



hpc health
professions
council



BSc (Hons) Biomedical Science

which can lead onto

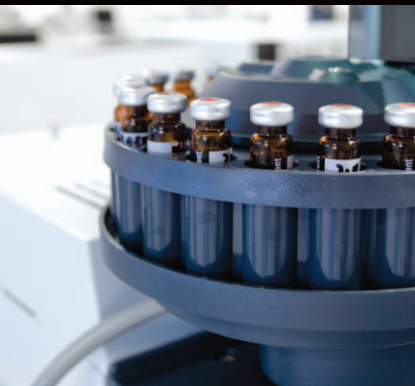
BSc (Hons) Healthcare Science

(Life Science routes) - with opportunity
to do integrated clinical placements in years 1, 2 and 3

lifechanging



University of
Sunderland



Biomedical Science at Sunderland

The BSc (Hons) Biomedical Science programme at the University of Sunderland is an ideal way to obtain a nationally accredited degree which will enable you to practice in the NHS as a Biomedical Scientist. Our focus on laboratory and practical skills also provides an excellent foundation for working in the life sciences (eg in industry or research).



What is Biomedical Science?

Biomedical Science is the study of disease or pathology. Biomedical Scientists analyse specimens from patients to provide clinical colleagues with the information needed to diagnose and treat disease. This programme is accredited by the Institute of Biomedical Science (IBMS). In addition, our BSc (Hons) Applied Biomedical Science (a 4 year programme which includes an integrated clinical placement) is also approved by the Health Professions Council and leads to eligibility to join the HPC register as a Biomedical Scientist following graduation. There are numerous other career routes available following this degree including research, industry, sales and teaching.

Our degree programme provides you with the knowledge and skills required for real life science. We place an emphasis on laboratory skills using up to date equipment and have strong external links to the health care sector. It is supported by an active research base in the life sciences including postgraduate programmes and innovative projects. Our graduates have a wide range of analytical and intellectual skills so that they are flexible employees with a broad view of the industry and able to adapt to its many future possibilities.

“ Why come to Sunderland? I think the one overriding factor is that we provide excellent biological theory that is supported throughout the programme with extensive laboratory practicals and we provide all students with a final year laboratory based project. This means you will develop the skills to compete in the job market in any area of science, the NHS, Industry or research. You simply cannot learn to be a scientist out of a textbook. ”

Dr Noel Carter,
Senior Lecturer in Molecular Biology and Admissions Tutor



“ This is a fantastic university, the modules included are very relevant to working in a pathology laboratory. I think that every student should go on a placement year, or have placements integrated in the course as it gives a real life aspect of what the job entails and whether it's a career that the student really wants to pursue. My placement year was very useful as it showed how much responsibility is involved with the work BM Scientists do and how that responsibility changes the higher up the scale they go. It also gave me an edge when I was applying for jobs as I have had work experience, something that sets you apart from other graduates. Proof of this is that I have already got a job before I've even taken my exams, never mind graduated! ”

Kate Mulholland,
BSc (Hons) Biomedical Science

A great range of programmes

BSc (Hons) Biomedical Science UCAS CODE (B940)

This degree is nationally accredited by the Institute of Biomedical Science (www.ibms.org) and allows students to enter the profession as a trainee Biomedical Scientist. We also encourage our students to do an optional clinical placement year in an NHS laboratory. This 40 week integrated clinical placement allows students to complete their IBMS registration portfolio and graduate with the health professions council (www.hpc-uk.org) approved title 'Applied Biomedical Science'. They are eligible to join the HPC as a Biomedical Scientist (which is a protected title) following graduation.

You will learn how scientific research leads to more specific and effective treatments for many of the diseases that threaten our health, such as cancer, AIDS, autoimmunity and diabetes. In the past many of these diseases have been treated on a trial and error basis. However, with the expansion of our knowledge of how the body functions, the potential to target drugs to specific changes and defects in diseased cells becomes ever more accurate.

Students who wish to do a series of shorter integrated placements (10 weeks in year 1, 15 weeks in year 2 and 25 weeks in year 3) will have the opportunity to change course to;

BSc (Hons) Healthcare Science (Life Sciences route) (CID 1069)

- **Blood Science**
- **Cellular Science**
- **Genetic Science**
- **Infection Science**

These programmes have the same on campus taught elements as Biomedical Science but include a series of integrated clinical placements each year in an approved clinical training laboratory. They have been approved by Medical Education England as part of the Practitioner Training Programme (PTP). This will prepare future healthcare scientists to analyse specimens from patients to provide data to help diagnose and treat disease. They should be able to perform a range of complex clinical, scientific and technical procedures and be accountable for their own actions. Students who successfully complete work based learning in a clinical laboratory will graduate with the appropriate discipline specific Healthcare Science degree title BSc (Hons) Healthcare Science (Blood Science/Cellular Science/Genetic Science/Infection Science). Students will also have the opportunity to complete their IBMS registration portfolio, but will also complete the PTP training manuals (as defined by the Modernising Scientific Careers curriculum).

