>
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<tr>
<td>Select two units</td>
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</tr>
</tbody>
</table>

A total of 90 credits are awarded for the year. No credits are awarded for the placement year.

Optional units may include:
- Mobile & pervasive systems
- Networking
- Collaborative systems
- Digital media
- Advanced human computer interaction
- Security & integrity.

Course units are subject to change. See back cover for details.
**MSc Software Systems**
The MSc in Software Systems will help you to understand the complexity of engineering a large piece of software, by learning how issues can be managed by a software team and how a complete system can be designed and developed to meet a specification. Relevant modern software applications and digital media are also covered in this course.

There are career opportunities in all major software providers; companies providing web or mobile phone technology, finance and management support, satellite and digital television, and many other modern industries all make extensive use of software systems.

### Course structure

<table>
<thead>
<tr>
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<td><strong>Core taught units (24 credits)</strong></td>
<td><strong>Dissertation (30 credits)</strong></td>
</tr>
<tr>
<td>Internet technology</td>
<td>Entrepreneurship</td>
<td>Will be undertaken in the summer of year two if on the placement course route</td>
</tr>
<tr>
<td>Software engineering</td>
<td>Digital media</td>
<td></td>
</tr>
<tr>
<td>Research project preparation</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Optional taught units (18 credits)</strong></td>
<td><strong>Select two units</strong></td>
<td><strong>Select one unit</strong></td>
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</tr>
</tbody>
</table>

A total of 90 credits are awarded for the year. No credits are awarded for the placement year.

Optional units may include:
- Safety critical systems
- Networking
- Collaborative systems
- Intelligent agents
- Security & integrity.

Course units are subject to change. See back cover for details.
About the Department
Consistently ranked as one of the top ten departments in the UK for both teaching and research, the Department of Mathematical Sciences carries out internationally-leading research in pure mathematics, applied mathematics, probability and statistics. The Department has an interdisciplinary community of over 55 academic staff and researchers and over 1000 undergraduate students.

Why study Mathematical Sciences at Bath?
- Excellent research portfolio – 88% of research was rated as world-leading or internationally excellent in the most recent Research Excellence Framework (REF 2014)
- Excellent graduate prospects with a high proportion finding a suitable occupation within six months
- Approximately half of PhD students are funded, reflecting the Department’s excellent collaboration with industry.

Career opportunities
Many graduates have gone on to further research in Lausanne, Berlin, Brussels, Frankfurt, and academic posts in Malaysia, Sweden, Germany, Canada, USA and the UK. Recent employers have included: British Aerospace, Network Rail, Powerring, Barclays Capital, BNP Paribas, Pfizer, AstraZeneca, MBDA UK Ltd and ATASS.

Research
By working closely with other departments across the University and maintaining close links between research groups within mathematical sciences, the Department’s research has a strong culture of collaboration and mutual support. There have also been a substantial number of new academic appointments over the last few years, adding breadth to the research portfolio whilst reinforcing collaborations between research areas.

Research is divided in to nine main themes:
- Algebra and geometry
- Analysis and differential equations
- Continuum mechanics and waves
- Industrial applied mathematics
- Mathematical biology
- Mathematical control theory
- Numerical analysis
- Probability
- Statistics.

Visit [www.bath.ac.uk/math-sci/research](http://www.bath.ac.uk/math-sci/research) to find out more.

Research Centres
There are four mathematical sciences Research Centres that enhance the interdisciplinary nature of the research: Centre for Mathematical Biology, Centre for Nonlinear Mechanics, Centre for Networks and Collective Behaviour, and the Probability Laboratory at Bath.

See page 3 for a full list of Research Centres.

“Studying at the Department of Mathematical Sciences has provided me with a fantastic world-class education and training. The department houses helpful, enthusiastic and engaging academic members of staff, who are working in exciting fields of research.”

Matthew Lloyd Thomas, Integrated PhD Statistical Applied Mathematics
Taught courses
A fully modular and integrated suite of distance-learning postgraduate courses designed for practising pharmacy professionals is available. Visit www.bath.ac.uk/pharmacy/masters

Research courses
See page 28
About the Department

The Department of Pharmacy & Pharmacology is one of the UK’s leading research hubs in the pharmaceutical sciences. Internationally renowned scientists work collaboratively and across disciplines using state-of-the-art facilities, resulting in output that is consistently ranked among the very best in the field.

