BIOMEDICAL SCIENCE
Canterbury
Kent is one of the UK’s leading universities, ranked 23rd in The Guardian University Guide 2017. In the Research Excellence Framework (REF) 2014, Kent is ranked 17th* for research intensity, outperforming 11 of the 24 Russell Group universities.

World-leading research

The School of Biosciences at Kent ranks among the most active in biological sciences in the UK, with research funding at about £4.5 million per year. Outside bodies have commended the School for its research, which is acknowledged to attain international levels of excellence. In the REF 2014, all of our research was judged to be of international quality and, based on our results in the REF, we were ranked 7th in the UK for research intensity in the Times Higher Education (THE).

The research in the School is focused on understanding systems and processes in the living cell. It has a molecular focus and covers the disciplines of biochemistry, microbiology and biomedical science. The research projects currently ongoing in the School include: cancer biology and cancer therapies, bioprocessing and the development of novel therapeutics, genetic and prion diseases, virology, parasitology, reproductive medicine, synthetic biology, protein folding and structural biology, the biology of aging, molecular motors, and bacterial pathogenesis and sensing.

Our research feeds directly into our teaching, providing exciting and relevant final-year projects, well-equipped and well-resourced laboratories, and ensures that you learn the most up-to-date science possible.

Teaching excellence

The School of Biosciences was awarded the maximum score of 24 in its teaching quality assessment, achieving full marks in areas such as the design and delivery of teaching materials, and the support and guidance we give our students. The assessors concluded that the School of Biosciences offers ‘well designed, flexible and coherent degree pathways, taught by dedicated and enthusiastic staff well-matched to the syllabus and clearly informed by industry and research’.

This reputation for teaching excellence is reflected in the National Student Survey. For example, in the subject area of Biomedical Science, Kent has been rated as one of the top 10 UK universities for overall course satisfaction in seven of the last nine years. In the most recent survey (2015), 96% of our Biomedical Science students reported that they were satisfied with their course, putting the School in 6th position nationally.

The School also has a reputation for innovation. Two of our academics, Dr Dan Lloyd and Dr Peter Klappa, have recently won National Teaching Fellowship Awards; Dr Lloyd for work on the School’s communication projects (see p21) and Dr Klappa for introducing novel ways of using IT in lectures, which enables the teaching to be captured and easily reviewed later. Dr Klappa has also developed new ways of providing individual feedback to students, and in collaboration with computer graphics experts, has developed high-quality animations to help explain difficult biological concepts that are available on YouTube.

Supportive community

Teaching methods include lectures, lab classes and work in small groups (via tutorials, workshops and problem-solving sessions). We also use some self-learning packages and many web-based resources. You gain extensive practical training and spend up to two days a week in the laboratory. In the final year, you conduct an eight-week research project which may be laboratory, library, communication, computing or business-based. These project types are designed to provide a range of skills for future careers and are closely aligned with the expertise of the academic staff.

A global outlook

According to the Times Higher education (THE), Kent is ranked in the top 10% of the world’s
universities for international outlook. Our School has an international reputation and collaborates with research groups throughout the UK, mainland Europe and beyond. You have the option to spend a year studying abroad (see p10). This year can be a fantastic opportunity for personal development and provides an added insight into your subject while experiencing a new cultural environment. We have an international community on campus, with 31% of academic staff coming from outside the UK and our students represent 148 nationalities.

A successful future
In your studies, you gain excellent analytical, communication and numerical skills. We have good links with employers such as the NHS, GlaxoSmithKline (GSK) and MedImmune, and can offer a research-based or non-research-based work placement, which gives you the opportunity to earn a salary for a year, evaluate a potential employer, and significantly enhance your employment prospects. See p8 for details.

Summer Vacation Studentships
We offer Summer Vacation Studentships, giving you the possibility of a paid eight-week research project in one of the School’s research labs during the summer vacation after your second year. Studentships are optional and do not contribute to your final degree result, but provide an ideal opportunity to experience the excitement of research first-hand and to gain valuable skills that will be useful when seeking employment or further study at the end of your degree. Alternatively, you could apply to join the International Genetically Engineered Machine (iGEM) project. This is an international competition for undergraduate students interested in synthetic biology (www.igem.org/about). In the last three years, our iGEM teams have won medals including gold in 2015 (see p20).

Our Summer Vacation Studentships are funded in part from money given to us by our alumni (The Stacey Fund) and all of our students are eligible to apply.

Professional accreditation
Our degrees are accredited by the Institute of Biomedical Science (www.ibms.org), the professional body for biomedical scientists. Gaining an accredited degree will allow you to work as a biomedical scientist in the NHS once you have satisfactorily completed your ‘on the job’ training portfolio and registered successfully with the Health and Care Professions Council (HCPC). Our Biomedical Science degrees are also accredited by the Royal Society of Biology (www.rsb.org.uk/students), the professional body for the life sciences. The advantage of having both accreditations is that you are best supported in whatever direction you choose to take your career. Our Biomedical Science with a Sandwich Year degree has been awarded Advanced Accreditation by the Royal Society of Biology in recognition of its extensive period of professional practice.
SUPERB STUDENT EXPERIENCE

Based on a scenic campus, you have the use of modern teaching labs, with state-of-the-art technology.

World-class study facilities
Our recently refurbished teaching laboratories ensure that you have an excellent environment in which to develop your practical skills. The School of Biosciences also attracts a large research budget, which allows us to provide an excellent research infrastructure. If you choose to do laboratory research as part of your final-year project (see p21), you will work alongside our internationally renowned research scientists, using the same high-level technology.