Course structure and modules

Level 1: This level is all about getting everyone to the same level and providing the basic life science that is the foundation for your studies.

- Analysis and Measurement
- Human Physiology
- Biological Chemistry
- Cell Science 1
- Infection and Immunity
- Clinical and Professional Skills

Level 2: This level starts to really look at application of biomedical science to the study and detection of disease. We focus on the acquisition of practical skills relevant to practice in Pathology disciplines.

- Analysis and Measurement
- Human Physiology
- Biological Chemistry
- Cell Science 1
- Infection and Immunity
- Clinical and Professional Skills

Level 3: This level builds upon Level 2, and you have the opportunity to choose 4 / 7 specialist options. It includes a compulsory individual laboratory based research project, giving you a chance to do new and cutting-edge science that has never been done before. You will have the opportunity to troubleshoot, design experiments, test hypotheses, analyse and interpret results and produce a critical review of relevant literature.

- Biomedical Project
- Pathophysiology
- Cellular Pathology
- Clinical Biochemistry
- Molecular Pathology
- Immunology
- Haematology and Blood Transfusion
- Human Genetics and Genomics
- Medical Microbiology

Sandwich Year – Optional industrial or clinical placement year between Levels 2 and 3.

Final year laboratory project

The biomedical project places the student in a research laboratory. In the project you will gain high level skills in specialist techniques. Project areas include molecular biology, immunology, medical and environmental microbiology, clinical and analytical biochemistry, physiology. They generally relate to the research interests of individual faculty members, for example:

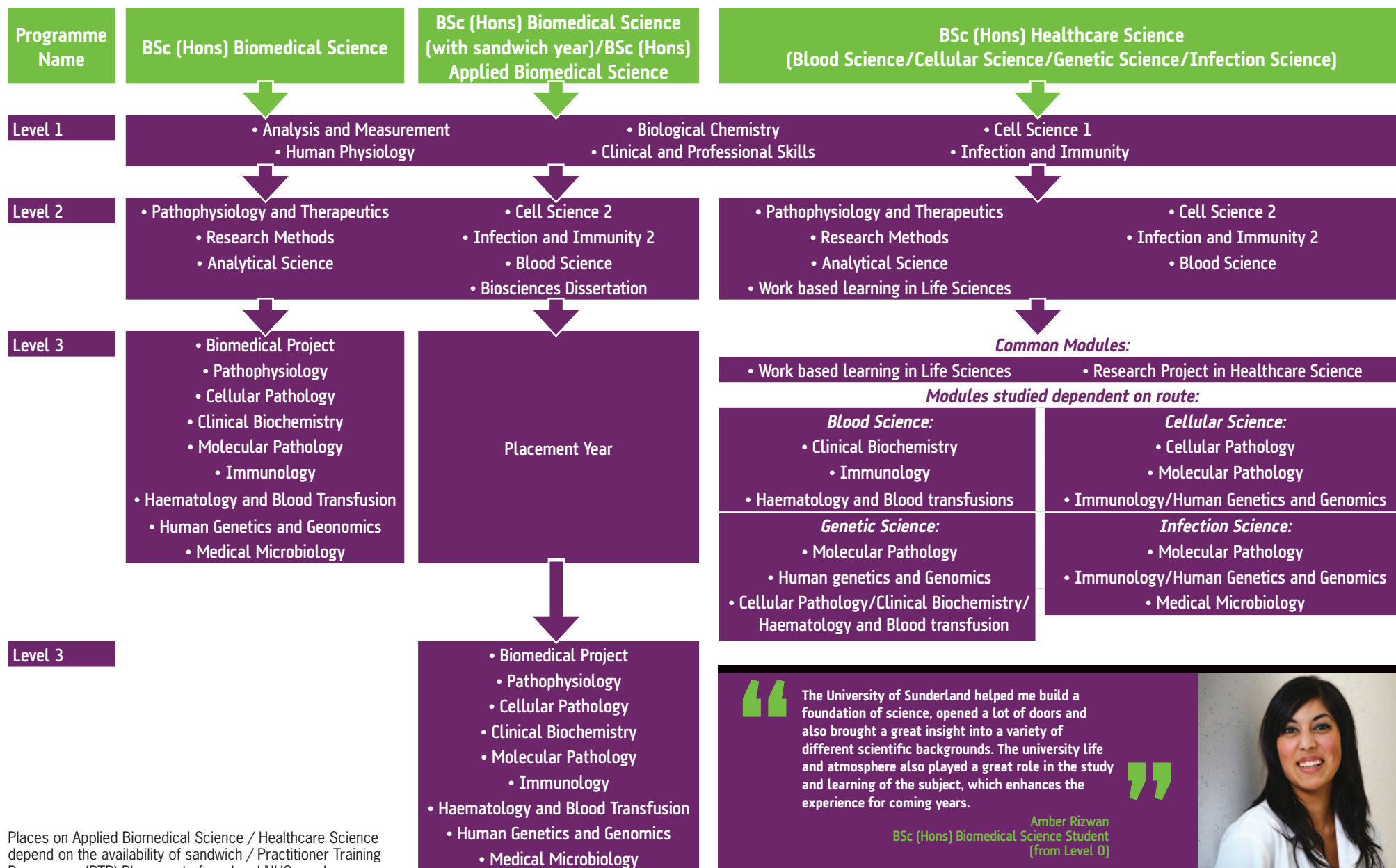
Analysis of urine for biomarkers

We collaborate with a number of health care institutions within the region and many of our final year research projects have direct clinical applications. One of our interests is in trying to identify proteins in urine to diagnose disease for example rejection of organs like kidneys. A number of our students have done final year projects looking at the proteins in urine to try and detect "biomarkers" that indicate a particular disease. These projects have used molecular methods such as 2-dimensional gel electrophoresis and mass spectrometry. The aim of our final year laboratory projects is to provide clinically relevant themes and provide training in practical skills that employers value.



Programmes available

(Note: Healthcare Science have extended terms)



Places on Applied Biomedical Science / Healthcare Science depend on the availability of sandwich / Practitioner Training Programme (PTP) Placements from local NHS employers.



The University of Sunderland helped me build a foundation of science, opened a lot of doors and also brought a great insight into a variety of different scientific backgrounds. The university life and atmosphere also played a great role in the study and learning of the subject, which enhances the experience for coming years.

Amber Rizwan
BSc (Hons) Biomedical Science Student
(from Level 0)





Teaching and assessment

Learning strategies are designed to be innovative, flexible and are built upon established practices within the University. As such, there are a variety of different delivery modes that address different learning styles, and support and encourage active student participation. The format of these range from;

- E-learning
- Formal lectures/tutorials/workshops
- Industrial visits
- Practical laboratory work and independent research projects

Assessment throughout the programme uses a diverse range of methods that are appropriate to the learning outcomes of the modules, and aim to motivate learners, for example, written coursework, projects, poster and oral presentations, case studies, time constrained tests, multiple choice questions and seen and unseen examinations. Our external examiner has positively commented on the innovative nature of our assessment and feedback methods.

Entry Requirements

For information on entry requirements please visit our website.

www.sunderland.ac.uk

Career opportunities

The size and diversity of the health industry offers many opportunities for graduates, and employment prospects are excellent. Over the last four years between 90-100% of our students gained employment or were in further study within six months of graduating. The majority of our graduates, more than 75%, choose careers that relate directly to their studies, for example, as biomedical scientists in the NHS, medical research institutions or universities, in clinical laboratories, drug companies, veterinary work, laboratory forensics, scientific writing, medical sales and clinical trials. Graduates also become management trainees with a wide range of companies. A number extend their studies and proceed to MScs, PhDs or take up careers in medicine, dentistry or pharmacy while others go into teaching. We take students with a basic science background and help them to evolve into specialist scientists in a variety of complex fields, such as medical microbiology, immunology, haematology, cellular pathology and clinical biochemistry.

Teaching staff

They have worked in the NHS as biomedical scientists, clinicians and surgeons; we also have staff who have worked in both industry and academia looking at the biology of human disease. We also work closely with current biomedical scientists in the NHS at both a regional level and national level who come in and deliver lectures, facilitate student visits and ensure our programmes of teaching and research are current and relevant. We have links with the regional hospitals and other universities as well as a number of collaborations with national and international collaborators. Our research is varied and we're currently investigating:

- Improving the quality of organs for transplantation
- The genetics of autism
- How the immune system responds to exercise
- Environmental factors of childhood asthma
- Air quality and human health
- The role of the immune system in psoriasis
- How bacteria infect humans and animals
- How to detect bacteria in the environment

The experience of our staff ensures that our teaching isn't just straight from a textbook. All the courses are up-to-date, supported by research, professional practice and combined with a dedication and commitment to ensure you achieve your personal goals.