The stimulating and challenging research environment of the department attracts high quality students from the UK and overseas, and the award of a Bath PhD consistently opens doors to key positions in industry and academia.

Why study Pharmacy & Pharmacology at Bath?

• One of the leading research centres in pharmaceutical science – ranked 6th in the UK in Allied Health Professions, Dentistry, Nursing and Pharmacy, in the most recent Research Excellence Framework (REF 2014)
• The Department has a long history with and is well established amongst top industry employers
• A scientifically stimulating environment with first class facilities and regular seminar courses featuring internationally renowned speakers
• Some of the best academic staff in the world recognised through their significant research grants and contracts.

Facilities

The Department benefits from well-managed, multi-user research facilities. These include:

• Bioscience Services Unit providing state-of-the art facilities for transgenic animals and in vivo pharmacology
• Chemical Characterisation and Analysis Facility combining cutting-edge analytical equipment (a range of X-ray diffraction, NMR and LC-coupled mass spectrometry apparatus) with extensive in-house expertise
• Microscopy & Analysis Suite offering a comprehensive range of imaging equipment (electron, confocal, high-content, Raman, and scanning probe microscopies, single-cell calcium imaging, flow cytometry and cell sorting)
• Advanced hypoxic imaging facility with expertise essential for research at the chemistry-biology interface.

Additional departmental facilities exist for tissue culture, intra-cellular/patch clamp electrophysiology, and real-time PCR analysis. Research in the department also benefits from a licence to the Clinical Practice Research Datalink (CPRD) database.

For more information on the Department’s facilities visit www.bath.ac.uk/pharmacy/facilities

Career opportunities

Destinations for recent graduates have included management positions in UK Research Councils, postdoctoral research posts in leading UK and overseas research institutes, jobs in the pharmaceutical industry, and positions in scientific publishing.

A number of international students also go on to research and teaching posts in universities in their home countries.

Research

The Department has a long-standing and internationally recognised reputation for high-quality research in the pharmaceutical and pharmacological sciences, spanning the drug development process from target identification and drug design, synthesis and structural optimisation, through to drug formulation and delivery, pharmacovigilance, adherence and drug use. In the most recent Research Excellence Framework (REF 2014), 91% of the Department’s research was rated as world-leading or internationally excellent.

Research is grouped into six main themes:

• Biological chemistry and drug design
• Research in Medicines Design (ReMedDes)
• Inflammation, infection and immunity
• Neuroscience
• Population and lifelong health
• Health services research.

Visit www.bath.ac.uk/pharmacy/research to find out more.

Research Centres

The Department also plays a major role in several multi-disciplinary Research Centres and networks such as the Centre for Sustainable Chemical Technologies (CSCT) and Centre for Regenerative Medicine (CRM) and Cancer Research at Bath (CR@B).

See page 3 for a full list of Research Centres.
Department of Physics

Research courses
See page 28
About the Department
The Department of Physics offers a distinctive environment for studying at all levels, with highly motivated students learning from top physicists through carefully designed study courses. The Department combines ground-breaking research, excellent links with industry and outstanding teaching, resulting in high student achievement and employment.

The Department is a thriving community of around 30 academic staff and over 80 postdoctoral researchers, PhD students, and research visitors, drawn from the UK and overseas.

Why study Physics at Bath?
• Internationally renowned research – ranked 13th amongst all UK departments for research activities in the most recent Research Excellence Framework (REF 2014)
• Award winning academics at the forefront of their field
• Excellent graduate prospects
• State-of-the-art facilities including purpose-built laboratories.

Key facilities
• Optical fibre fabrication cleanroom suite
• David Bullett Nanofabrication Laboratory
• Centre for Graphene Science
• Underwater acoustics
• Free access to Electron Beam Lithography.

For more information on the Department’s facilities visit www.bath.ac.uk/physics/facilities

Career opportunities
Recent graduates have gone on to further research or teaching in the UK, Europe, China and Japan, or research posts in the UK, Germany, Japan and South Africa. Recent employers include the Met Office and Fianium in the UK.