In 2013/14, over £2 million was spent upgrading the School. Other academic facilities on campus are also excellent, such as the newly extended Templeman Library, which provides a wealth of resources with extensive print and electronic collections specifically aimed at supporting the subject areas taught at Kent. It is well-equipped with hundreds of study spaces and PCs, loan laptops, wireless access and printing and copying facilities.

Thriving scientific community
Our school collaborates with research groups in industry and academia throughout the UK and mainland Europe. It has excellent links with local employers such as the NHS, GSK, MedImmune, Eli Lilly, Lonza, Aesica Pharmaceuticals, Sekisui Diagnostics, Cairn Research and Public Health England.

Kent Extra
Kent Extra is an excellent way to get more from your time at university. It provides opportunities to enhance your knowledge, learn new skills and improve your CV. You can do this in many ways, for example, by attending one of our summer schools; by volunteering; or by taking a Study Plus course in an area that interests you. For details, see www.kent.ac.uk/kentextra

Beautiful green campus
Our campus has plenty of green and tranquil spaces, both lawns and wooded areas, and is set on a hill with a view of the city and Canterbury Cathedral. For entertainment, the campus has its own cinema, theatre, concert hall and student nightclub. It has a reputation for being a very friendly university with a cosmopolitan environment. There are many restaurants, cafés and bars on campus and there’s also a sports centre and gym.

Everything you need on campus is within walking distance, including a general store, a bookshop, banks, a medical centre and a pharmacy. From campus, it’s a 25-minute walk or a short bus-ride into Canterbury.

Attractive location
Canterbury is a lovely city with medieval buildings, lively bars and atmospheric pubs, as well as a wide range of shops. The attractive coastal town of Whitstable is close by and there are sandy beaches further along the coast. London is under an hour away by high-speed train.
Katie Wilson is in her final year, studying for a degree in Biomedical Science with a Sandwich Year.

Why did you choose Kent?
I really loved the location; it's beautiful and I really liked the fact that everything is available on campus. I wanted to do a Sandwich Year – I didn't want to move too far away from home – but I wanted to get experience for a job in the future.

How is the course going?
It's going really well. Biomedical Science is something I'm really passionate about. There aren't actually any modules this year that I don't like. I lean more towards the physiology side of the course, rather than microbiology and virology. I've always been a science enthusiast. All of my A levels were science based – it's always come naturally to me.

How would you describe your lecturers and what about the level of support?
The majority of my lecturers are extremely passionate and approachable. I've gone to a lot of them this year, mainly as a result of doing the sandwich year – it's increased my confidence to ask questions. If you can't make sense of data or an assignment appears confusing, you can ask for help; the support is there if you need it.

Which modules have you enjoyed the most, and why?
I really enjoyed Skills for Bioscientists, in the first year. My A levels were Biology, Chemistry, Physics and Maths, so it was like a revision module; it got everyone on to the same place, and the lecturer really brings it to life. I also love the physiology lectures; I've always been interested in anatomy and how things work.

How would you describe your fellow students?
In the beginning I was quite shy; I had maybe two to three good course friends who were really helpful, but I have more now, mainly because those of us who have come back from the sandwich year have stuck together. We are all working really hard. Everyone's friendly, even in group-work with people you don't know that well, we are all striving for the same goal.

Where did you spend your sandwich year?
I worked at Proctor & Gamble in a team called Personal Healthcare. My role involved taking supplement products and creating a scientific communication for the product launch. They were launching a multi-vitamin supplement brand called Swisse, which has just become available in the UK. It is the No 1 Australian supplement brand and Nicole Kidman, the actress, endorses it in a television advertising campaign. I worked on three in particular: the immune supplement, krill oil, an omega 3 oil, and fish oils. I ended up as the krill oil specialist in the company; it's ridiculous how much I know about krill oil! I created scientific communication pieces and had to understand how the immune system works and how the product would work in the body. The placement cemented what I want to do. It's the science I enjoy, so scientific communication is something I want to go into. The sandwich year is all about experience – I would not have had any idea that science communication existed – that's where it excels; it shows you what is out there.

What kind of career do you hope to follow when you leave, and why?
I definitely want to work in science communication. I used to want to be a teacher and I see it as a way of relaying science in a way that is easily understandable for other people. There are so many different areas you can go into. Having the experience of the sandwich year should help me to stand out from the crowd when it comes to getting a job because of that experience.

Any advice to somebody thinking of coming to Kent?
Join a society. You do need a break from your course and having a night out doing other things outside of work is a good way to make friends. The jump from first to second year is quite big, so up your game. You need to really focus and work harder. I've had a really good three years here; it will be sad to finish.
A SUCCESSFUL FUTURE

Many career paths can benefit from the analytical, communication and numerical skills you develop during your studies. Most of our students are highly successful after graduation.

As well as providing a first-rate academic experience, we want you to be in a good position to face the demands of a tough economic environment. More than 95% of Kent students who graduated in 2015 were in work or further study within six months. We pride ourselves on helping you develop transferable skills through your studies.

Common career paths
About 30% of our graduates go straight into scientific jobs that are either laboratory-based in hospital or industrial labs, or non-laboratory based. Typical laboratory-based jobs include biomedical science, medical microbiology, clinical chemistry, transfusion science, haematology, histopathology, cytology, virology and immunology, whereas non-laboratory based work includes scientific writing, clinical trials, scientific sales and support, and science communication.