“ I believe the key thing about this course is that it offers you opportunities - to study science in-depth and to develop your practical skills, but more importantly, to reach your potential. We are a supportive group of staff who want the best for each and every student, not just by providing a stimulating and interesting course, but also in the development of important skills and attributes which will help to make you a highly employable graduate. ”

Dr Anne Cunningham
Principal Lecturer (Immunology) and
Programme Leader



Level 0 Extended Programme in Biomedical Science UCAS CODE (B948)

Even if you do not have the formal entry requirements for a degree, our door is not closed to you. Complete this Level 0 programme to bring you up to the required standard and you are guaranteed a place on the Biomedical Science degree programme.

The programme provides a solid grounding in science and the study skills needed to tackle a degree. If you successfully complete your foundation year (Level 0) you progress to the first year of your chosen degree.

This programme is delivered at Sunderland College – Shiney Row.

There are three main modules; Biology, Chemistry and Physiology.

You will also study Mathematics, Statistics, Information Technology and Study Skills.

Teaching and Assessment

Presentations, research essays, laboratory reports and examinations. An average is taken of all the assessments and the benchmark pass is 40%. In both semesters, there are visits to the University with students participating in lectures, seminars and laboratory experimentation.

During the programme you will experience a combination of teaching and learning styles as follows:

- **Classroom teaching**
- **Laboratory practical work**
- **Library**
- **Learning resource centre work**
- **Information technology activity**
- **Seminar work**
- **Tutorials**
- **Directed work with other students**

Entry Requirements

Students with a non scientific background wishing to retrain in science: Students who have completed study to at least AS Level in any subject. Ideally 4 GCSEs at grade C or above. However students without these qualifications may still be accepted for the course following an interview.

**For further information, please contact
Sunderland College on:
0191 511 6109 / 0191 511 6526**



State of the Art Facilities

Sciences Complex

The new look sciences complex has considerably strengthened our reputation, particularly in the region, by supporting local business and industry. The new facilities include; a modern, well-equipped and outward facing environment which support high quality skills provision, applied research, knowledge transfer and business support activities. The new facilities include;

- A new central hub to the suite of buildings, creating a highly visible entrance area and reception
- High quality teaching and learning facilities, including a brand new CPD suite for training health and pharmaceutical professionals
- High quality, multi-disciplinary science laboratories, including new facilities for proteomics, drug discovery, pharmacy, and health sciences
- A new integrated industry-standard Analytical Services lab and scientific imaging suite
- High quality social learning spaces for staff, students, and external stakeholders
- Exhibition space to promote science to industry and the health professions
- New public square and landscape

On Campus

Our facilities are modern with recently built laboratories containing state-of-the-art facilities for molecular biology, immunology, microbiology, cell biology and physiology. We have a range of specialist equipment that permits biological analysis from the level of the DNA right up to whole organs and organisms. All of this equipment is used within the undergraduate curriculum to inform teaching and includes:

Gene analysis: Determining if gene sequences are present, switched on or if their sequence changes help biomedical scientists to detect micro organisms right through to determining the genetics of humans. We have facilities to perform standard and quantitative polymerase chain reaction (PCR), gel electrophoresis, genetic analysis of single nucleotide polymorphisms (SNPs).

Microscopy: Looking at cells can help detect bacteria or determine if someone has cancer by looking at samples under a microscope. We support teaching of this with a range of microscopes; light, fluorescence, electron and laser scanning con-focal.

Cell and organ analysis: It is important to understand how cells and tissues behave biologically. We can count cells and measure proteins and other molecules by a powerful technique flow cytometry.

Physiology and Pharmacology: We have a range of equipment to measure normal and aberrant physiology such as ECG and the ability to link this to how drugs and therapies effect tissues and organs.

Robotic sample handling: Increasingly automation is playing a role in the biomedical sciences and we have a number of robotic systems to facilitate our science.

Our staff are research active and engage in direct contact with the health care sector to ensure their fields are up to date and relevant to the outside world.

How to Apply

For all Undergraduate and Level 0 Programmes

Applications for entry must be submitted through UCAS (Universities and Colleges Admissions Service). For further details go to

www.ucas.ac.uk or

Tel: **+44 (0) 870 112 2211**

When completing your UCAS form please use the following code for the University of Sunderland – S84.

BSc (Hons) Biomedical Sciences
UCAS CODE (B940)

Level 0 Extended Programme in Biomedical Science
UCAS CODE (B948)



For further information

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www.sunderland.ac.uk