Research
Research in the Department of Physics has a high international profile, in keeping with the University’s position as a leading research institution in the UK. It has been recognised for its national and international impact in the most recent Research Excellence Framework (REF 2014), with 91% ranked as world-leading or internationally excellent.

Research in the Department covers a wide spectrum of activities, from fundamental physics to technological applications. Activities are organised into five research groups and University Research Centres:
• Astrophysics
• Centre for Photonics and Photonic Materials
• Nanoscience Group
• Condensed Matter Theory Group
• Centre for Space, Atmospheric and Oceanic Science.

See page 3 for a full list of Research Centres.
Research courses

Biology & Biochemistry
PhD Biology & Biochemistry
Integrated PhD Biology & Biochemistry
PhD Biosciences (SWBio Doctoral Training Partnership)

Chemistry
PhD Chemistry
Integrated PhD Sustainable Chemical Technologies (SCT Centre for Doctoral Training)

Computer Science
PhD Computer Science
EngD Digital Entertainment (CDE Centre for Doctoral Training)

Mathematical Sciences
PhD Mathematical Sciences
Integrated PhD in Statistical Applied Mathematics (SAMBa Centre for Doctoral Training)

Pharmacy & Pharmacology
PhD Pharmacy & Pharmacology
PhD Biosciences (SWBio Doctoral Training Partnership)

Physics
PhD Physics

Centres for Doctoral Training and Partnerships
See page 30
PhD, Integrated PhD and EngD

Studying a PhD or EngD course allows you to conduct an original piece of research relating to your own experience and interests, leading to a professional research qualification. They are internationally recognised levels of attainment that open up high level career opportunities in academic and industrial sectors.

Bespoke courses are also available through the University’s Centres for Doctoral Training and Doctoral Training Partnerships. These courses are run alongside the traditional PhD and EngD courses and normally involve collaboration with partner institutions, organisations or industry. See page 30 for details.

PhD course structure

Most students who do a traditional PhD register in the first instance as a probationer PhD student. During this probation period, you will be expected to carry out supervised research which must then be written up in preparation for confirmation of your PhD status. The confirmation of the PhD course (and the end of the probationary period) is subject to you passing an assessment process, which normally involves an oral examination. This will usually take place 12 (or in some cases 18) months after the initial registration. The final stage of the PhD degree is the oral or viva voce examination, in which you will be required to defend your final thesis to a Board of Examiners.

Integrated PhD course structure

Although individual course structures vary considerably, students often undertake taught units during the first year (possibly gaining an MRes award at the end of year one). The amount of time you spend on full-time research will gradually increase to 100% from year two onwards. As well as submitting a PhD thesis to the same standard as a traditional PhD, you will gain both generic skills to improve your research and professional skills individually tailored to your needs.

EngD course structure

The EngD in Digital Entertainment is run by the national Centre for Digital Entertainment (CDE) – a collaboration between the University of Bath and Bournemouth University. The four-year course comprises one year of taught units, followed by three research years in a company chosen to match your interests. It leads to an Engineering Doctorate, which is equivalent to a PhD but with lots of practical experience and industry know-how.

Key information

Duration
PhD
Full-time 24 – 48 months.
Part-time 36 – 72 months.

Integrated PhD
MRes and PhD full-time 48 months.

EngD
Full time over 48 months combining taught elements and 75% of time working in industry.

Typical entry requirements
First or upper second class honours degree in a relevant subject (or international equivalent).

Language requirements
IELTS 6.5 (with not less than 6.0 in each of the four components). The EngD in Digital Entertainment requires IELTS 7.0 or equivalent.

Application deadlines
PhD and Integrated PhD
For traditional PhDs there are three entry points in the academic year: October, January and April. Integrated or doctoral training PhD students will normally be required to start in October. For an October start the deadline is August for home/EU and June for international.

EngD
October is the only entry point in the year.

Information on funding
See page 34.

Details are subject to change; for up to date information please contact the Graduate School – see page 4 for contact details.