Some 40% of our graduates go on to take a higher degree to become senior research scientists – a role that allows them to steer and manage scientific exploration. The most common route is to gain an MSc in a more specialised area or a PhD by joining an established research group for three or four years. We offer taught MSc courses including Biotechnology and Bioengineering, Cancer Biology, Drug Design, Infectious Diseases, Reproductive Medicine, and Science Communication that are available to you after graduation, as well as MSc and PhD programmes by research. A number of students each year train to join the teaching profession and a good degree can qualify you for graduate-entry medicine.

The remaining 30% of graduates go on to work in non-scientific areas. The skills you gain in your studies are in high demand in a range of careers. Our students have found employment in publishing, sales, marketing, recruitment, banking, accountancy, police and social work.

Professional experience
Students who choose to take a Sandwich Year/Professional Year (see p16) often find this extra experience enhances their job prospects. They gain experience, insight into the professional pathways available and useful skills. A year abroad can also provide valuable experience and an additional opportunity for personal development. See p10 for details.

Many of our students develop professional skills and gain hands-on experience through a wide range of voluntary work opportunities (see www.kent.ac.uk/employability). We also offer Summer Vacation Studentships, paid positions in the School available during the summer after your second year (see p3).

Careers advice
Kent’s award-winning Careers and Employability Service offers guidance on how to apply for jobs; write a good CV; perform well in interviews and aptitude tests. It also provides information on graduate opportunities, before and after you graduate. See www.kent.ac.uk/employability
**Bal Sandher graduated from Kent in 2007 with a BSc in Biomedical Science. He is now managing director of Hectic Lifestyles Limited, a nutritional and sports supplements manufacturer.**

**What attracted you to Kent?**
I fell in love with the campus on an open day. It had a remarkable view of Canterbury and gave me a positive impression. I left feeling this was where I wanted to spend the next three years of my life.

**How did you find the course?**
In a word, challenging. I never expected that a degree in Biomedical Science was going to be easy. After the initial shock at the sheer volume of learning required, it was easy to get into a rhythm and things started to click into place.

**Did the course live up to your expectations?**
It was a lot more enjoyable than I imagined. The first year was intense, but well-structured and gave a good introduction to Biomedical Science. In the second and third years, things became more specialised with more choices based on our own influences. My final-year project was structured around the Cryogenic freezing of humans, which was very interesting.

**What part of the course most interested you?**
The more hands-on parts of the course, the labs, the practicals, were the most enjoyable for me. I enjoyed my final-year dissertation; it was great to be able to use three years of learning and knowledge, culminating in one final piece of hard work.

**What about your lecturers?**
The lecturers were enthusiastic and knowledgeable, and made learning a difficult subject easy. We had some real characters in the School of Biosciences; it was never dull.

**What was the level of support like in your studies?**
I appreciated the fact we were assigned a tutor on day one. I felt his door was always open if I was struggling. Biosciences was a close-knit environment, but also a nurturing one, providing a good balance between support and pushing us out of our comfort zones.

**How did you find university life in general?**
I loved my time at university and made many lifelong friends. The social aspects were a big part of university life, which helped take the edge off the stresses of the final year of studying, as everybody seemed to be in the same boat.
I have many good memories.

**How did Kent help you with your career plans?**
Having a degree helped immensely with interviews and, with the alumni network, it never felt like the door was closed. It was good to have that safety net in place. I sought advice several times after graduation, and found the process straightforward and useful.

**What are you doing at the moment?**
I am Managing Director of a multimillion pound supplement manufacturing company. We have grown from virtually nothing to where we are today in seven years. For any budding entrepreneurs out there, the University of Kent is the perfect place to realise your potential. I am also a member of the Kent Advancement Committee, a campus-wide scheme to help students achieve success in business. There is no other scheme like it in the UK. It provides students with free, impartial advice from successful business professionals, as well as the support to spur your concepts into fully fledged and viable businesses.

**How do you see your career progressing?**
The dream was to be semi-retired by 35. Whether that’s still reality, I don’t know, but as a business we keep growing and innovating, and it’s hard to walk away from that.

**What would you say to someone thinking of studying at Kent?**
University tends to be when you grow up from being a naive teenager into a fully-fledged adult. There’s no better place to do this than at Kent.
Choosing your programme

Not sure which programme to choose? Here’s a quick guide to the degrees on offer within the School of Biosciences.

Biomedical Science

This three-year programme explores the biochemical processes that occur in the human body, and how they change in diseases such as cancer and infection, and how these diseases can be identified and treated. It offers its graduates a chance to put scientific knowledge into practical use within medical healthcare, in laboratory-based fields within the NHS, the pharmaceutical industry or medical research.

The degree is accredited by the Institute of Biomedical Science (www.ibms.org) and the Royal Society of Biology (www.rsb.org.uk) so that you are best supported in whatever career you decide to take.

Biomedical Science with a Sandwich Year

The degree may be taken as a four-year programme with a paid work placement in a research-based activity between your second and final years. The sandwich placement can be in the UK or abroad. You can apply for this programme directly, or you can choose to transfer into it during Stage 2 if you have a good level of achievement in your first year (an overall average of 65% is required; see p16 for more details on eligibility).

Biomedical Science with a Professional Year

There are an increasing number of opportunities for students to acquire professional training in non-research areas (such as management, scientific writing, etc). This four-year programme allows you to spend a year away from the University between your second and final year to take full advantage of such an opportunity. This programme does not have a separate UCAS code, but you can transfer into it (if a suitable placement is found) during your second year (Stage 2). The eligibility criteria are identical to the Sandwich Year option (see p16 for details).