Now, a year into my PhD, I can confidently say that coming to Bath was a great decision. The help and support I get from my supervisors is the perfect mix of pointers that make me think independently and very direct advice to get me out of binds when my research seems to hit a dead end. I also have access to all the resources a young researcher could hope for, but most importantly, my supervisors let me approach my topic in my own way so that it remains a fun challenge which I love coming back to every day.”

Peter Gracar, PhD Probability
**Centres for Doctoral Training and Partnerships**

The UK has seven Research Councils that coordinate and fund research in the arts, humanities, science and engineering. Part of the role of these Research Councils is to provide research organisations with government funding for postgraduate study. An increasing amount of this Research Council funding is now being channelled through Centres for Doctoral Training (CDTs) and Doctoral Training Partnerships (DTPs).

The University of Bath, in collaboration with partners, has secured funding from Research Councils for 12 centres and partnerships, most of which are in science-related areas. These provide PhD and EngD students with bespoke courses that include taught and research elements, as well as the opportunity to interact with partner institutions, organisations or industry.

The Faculty of Science is involved in the following CDTs and DTPs:

- **EPSRC Centre for Digital Entertainment (CDE)**
  Based at Bath and Bournemouth Universities, the CDE is a Centre for Doctoral Training funding doctoral researchers in games, visual effects or animation companies. The four-year doctoral degree comprises one year of taught study at Bath or Bournemouth, followed by three research years, fully embedded in a company chosen to match a student’s interests. Students are supervised at all times by the University.

- **EPSRC Centre for Doctoral Training in Catalysis**
  The Catalysis-CDT is hosted by Bath, Bristol and Cardiff Universities, and covers disciplines in science and engineering. It has been established with the support of the EPSRC to provide PhD training across heterogeneous and homogeneous catalysis as well as reaction engineering. The four-year doctoral training course begins with an intensive six-month taught course. Research skills will be developed through two research sabbaticals based in the departments of host universities, before moving onto PhD research in years two to four.

- **EPSRC Centre for Doctoral Training in Condensed Matter Physics**
  Jointly based at the Universities of Bristol and Bath, the Centre aims to train students across a broad range of disciplines in the field of hard condensed matter physics, encompassing experiment, theory, fundamental physics and device applications. In the first year students undertake an MRes course hosted by the University of Bristol but with taught courses and exploratory research projects at both Bath and Bristol before commencing a PhD at either institution.

- **EPSRC Centre for Doctoral Training in Water Informatics: Science and Engineering (WISE)**
  WISE is an innovative research venture between the GW4 alliance universities: Bath, Bristol, Cardiff and Exeter. Working closely with industrial and international academic partners, the four-year course offers an advanced PhD experience, including taught elements in the first year, designed to train highly qualified postgraduate students as the next generation of skilled water scientists and engineers. The course is closely linked to the University’s Water Innovation and Research Centre – WIRC @ Bath – which benefits from a strategic partnership with Wessex Water that supports research and postgraduate training at the cutting edge of innovation in the water industry.

- **EPSRC Centre for Doctoral Training in New and Sustainable Photovoltaics**
  A group of seven universities – led by Liverpool and including Bath, Cambridge, Loughborough, Oxford, Sheffield and Southampton. The Centre trains highly-skilled students capable of transforming state-of-the-art research and development across the sustainable energy and PV sectors.

- **EPSRC Centre for Doctoral Training in Statistical Applied Mathematics**
  SAMBa is an innovative four-year doctoral course that builds on, and brings together research carried out in the Department of Mathematical Sciences, working in collaboration with industry, policy-makers, and academics from other disciplines. The first year of SAMBa primarily consists of taught material and short research projects that will lead to the development of a three-year research course and a PhD qualification.

- **EPSRC Centre for Doctoral Training in Sustainable Chemical Technologies**
  The Bath-based CDT, brings together academic expertise from the University of Bath with international industrial, academic and stakeholder partners to carry out research, training and outreach in sustainable chemical technologies. The four-year Integrated PhD in Sustainable Chemical Technologies comprises two small research projects, technical training and transferable skills training in year one, followed by a main PhD project and advanced training courses in years two to four. Research is directed by supervisors from a number of departments including Chemistry, Chemical Engineering, Biology & Biochemistry, Electrical Engineering, Mathematical Sciences, Mechanical Engineering, Pharmacy & Pharmacology and Physics.

- **EPSRC Centre for Doctoral Training in Statistical Applied Mathematics**
  SAMBa is an innovative four-year doctoral course that builds on, and brings together research carried out in the Department of Mathematical Sciences, working in collaboration with industry, policy-makers, and academics from other disciplines. The first year of SAMBa primarily consists of taught material and short research projects that will lead to the development of a three-year research course and a PhD qualification.

- **The MRC GW4 BioMed Doctoral Training Partnership (DTP)**
  The MRC GW4 BioMed Doctoral Training Partnership (DTP) brings together the Universities of Bath, Bristol, Cardiff and Exeter to develop the next generation of medical researchers, helping them to be collaborative, curious, critical and confident.
Students will have access to the combined research strengths, training expertise and resources of the four research-intensive universities, with opportunities to participate in interdisciplinarity and ‘team science’.

The MRC GW4 BioMed DTP offers an outstanding combination of research excellence, critical mass, joint training experience and geographical proximity coordinated by a well-established infrastructure.

**EPSRC Centre for Innovation Manufacturing in Continuous Manufacturing and Crystallisation (CMAC)**

The Centre’s collaborative course is delivered by a multidisciplinary academic team that involves colleagues at the Universities of Bath, Cambridge, Edinburgh, Glasgow, Heriot-Watt, Loughborough and Strathclyde. The CMAC DTC offers a dynamic and exciting training course delivered across the partner sites to equip students with the necessary skills across the interdisciplinary areas required to tackle research challenges that will deliver improved solid form and particle attributes for fine chemicals and pharmaceuticals manufacturing.

**NERC GW4+ Doctoral Training Partnership in Environmental Sciences**

The DTP is a partnership of research-intensive GW4 universities – Bath, Bristol, Cardiff and Exeter, with six Research Organisations (including the Natural History Museum, British Antarctic Survey, Plymouth Marine Laboratory and the Met Office) and a number of Associate Partners. The broad range of research supported by NERC is represented by the three themes: Solid Earth, Living World and Changing Planet, attracting students with backgrounds in biological sciences, chemistry, physics, mathematics or engineering. Students undertake a bespoke PhD training course, which includes opportunities for collaborations between the institutions and research organisation partners.

For a full list of University Doctoral Training Centres and partnerships visit [www.bath.ac.uk/study/pg/funding/research/doctoral-training-centres/index.html](http://www.bath.ac.uk/study/pg/funding/research/doctoral-training-centres/index.html)
How to apply – MRes and MSc

Find a course
(MSc or MRes)

Complete an online application form
Applications must be made online at: www.bath.ac.uk/study/pg/applications.pl
After registering, you will be provided with a username and password to log in to your application.

To process your application we will need:
• A scan of your original academic transcript(s) for all previous degrees, plus an official English translation (if applicable)
• A scan of your original degree certificate(s) for all previous degrees, plus an official English translation (if applicable)
• A scan of your approved English language result (not applicable for native English speakers)
• Two academic references, or the names and email addresses of two academic referees
• An up-to-date CV.

Application deadlines for entry in September:
UK/EU – 1 August
International – 30 June

Track your application
Follow the progress of your application via the Application Tracker System, using your username and password. Once you have submitted a full application (including all of the documents shown above) you should expect to have a decision within 4 weeks.

Accept your offer
If your application is successful and you are made an offer of a place on one of our postgraduate courses, you can accept (or decline) your offer via Application Tracker.

It is important that you accept your offer as soon as possible, even if you have conditions associated with it, so that a place can be reserved for you. You will need to accept a valid offer from us in order to be eligible to apply for funding scheme(s).

The Academic Technology Approval Scheme (ATAS)
Those needing a Tier 4 student visa to study on courses that require security clearance via ATAS will need to obtain a clearance certificate before applying for their visa. If you are made an offer, we will inform you if you need to apply for a ATAS certificate. You should not try to apply for a certificate until you have been notified by us that you need to do so. Find out more at www.bath.ac.uk/pg-offer-holders/visa-advice/atas

Meet your offer conditions
If your offer is conditional, you will need to supply evidence that you meet these conditions as soon as you can. You can upload any documents via Application Tracker.
How to apply – PhD and EngD

**Step 1** Find the research course you are interested in (PhD, Integrated PhD, EngD, doctoral training course)

Considerations:
- Type of course e.g. do you just want to do research or would you prefer a course including a formal taught element?
- Funding e.g. are you looking to apply for a funded studentship or do you have an alternative source of funding support?