Biomedical Science with a Year Abroad

This four-year programme allows you to spend a year abroad between the second and final year of your degree – giving you a fantastic opportunity to immerse yourself in another culture. This programme is available to students who achieve an overall average of 65% at Stage 1, or you can apply for this option directly (see p16 and p23).

All our year abroad exchanges are with universities where the teaching is in English, so you do not need a foreign language qualification to take this option. Currently, we have exchanges with 16 universities including eight in North America, four in Canada, two in Europe (Amsterdam and Istanbul) and one each in Hong Kong and Malaysia. See www.kent.ac.uk/goabroad/opportunities/az.html for an up-to-date and complete listing.

The subjects you study during your year abroad will complement your programme at Kent and the extra year allows you to study a wider range of topics than is possible on a three-year degree programme.

DID YOU KNOW?

Kent is a leading university and is ranked 23 in the UK in The Times Good University Guide 2016.
Other degree programmes

The following degrees are also available within the School of Biosciences, each with options to study abroad or take a Sandwich/Professional Year.

Biology

Biology is the study of living organisms and their interactions with the environment. You investigate a wide variety of life forms ranging from viruses and bacteria to complex animals and plants. The degree provides a broad survey of the various biological disciplines, but with a focus on modern molecular techniques. It includes cell and molecular biology, evolution, genetics, infection and immunity, microbiology, anthropology, conservation and the physiology of animals and plants. Our Biology degrees are accredited by the Royal Society of Biology.

Biochemistry

Biochemistry deals with the way living organisms function at the molecular level. How do living organisms work? How are they built, controlled, repaired and supplied with energy? Biochemistry is an ideal degree if you want to enter a research career in a life sciences area. Our Biochemistry degrees are accredited by the Royal Society of Biology.

Bioengineering

This is a cross-disciplinary course between the Schools of Biosciences and Engineering and Digital Arts. The programme is designed to train the next generation of engineers who will be required to build increasingly complex and integrated systems for medical and industrial use. Approximately 30% of the programme is provided by the School of Biosciences.

International students

If you are applying from outside the UK and without the necessary English language qualifications for direct Stage 1 entry, you may be able to take the Kent International Foundation Programme. You will need strong results in your national school-leaving qualifications in biology (and preferably chemistry) which will be assessed on an individual basis. For more details, see www.kent.ac.uk/ifp

Need more information?

For Biology, Biochemistry or Bioengineering, see www.kent.ac.uk/ug or download a leaflet at www.kent.ac.uk/studying/leaflets
Stage 1 is the first year of your degree programme. Your modules provide a broad survey of the various biological disciplines and include aspects of human health and disease.

Teaching is via lectures, supervisions, tutorials and laboratory classes.

Most Stage 1 modules are assessed by 50% coursework and 50% exam. At Stage 1, you need to reach a satisfactory standard to proceed to Stage 2; however, no Stage 1 marks are carried forward to your final degree result.

Please note that the module list below is not fixed as new modules are always in development and choices are updated yearly. Please see www.kent.ac.uk/ug for the most up-to-date information.

There are seven compulsory modules:
- Biological Chemistry B (double module)
- Enzymes and Introduction to Metabolism
- Genetics and Evolution
- Human Physiology and Disease 1
- Introduction to Biochemistry
- Molecular and Cellular Biology 1
- Skills for Bioscientists.

Modules: Stage 1

Biological Chemistry B
The principles of chemistry are an essential foundation for biomedical science. Building up from the atomic level, this module introduces periodicity, functional groups, compounds and chemical bonding, molecular forces, molecular shape and isomerism, chemical reactions and equilibria, enabling you to understand organic chemistry in a biological context.

Enzymes and Introduction to Metabolism
This introduces you to metabolic pathways and the control of metabolism by changes in enzyme activity. The module covers the rates of biological processes and the theoretical principles underlying them, the basic structure and function of enzymes and their kinetics. You perform enzyme assays to determine their kinetic properties and study the key pathways of metabolism in animals and their control mechanisms.

Genetics and Evolution
This module explores the historical views on evolution, the action of DNA, population genetics and speciation. You gain an understanding of Mendelian inheritance and the ability to predict the outcomes of mono- and dihybrid crossbreeding, as well as an insight into Darwin’s observations on the role of genetics in evolution.

Human Physiology and Disease 1
Here, you consider the anatomy and function of normal tissues, organs and systems, and their diseases. You look at the manifestation of the various conditions at the level of cells, tissues and the whole patient, and discuss diagnosis, prognostic indicators and treatments.

Introduction to Biochemistry
This introduces you to biomolecules in living matter. It contrasts the simplicity of the basic building blocks of macromolecules (amino acids, sugars, fatty acids and nucleotides) with the enormous variety and adaptability of the different macromolecules they form (proteins, carbohydrates, lipids and nucleic acids). It highlights the nature of the molecular structure of the macromolecules and their interactions within the cellular environment.

Molecular and Cellular Biology 1
You are introduced to the key themes and experimental techniques in molecular biology, genetics and eukaryotic cell biology. The module covers basic cell structure, the principles of the cell cycle and cell division, the control of living processes by genetic mechanisms, and techniques for genetic manipulation such as gene cloning.

Skills for Bioscientists
You become familiar with laboratory-based practical skills, the analysis and presentation of biological data, basic mathematical, statistical and communication skills, note-taking and essay writing.
STUDYING AT STAGE 2

Stage 2 is the second year of your degree programme and your marks contribute towards the final grade of your degree. The modules during this stage become more specialised, focusing on such topics as infectious disease, genetics, immunology, physiology and pharmacology.