**Step 2** Identify an available research project and supervisor

After investigating the research strengths of academics within the relevant department and identifying a potential supervisor, contact the supervisor to see if he/she has any current projects you could work on and/or search for advertised projects on our website or via www.findaphd.com and www.jobs.ac.uk

**Step 3** Complete an online application form

Applications must be made online at: www.bath.ac.uk/study/pg/applications.pl

After registering, you will be provided with a username and password to log in to your application.

To process your application and to apply for funding you will need:

To upload a Funding Support Statement with your application and clearly indicate which funding you wish to be considered for in the Finance section of the online application form.

If you have already secured funding support, or if you are applying for external funding, you will need to provide details of scholarships and sponsors in the Finance section of the online application form.

**Application deadlines for entry in September:**
- UK/EU – 1 August
- International – 30 June

**Step 4** Track your application

Follow the progress of your application via the Application Tracker system, using your username and password. Once you have submitted a full application (including all of the documents shown above) you should expect to have a decision within 6 weeks.

**Step 5** Accept your offer

If your application is successful and you are made an offer of a place on one of our postgraduate courses, you can accept (or decline) your offer via Application Tracker.

It is important that you accept your offer within the time limit detailed in your offer letter, even if you have conditions associated with it, so that a place can be reserved for you. You will need to accept a valid offer from us in order to be eligible to apply for funding scheme(s).

**The Academic Technology Approval Scheme (ATAS)**

Those needing a Tier 4 student visa to study on courses that require security clearance via ATAS will need to obtain a clearance certificate before applying for their visa. If you are made an offer, we will inform you if you need to apply for a ATAS certificate. You should not try to apply for a certificate until you have been notified by us that you need to do so. Find out more at www.bath.ac.uk/pg-offer-holders/visa-advice/atas

**Step 6** Meet your offer conditions

If your offer is conditional, you will need to supply evidence that you meet these conditions as soon as you can. You can upload any such documents via Application Tracker.
Funding

Each year we have a range of funding available for both home and international students undertaking postgraduate study within the Faculty of Science. Funding opportunities may include studentships, scholarships (including international scholarships), and postgraduate bursaries.

**Postgraduate loans for Home UK and EU students**
Postgraduate loans of up to £10,000 are available for master’s courses. Find out more at: www.bath.ac.uk/study/pg/funding/taught/postgraduate-loans-for-masters-courses/index.html

**PhD/EngD studentships**
Our studentships provide full funding (fees, maintenance and training support) for postgraduate research students. The University funds a number of studentships for students in Science, whilst most other studentships are funded by UK Research Councils (e.g. BBSRC, EPSRC, NERC, MRC) via Centres for Doctoral Training, Doctoral Training Partnerships, Doctoral Training Grants, or other funding mechanisms.

**PGT scholarships**
Our highly prestigious PGT scholarships are awards made to outstanding students, with the primary selection criteria being academic excellence.

**PGT Bursaries**
A limited number of postgraduate bursaries are awarded to taught postgraduate students who meet the eligibility criteria.

**Overseas external funding**
We welcome applications from overseas students who have secured or are in the process of securing sponsorship from external funders, such as Government or University Scholarships.

**External funding**
The Alternative Guide to Postgraduate Funding Online can help you find alternative sources of funding, like charities. These sources can make awards for fees, maintenance or research costs to any student, regardless of subject or nationality. The Guide contains a database of funding opportunities, comprehensive guidance and tools to help you prepare a winning grant application. Visit www.postgraduate-funding.com to find out more.

**Useful links**
Current funding opportunities for taught courses: www.bath.ac.uk/science/graduate-school/taught-programmes/funding/
Current funding opportunities for research courses: www.bath.ac.uk/science/graduate-school/research-programmes/funding/
Tuition fees: www.bath.ac.uk/study/pg/fees/

Academic skills and English language courses

The University’s Skills Centre offers free academic skills and English language courses to all postgraduate students. The aim of the service is to prepare you for study at the University and to provide support so that you can attain the highest levels of academic achievement in your studies and future careers.

All courses are delivered by a team of highly qualified and experienced teachers, working closely with academic and Professional Services colleagues across the University.

The Centre can provide help and support with many aspects of postgraduate study including academic writing, written and spoken communication (including English language), reading and listening for information, avoiding plagiarism, giving presentations, critical thinking and writing.

The Centre delivers a programme of workshops, tutorials and courses:
- Skills sessions embedded within academic courses
- Year round study-skills classes and workshops
- Writing tutorials from the Writing Centre
- Pre-sessional programmes preparing prospective students for University study
- General English courses
- Self-study skills learning materials online
- Language learning through the Self Access Language Centre (SALC)
- English language testing through the International English Language Testing Centre (IELTS).

More information is available on the Skills Centre website: www.bath.ac.uk/asc/

"Having had the best experience at the university as an undergraduate, I knew that continuing as a postgraduate was the right decision for furthering my education. The university’s reputation, along with its vibrant atmosphere and strong sense of community made my original decision to study the university an easy one. Bath is a fantastic city to live and study in!"

Matthew Lloyd Thomas, Integrated PhD Statistical Applied Mathematics
Living and studying at Bath

The city of Bath
Bath is a beautiful UNESCO world-heritage city. Its striking Georgian architecture, Roman Baths and medieval Abbey make it one of the most remarkable cities in Europe. It is a great place to be a student with a good selection of shops, restaurants, cafes and attractions as well as excellent bus links to and from campus and good train links to the cities of London and Bristol.

Find out more about the city of Bath on the official tourism website: www.visitbath.co.uk

University of Bath
The University of Bath is a small but vibrant community campus, located just one mile from the city centre. It is a very safe place to study and was one of the first universities to be awarded with a national police security award. Everything you need as a student is on campus including cafes, a grocery store, banks, a dentist, medical centre and chaplaincy.

Graduate Centre
A dedicated social and informal work space at the heart of the campus for postgraduate students and staff. The Centre is a great place to meet colleagues, attend training and events or to just relax; it includes informal work spaces, soft seating, seminar and meeting rooms, kitchen facilities and a large screen television. www.bath.ac.uk/students/support/learning-resources/gradcentre

Library
The University library on-campus is open 24 hours a day, 365 days a year. As a student here you will have access to hundreds of books and articles many of which can also be accessed online. You will also have access to many computers around campus and Wi-Fi hotspots. www.bath.ac.uk/library

International Relations Office
Provides support and assistance to an international community of over 100 nationalities. www.bath.ac.uk/study/international
Student Services Centre
The first point of contact for a range of information and support services including funding advice, counselling and wellbeing. www.bath.ac.uk/students/services/centre

The Disability Service
Provides information, advice and support for students with a disability including help with Disabled Students Allowance and alternative exam arrangements. www.bath.ac.uk/students/services/centre/disability-service

Careers Service
Offers careers information, advice and guidance to students, with links to thousands of employers in the UK and overseas. www.bath.ac.uk/students/careers

Students’ Union
Consistently rated as one of the best students’ unions in the country. Services include student welfare advice, representation, skills training, peer support, events, sports and societies. www.bathstudent.com

The Arts
There are many ways you can get involved in the arts at Bath. The Edge offers a range of discounted classes in dance, music and visual arts as well as free practice facilities. There is also an extensive programme of live performances, exhibitions and concerts. www.bath.ac.uk/arts

Sports Training Village
A £30 million Olympic style sports training village, offering some of the best sporting facilities in the country including an Olympic sized swimming pool, athletics track and fully-equipped gym. Students have access to the facilities seven days a week. www.teambath.com/facilities

Accommodation

International students
The University has off-campus accommodation available for international postgraduate students, located in the city centre of Bath.

University accommodation is guaranteed to international students providing the deadline is met and you meet the eligibility criteria. Find out more: www.bath.ac.uk/study/pg/accommodation

Please note, due to limited spaces University accommodation is not available for UK and EU postgraduates. Most students look for private sector accommodation in Bath city centre.