Please note that the modules listed below are not fixed as new modules are always in development and choices are updated yearly. Please see www.kent.ac.uk/ug for the most up-to-date information.

You take the following compulsory modules:
• Human Physiology and Disease 2
• Infection and Immunity

• Investigation of Disease
• Metabolism and Metabolic Disease
• Microbial Physiology and Genetics 1
• Pharmacology
• Skills for Bioscientists 2.

And choose one option from:
• Cell Biology
• Gene Expression and its Control
• Metabolism and Metabolic Regulation.

Modules: Stage 2

Human Physiology and Disease 2
This module builds on Human Physiology and Disease 1 and covers in detail the remaining physiological systems of the body, namely reproductive, muscular, nervous and endocrine, and associated disorders including infertility, cardiomyopathies, and neurodegenerative diseases such as Alzheimer’s and Parkinson’s disease.

Infection and Immunity
This module provides you with an understanding of the major diseases of infectious origin that colonise human body tissues. It covers the principles of epidemiology, and looks at medically important diseases such as the HIV virus and AIDS. The features and functions of immune cells and molecules used in the defence of the body against invading microorganisms are studied.

Investigation of Disease
You are introduced to clinical biochemistry and screening for metabolic disease, and cellular pathology and screening for malignant disease; two of the main branches of laboratory medicine through a study of human disease and their investigation within a clinical setting. Exposure to professional biomedical scientists working within the different disciplines, and to the unique NHS environment, also supports you in making career choices for the future.

Metabolism and Metabolic Disease
In this module you discover how errors in metabolic processes result in the development of human diseases such as phenylketonuria, gout, hypercholesterolaemia, diabetes and porphyrias.

CONTINUED OVERLEAF
Microbial Physiology and Genetics 1
This module includes a review of the structure and biosynthesis of bacterial and fungal cells, their key metabolic processes and their quest for food. You also study microbial growth, genome organisation and structure, and mechanisms of DNA transfer.

Pharmacology
This module introduces you to the major concepts underpinning pharmacology – the study of drugs and their actions in cells, tissues and whole animals. You learn to describe the effects of drugs in cells and to relate the mechanism of drug action to their therapeutic intervention in disease.

Skills for Bioscientists 2
In this module, you further develop key skills in undertaking and communicating science. Focused around ‘mini-project’ work, you are introduced to new techniques and also how to plan and design your own experiments for a short six-day project. You present your work through an oral presentation and a project report. You develop skills in essay writing, report writing and in addition, there are presentations on careers to help you start thinking about future career options.

Cell Biology
This module reviews the experimental approaches used to investigate the biology of the cell and highlights the similarities and differences between cells of complex multicellular organisms and microbial cells. Initially, you consider the functions of the cytoskeleton and cellular compartments such as the nucleus. Later in the module, you examine the mechanisms by which newly synthesised proteins are secreted or shuttled to their appropriate cellular compartments.

Gene Expression and its Control
This module deals with the molecular mechanisms of gene expression and its regulation in prokaryotes and eukaryotes. This involves descriptions of how genetic information flows from DNA to RNA to protein, how this flow is controlled in specific tissues and cells throughout development and how it is disrupted in cancer cells.

Metabolism and Metabolic Regulation
This module describes the integration of the many chemical reactions underpinning the function of cells, for example, how cells make ATP and use it to drive cellular activities, and how plant cells harvest energy from the sun in the process of photosynthesis.
THE SANDWICH YEAR/PROFESSIONAL YEAR

If you choose to do work experience, it comes between Stages 2 and 3. Placements can either be research-based (Sandwich Year), or non-research-based (Professional Year) if training in other graduate-level skills (eg. management) are offered during the year. Currently the Professional Year does not have a separate UCAS code, but you can transfer into this programme during Stage 2 if an appropriate placement is found.

Excellent links with employers

In the past, our students have taken Sandwich Year placements with employers such as the NHS, GlaxoSmithKline (GSK), Lonza, MedImmune, AstraZeneca and Eli Lilly and Professional Year placements have been with the NHS, De Puy Synthes, Defence Science and Technology Laboratory (DSTL) and Abcam. The School has established excellent links with these employers, as well as many others.

Finding a placement

Work placements are usually advertised on the company’s website and you apply by sending in a CV or application form. We guide you through the process, giving you advice and feedback on how to write a winning CV, and practice/guidance on how to be successful at interview.

Salary and benefits

Students usually work on placement for the entire calendar year. Salary and holiday entitlements vary according to the employer you work for. However, most students find that they earn enough to avoid having to access their student loan during the year away, and some earn enough to be able to save some of their income.

Study and career benefits

A research-based work placement provides practical experience that can be put to good use in your final year of study. It gives you a sense of how the theory works in practice and improves your skills in many areas. Both research and non-research placements allow you to evaluate a particular career path and gain knowledge of the working environment.

In general, work experience is very popular with employers, because of the skills you gain in the workplace. If your placement is a success, you may even be offered a job with the same employer after graduation.

Keeping in touch with Kent

Your academic adviser maintains close contact with you during your year away from the University, checking on your progress and paying a visit to your workplace. All placement students come back to the School for a day halfway through the year to talk about their work with other students and staff. At the end of a Sandwich Year, your work is assessed by a presentation and written report, and these contribute 10% to your overall degree mark. A Professional Year does not contribute to your final degree mark and instead is assessed on a pass/fail basis.

Eligibility for the Sandwich Year/Professional Year

A work placement is an option for all students who achieve 65% or more as an overall average in Stage 1 (typically 60% of the year group). If you take this option, you transfer in Stage 2 once a placement is found. If you apply directly for the Biomedical Science with a Sandwich Year degree and meet the requirements of the offer made, then the 65% threshold does not apply. However, if you do not qualify via the entry requirements and we offer you a discretionary place, the 65% threshold will apply so that we can treat all our students fairly. The same criteria apply for entry into the Year Abroad programme.

“I decided to take a sandwich year and work in a lab; I would encourage people to do a placement because it gives you experience, not only in the field, but as a person. I have no doubt that my placement will enhance my employability after I graduate.”

Lina Mikaliunaite
Biomedical Science with a Sandwich Year
STUDENT PROFILE

Sofia D’Abrantes is in her final year, studying Biomedical Science with a Sandwich Year.

Why did you choose Kent?
The course is accredited by the Institute of Biomedical Science, which is really important. I knew from looking at the University website that there was a final-year project and lots of practical work in the first and second year as well. All the academics are doing active research, which means they are up-to-date with what’s happening.

How is the course going?
It’s going really well. Last year was an eye-opener for me, I did a placement and it has definitely helped me this year. If I hadn’t taken the year out, I don’t think I’d be doing as well now. It’s a lot of work to get a placement, but it’s so worth it. Now I am in my final year I have labs three times a week from 9am to 5pm.

Where did you spend your sandwich year?
I worked at the Science and Technology Facilities Council (STFC) in Oxford, one of the seven research councils in the UK. I really enjoyed the experience; it has the latest microscopes and cutting-edge research is done there. I worked with leading experts in the field and learned so many new techniques. I was given a lot of responsibility from day one. I had my own project, and also helped users of the facility.

When people wanted to use the equipment, they would tell me what their goal was and what they needed to achieve. With my supervisor, I helped them set up a plan for the week and helped them to use the equipment.

How do you think it will help in your future career?
The placement taught me a good work ethic because at university you don’t have the boundaries of a nine to five job, so you need to be able to manage your time well. It has given me confidence and helped me with my final-year project. If I didn’t have this experience, I wouldn’t have known that I wanted to do a PhD.

What kind of career do you want to follow when you leave?
With a degree in Biomedical Science you can go into so many different careers. My goal is to make a difference to people’s lives. If you can help someone by using scientific research, such as making vaccines, it’s really rewarding.

What do you think of the facilities on campus?
They are very good, particularly in biosciences. For my final-year project I am using a single molecule microscope – it’s probably one of the best in the world; it has a camera that came out about a month ago. Kent is a cutting-edge research facility. The library has been completely upgraded and is amazing. The campus is great. When you visit other universities you realise how lucky you are to be here.

Have you used the award-winning Careers and Employability Service?
Yes. I used it mainly to find a placement. They send out emails about work opportunities. I love the weekly updates, they are really useful. They also helped me with my CV and even suggested some formatting changes, little things you don’t really think about.

Any advice for prospective students?
Take as many opportunities as you can. I volunteered in my first year and in my second year I was a mentor to first year students. Anyone can do well in a degree but not everyone does the little things... and it’s the little things that make it great. Get involved, join a society, become part of a committee. There are over 200 societies to choose from. I also work at the Students’ Union. It’s a really rewarding experience to go to university, and the more you put in the more you will get out.
STUDYING AT STAGE 3

Stage 3 is the final year of your degree. One of your compulsory modules is a research project, which counts for a quarter of your final-year marks.

Please note that the module lists below are not fixed as new modules are always in development and choices are updated yearly. Please see www.kent.ac.uk/ug for the most up-to-date information.

You take the following compulsory modules:
• Advanced Immunology
• Haematology and Blood Transfusion
• Pathogens and Pathogenicity
• Research Project (double module, see p21).

You also choose three options from:
• Bioinformatics and Genomics
• Biology of Ageing
• Biological Membranes
• Cancer Biology
• Cell Signalling
• Frontiers in Oncology
• Integrated Endocrinology and Metabolism
• Microbial Physiology and Genetics 2
• Neuroscience
• New Enterprise Startup
• Virology.

Modules: Stage 3

Advanced Immunology
Since the discovery of HIV, much progress has been made in our understanding of how the immune system functions. Here, we review topical aspects of this subject, with an emphasis on the regulation of the immune response, and the role of dysfunctional immune systems in a variety of disease states.

Haematology and Blood Transfusion
This module describes the anatomy, physiology, pathology and therapy of the blood and blood forming tissues, including the bone marrow. It covers a wide range of disorders including haematological malignancies, infection with blood-borne parasites that cause malaria, and inappropriate clotting activities.

Pathogens and Pathogenicity
Here, you cover the molecular basis for microbial pathogenesis in relation to bacterial, viral and fungal pathogens, focusing on human infections. Topics covered in detail include host-pathogen interactions, therapeutic strategies, vaccination and the role of viruses in the development of cancer.

Research Project
You work independently on a research project, but have regular meetings with a supervisor who guides you through the process and provides advice and support. Your supervisor will be an academic whose research interests are related to your topic. See p21 for more details.

Bioinformatics and Genomics
The past decade has seen a massive increase in protein structure and genome sequence information. In this module, you investigate how modelling can be used to predict protein function and how genetic variants identified in the
Biology of Ageing
This module reviews the importance of studying ageing, and the organisms and methods used to do so. It considers how organisms age, and provides a detailed understanding of the processes and molecular mechanisms that govern ageing.

Biological Membranes
Cells and subcellular compartments are separated from the external milieu by lipid membranes with protein molecules inserted into the lipid layer. The structure and function of these two components are diverse, ranging from regulatory functions to maintaining the structure of the cell.