UK and EU students
A range of private sector accommodation is available in Bath and the surrounding area from shared houses to lodgings. There are many resources available to help students find accommodation, including the University’s recommended search engine, the Bath Student Pad. www.bathstudentpad.co.uk/accommodation

The Student Accommodation Service also offers advice and information to students looking for private sector housing, from information on where to live, to checking contracts and providing legal advice. www.bath.ac.uk/accommodation/private-housingfinding

Resident Tutors
As a postgraduate student you can apply to be a Resident Tutor. This role involves supporting students in University accommodation and comes with furnished accommodation free of charge. You need to be committed to becoming a Resident Tutor as you will be required to be on duty one night per week and one weekend in four during term time, as well as attend regular meetings and training sessions.

In order to meet the application requirements of this role you need to have a substantive connection to the University (working a minimum of 20 hours per week). www.bath.ac.uk/accommodation/welfare/resident
Living costs

In addition to tuition fees, you will need to budget for additional costs such as accommodation, food, travel and social activities.

Expenditure
(based on typical academic year of 38 weeks unless otherwise stated. Please Note: Postgraduate contracts are for 50 weeks & 2 days)

<table>
<thead>
<tr>
<th></th>
<th>Per Week</th>
<th>Per year (52 weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rent</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postgraduate University</td>
<td>£152.00</td>
<td>£7,904.00</td>
</tr>
<tr>
<td>(Ranges from £108 - £206 per week). Average costs - £152 p/w (including accommodation for couples)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Off Campus in Bath</td>
<td>£94.00</td>
<td>£4,888.00</td>
</tr>
<tr>
<td>averages £94 per week.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bills not inclusive</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Food, Toiletries,</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Household goods</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility Bills (gas, water, electricity)</td>
<td>£15.00</td>
<td>£780.00</td>
</tr>
<tr>
<td>Off campus accommodation only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University Launderette (One wash and tumble dry per week)</td>
<td>£4.00</td>
<td></td>
</tr>
<tr>
<td><strong>Clothes</strong></td>
<td>£7.00</td>
<td></td>
</tr>
<tr>
<td><strong>Travel, local &amp; outside of Bath</strong></td>
<td>£14.00</td>
<td></td>
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<tr>
<td>(public transport)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Leisure/Social/Sport</strong></td>
<td>£30.00</td>
<td></td>
</tr>
<tr>
<td><strong>TV licence</strong></td>
<td>£2.80</td>
<td></td>
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<tr>
<td>12 months</td>
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<tr>
<td>(rate from 1st April 2016. Refunds are available on any unused part of the annual fee. See <a href="http://www.tvlicensing.co.uk">www.tvlicensing.co.uk</a> for more information)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mobile Phone</strong></td>
<td>£5.00</td>
<td></td>
</tr>
<tr>
<td><strong>Health Costs</strong> (e.g. contact lenses, dentist, prescriptions etc)</td>
<td>£4.00</td>
<td></td>
</tr>
<tr>
<td><strong>Course costs</strong> (these can vary depending on the course so check with your Department)</td>
<td>£9.00</td>
<td></td>
</tr>
<tr>
<td><strong>Your own allowance for Emergencies/Other</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>£280.00</td>
<td>£14,560.00</td>
</tr>
<tr>
<td>(students living in University owned accommodation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>£237.00</td>
<td>£12,324.00</td>
</tr>
<tr>
<td>(students living in private accommodation)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These costs don’t include tuition fees, flights or visa charges. For details of funding and sponsorship please see page 34.
Faculty of Science

Postgraduate courses in:
Biology & Biochemistry
Chemistry
Computer Science
Mathematical Sciences
Pharmacy & Pharmacology
Physics

Get in contact
Email: fsci-pgadmissions@bath.ac.uk
Telephone: +44 (0)1225 383410
www.bath.ac.uk/science/graduate-school

There may be rare occasions where due to unforeseen or unavoidable circumstances it becomes necessary to make significant changes to a course or to withdraw it or part of it (e.g. a particular unit/module). Visit www.bath.ac.uk/study/pg/applicants/changes-withdrawal
Find out more about this and other important University terms and conditions: http://go.bath.ac.uk/pgp-important-terms