Cancer Biology
In this module, you explore the molecular basis of cancer and assess how this knowledge may be used to develop new therapeutic strategies to tackle the disease in its variety of forms. Topics include: the regulation of gene expression, the role of growth factor signalling, cancer stem cells, cell apoptosis, chemo-resistance, cell metastasis, tumour immunology, and targeted cancer therapies and clinical trial design.

Cell Signalling
This module explores the diverse mechanisms used by cells to communicate. It covers a range of signalling molecules, including hormones and growth factors, the receptors upon which they act and the associated intracellular signalling pathways that lead to a cellular response.

Frontiers in Oncology
This module introduces the basic principles of cancer biology and cancer therapy. It explains the characteristics of cancer and why the development of more effective anti-cancer therapies is so extremely challenging. The module includes interactive discussions on a number of recent scientific publications that highlight the important issues in cancer research today.

Integrated Endocrinology and Metabolism
This module focuses on the endocrine system, one of the two great control systems of the body. In conjunction with the nervous system, these two regulatory systems monitor changes in an animal’s internal and external environments and direct the body to make any necessary adjustments to its activities so that it adapts itself to these environmental changes.

Microbial Physiology and Genetics 2
This advanced module focuses on how physiological homeostasis is maintained in the bacterial cell in response to environmental stresses. It explores the current experimental approaches used to study this area, the variety of different ways that gene expression is controlled and microbial biodiversity.

Neuroscience
This module looks at the molecular and cellular basis of the development of the nervous system from a simple sheet of neuro-epithelial cells and investigates the molecules and mechanisms involved in the transmission of signals between nerve cells. You also explore how the nervous system controls a variety of behaviours such as learning, memory, sleep and dreaming.

New Enterprise Startup
You look at the characteristics required for a business to succeed and the reasons for business failure. It covers business risks and uncertainties, skills required for business ownership, and sources of advice and support for businesses.

Virology
Here, you survey the full replication cycle of a broad range of viral families, including newly emerging infectious diseases. The module includes interactive discussions on recent scientific publications that highlight the relevant and important issues in the field of virology today.
Students from the School of Biosciences were part of a team that was awarded a gold medal in the International Genetically Engineered Machine (iGEM) Giant Jamboree in Boston in 2015. Here, some of the team talk about their project and explain what they gained from the experience.

A team of students from the Schools of Biosciences, Physical Sciences and Engineering and Digital Arts, developed and presented a research project to iGEM, a world-wide synthetic biology competition, which encourages students to develop and test innovative solutions to global problems.

The Kent project, called Envirowire, investigated the feasibility of generating functional amyloid nanowires, under the guidance of Dr Wei-Feng Xue and other academic and research staff within the School of Biosciences. Nano-wires formed from proteins made by bacteria provide a potential solution in the fabrication of biologically and clinically-applied circuitry, with benefits including miniaturisation, improved efficiency, biocompatibility and use of renewable sources of energy and materials.

The team competed against 280 teams from around the world, including Cambridge, Cornell, Heidelberg, Tokyo and Sydney.

What did your project entail?
Katarina Pisani: We had to pick something that was feasible in the timescale. We used E.coli, a type of bacteria which is commonly used in labs for experiments and engineered it to produce nano-wires from an amyloid protein. We used the bacteria to produce circuits.

What are the benefits of using bacteria?
Alice Tomlinson: Nano-circuit boards usually use silver or copper nano-wires, but if you make a nano-wire from a protein, you eliminate the need for mining, which is bad for the environment. Copper, silver and gold are finite resources. E.coli can be grown in large quantities, so it’s more sustainable and can be made smaller and modified in many ways.

How would you describe the experience of competing in iGEM?
Suparna Thakali: our supervisor said iGEM is like a crash course in science, so if you want to go on to do a Master’s or a PhD, it’s like a mini research project. We were exposed to cutting-edge technology from hearing what techniques the other teams used.
Katarina: it was nice at this stage of our study to realise the variety and freedom you have as a bioscientist; it gives you ideas about what you can do and makes you really excited about your studies.
Alice: it’s hard to describe, but when you’re there and everyone is so hyped about their project, everyone’s buzzing.
In your final year (Stage 3), you complete the eight-week Research Project. You choose a project that interests you from a wide range of options.

There are three types of project on offer – a laboratory-based project (including bioinformatics-based projects), a literature and data analysis project (including business projects), or a communication project.

If you choose a laboratory-based research project, you will often meet and work with other members of your supervisor’s research team and use the equipment and facilities within the team’s research lab.

Currently, our research areas include: cancer biology and cancer therapies, bioprocessing and the development of novel therapeutics, genetic and prion diseases, parasitology, reproductive medicine, synthetic biology, protein folding and structural biology, the biology of ageing, molecular motors, bacterial and viral pathogenesis and sensing.

**Laboratory-based project**

Laboratory projects are offered in all of the research areas of the School and involve techniques such as cell culture, gene cloning, Polymerase Chain Reaction (PCR), microscopy, electrophoresis, spectroscopy, recombinant protein expression, assay development, and so on. You carry out real research of interest to your supervisor and their research group. You have the possibility of seeing or discovering something for the very first time and your work may even be published in the scientific literature.

Example project titles include:
- Genome organisation in sperm nuclei using a novel analysis system
- Engineering mammalian cells to produce larger yields of recombinant therapeutic protein ‘bio-drugs’ more efficiently and at lower cost
- The role of the cytoskeletal protein talin in promoting and regulating cell migration
- Novel single-chain antibodies for the treatment of cancer

**Literature and data analysis project**

A literature and data analysis project gives you the opportunity to dig deep into the scientific literature to fully understand an area of research including the analysis of published (or in some cases unpublished) data. The topic will be one that is of interest to your supervisor, who will initially direct you to exciting papers and discuss your findings and ideas with you on a regular basis.

Recent projects include:
- What do telomeres have to do with ageing and disease?
- Mitochondria as therapeutic targets to extend lifespan
- Does influenza virus morphology reflect adaptation to growth in human hosts?

- Is acquired resistance to chemotherapy the main hurdle in our battle to treat cancer?

In a Business Project, the objective is to produce a five-year business plan for a proposed biotechnology company. Here you will work with a real scientific idea and think about how it could be commercially exploited.

**Communication project**

One of the key challenges facing scientists is to make their work interesting, accessible and relevant to the public. A communication project can develop these key skills and broaden your employment opportunities.

Communication projects are offered in a wide range of topics, or you can suggest your own. The topic will be a poorly understood or controversial area of bioscience and you not only research the topic and write an up-to-date science report, but also think about how you can explain your findings to a non-scientific audience. You put this into practice by giving a presentation in a secondary school and by preparing a website or a written article for a newspaper or magazine.

Recent projects include:
- Sleep – a waste of time or an essential behaviour?
- Beyond genetics: how epigenetics controls your life
- Are sugary beverages a threat to global health?
- Are testes the only difference between males and females?
VISIT THE UNIVERSITY

Come along for an Open Day or an Applicant Day and see for yourself what it is like to be a student at Kent.

Open Days
Kent runs Open Days during the summer and autumn. These provide an excellent opportunity for you to discover what it is like to live and study at the University. You can meet academic staff and current students, find out about our courses and attend subject displays, workshops and informal lectures. We also offer tours around the campus to view our sports facilities, the library, and University accommodation. For further information and details of how to book your place, see www.kent.ac.uk/opendays

Applicant Days
If you apply to study at Kent and we offer you a place, you will usually be sent an invitation to one of our Applicant Days. You can book to attend through your online Kent Applicant Portal. The Applicant Day includes a presentation about the School and our degree programmes, a ‘taster’ lecture given by a member of academic staff on their research area, guided tours of the campus and University accommodation, and the opportunity to speak with both academic staff and current students about your chosen subject. For further information, see www.kent.ac.uk/visit

Informal visits
You are also welcome to make an informal visit to our campuses at any time. The University runs tours of the Canterbury and Medway campuses throughout the year for anyone who is unable to attend an Open Day or Applicant Day. It may also be possible to arrange meetings with academic staff, although we cannot guarantee this. For more details and to book your place, see www.kent.ac.uk/informal

Alternatively, we can provide you with a self-guided tour leaflet, which includes the main points of interest. For more details and to download a self-guided tour, go to www.kent.ac.uk/informal

Scholarships and bursaries
For details of scholarships and bursaries at Kent, please see www.kent.ac.uk/ugfunding

On the web
For the latest School information on studying Biomedical Science at Kent, please see www.kent.ac.uk/bio

More information
If you would like more information on Kent’s courses, facilities or services, or would like to order another subject leaflet, please contact us.

T: +44 (0)1227 827272
Freephone (UK only): 0800 975 3777
www.kent.ac.uk/ug
Location
Canterbury

Award
BSc (Hons)

Programme type
Full-time

Degree programme
Single honours (three years)
• Biomedical Science (B940)

Single honours (four years)
• Biomedical Science with a Sandwich Year (B942)
• Biomedical Science with a Year Abroad (B943)

Offer levels
Biomedical Science (B940): BBB- ABB at A level including Biology with practical endorsement (from 2017); GCSE Mathematics grade C. IB Diploma 34 points (or 15 points at HL) including Biology at HL5 or SL6 and Mathematics at HL4 or SL4.

Biomedical Science with a Sandwich Year/Year Abroad (B942/B943): ABB at A level including Biology with practical endorsement (from 2017); GCSE Mathematics grade C. IB Diploma 34 points (or 16 at HL) including Biology HL5 or SL6, Mathematics at HL4 or SL4.

Sandwich Year/Professional Year
You have the opportunity to undertake a one-year work placement away from the University between Stages 2 and 3. See p16 for details.

Year Abroad
You have the opportunity of spending a year studying abroad between Stages 2 and 3. See p16 for details.

Transfer between three and four-year programmes
You can transfer to a four-year programme during Stage 2 if you achieve 65% or more as an overall average in Stage 1 (see p10).

International Foundation Year
Applicants from outside the UK and without the necessary English language qualifications may be able to take the Kent International Foundation Programme (IFP). See p11 for details.

Progression requirements for Sandwich Year and Year Abroad applicants
If you miss the offer requirements for a four-year course but subsequently accept a discretionary place, you will be required to achieve 65% or more in Stage 1 to apply for Sandwich/Professional or Year Abroad opportunities. If 65% in Stage 1 is not achieved, you transfer on to the three-year programme at the start of Stage 2.

Professional recognition
All of our Biomedical Science programmes are accredited by the Institute of Biomedical Science (IBMS) and the Royal Society of Biology (RSB). Biomedical Science with a Sandwich Year (B942) has Advanced Accreditation recognising its extensive period of professional practice.

Offer levels and entry requirements are subject to change. For the latest information, see www.kent.ac.uk/ug
COME AND VISIT US

To find out more about visiting the University, see our website:
www.kent.ac.uk/visit