ACADEMIC EXCELLENCE AND INSPIRATIONAL TEACHING

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.

Bioengineering is an exciting and rapidly developing subject which draws on engineering technologies and applies them to medical and biological problems. It has led to many scientific breakthroughs – everything from the use of stem cells to create an artificial windpipe to robotic skeletons that can help disabled people to walk.

Studying Bioengineering at Kent gives you a great opportunity to work at the cutting edge of this technology. The degree draws on the School of Engineering and Digital Arts’ experience in developing medical-electronic systems and the research expertise within the School of Biosciences.

World-leading research
The School of Engineering and Digital Arts (EDA) is actively engaged in research, winning funding from UK research councils, European research programmes and government agencies. In the Research Excellence Framework (REF) 2014, 98% of Kent’s research in engineering was judged to be of international quality. The School of Biosciences at Kent is among the most research active in the UK. In the REF 2014, biological sciences at Kent was ranked 7th in the UK for research intensity.

Inspirational teaching
Spectacular advances in this field have made a huge impact on our lives. We base our teaching on leading-edge research topics, which is vital in a field that advances so quickly. The Schools employ lecturers with a range of research, teaching, industry and healthcare experience, and we also employ visiting lecturers to provide a more specialist view.

A global outlook
Kent has a reputation as the UK’s European university and has developed international partnerships with a number of prestigious institutions. We have an international community on campus with 37% of Kent’s academics coming from outside the UK and students representing 148 different nationalities. Kent is ranked in the top 10% of the world’s universities for international outlook according to the Times Higher Education (THE).

*of 122 universities, not including specialist institutions
Professional recognition

The Institution of Engineering and Technology (IET) provides accreditation for other degrees offered within the School of Engineering and Digital Arts (see p10). We are applying for accreditation for our new degree in Bioengineering to bring it in line with our other programmes and provide professional recognition for those who wish to work as an engineer.

A year in industry

Your degree can incorporate an additional year spent in industry. The placement year occurs between the second and third years of study and is suitable for anyone who wants to experience life in a commercial environment. It gives you valuable industrial experience, enhances your employability and provides you with a chance to evaluate a potential employer as well as earn some money. For more information, go to p15.

Flexible entry options

For first-year entry, we accept a range of UK and overseas qualifications. Direct entry can be made to the second year of the degree programme by suitably qualified candidates. The School also offers a foundation year, ideal for students who have studied alternative subject areas and who wish to refocus their studies. The foundation year is also designed for overseas applicants or mature students whose education ceased before A-level standard. See p10 for details.

Student sponsorship

The School encourages you to consider industrial sponsorship. As well as the financial benefits such sponsorship brings, it also offers the possibility of vacation employment, giving experience of the industrial environment and the prospect of a job at the end of the degree. A sponsored student may also choose to complete a final-year project that is linked to the company.

This is a chance to gain an insight into the challenges and rewards of working in a commercial organisation.

A successful future

The course produces engineers with a solid knowledge in biology and medical science, opening up career opportunities in the bioengineering industry and the NHS. As well as providing a first-rate academic experience, we want you to be in a good position to face the demands of a challenging economic environment. During your studies, you develop key transferable skills considered essential for a successful career. For more information on careers in bioengineering, see p8.

DID YOU KNOW?

Kent was ranked 1st in the UK for overall student satisfaction in Electronic and Electrical Engineering in the National Student Survey 2015.
SUPERB STUDENT EXPERIENCE

Based on a scenic and well-located campus, you have the use of excellent systems and resources.

You become part of a modern university, with access to state-of-the-art facilities, enabling you to have an enjoyable and expansive student experience.

The School of Engineering and Digital Arts recently invested over £1.5m on updating its teaching and computer laboratories. The School has an engineering laboratory and four air-conditioned computer suites featuring around 150 high-end computers. As well as extensive professional CAD and development software, we also have PCB and surface-mount facilities. Specialist facilities include a large anechoic chamber, 3D body scanner and motion-capture studio. The School also has a mechanical workshop, staffed with skilled mechanical engineers and technicians.

The School of Biosciences has also invested £1 million in its teaching laboratories to ensure that you have an excellent environment for developing your practical skills.

Beautiful green campus
Our campus is set in a stunning location. It has plenty of green and tranquil spaces, both lawns and wooded areas, with a view of the city and Canterbury Cathedral. It has a reputation for being a friendly university with a cosmopolitan environment. For entertainment,

the campus has its own cinema, theatre, concert hall and nightclub. There are many cafés, restaurants and bars on campus as well as a sports centre and gym.

Everything 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 town.

Excellent study resources
Other academic facilities on campus are excellent, such as the Templeman Library, which provides extensive print and electronic collections. It is well-equipped with hundreds of study spaces and PCs, loan laptops, wireless access and printing and copying facilities, with a range of support services. Kent’s Student Learning Advisory Service provides advice on all aspects of learning and study skills. See www.kent.ac.uk/uelt/learning

Attractive location
Canterbury is a lovely city with medieval buildings, lively bars and atmospheric pubs, and a wide range of shops. The attractive coastal town of Whitstable is close by and there are sandy beaches further down the coast. London is less than an hour away by high-speed train.

Kent Extra
Kent Extra is an excellent way to get more from your time at university. It helps you to enhance your knowledge, learn new skills and improve your CV, for example by attending a summer school; by volunteering; or by taking a Study Plus course in an area that interests you. For details, see www.kent.ac.uk/kentextra
Laura Mihalache is in the first year of her BEng (Hons) in Bioengineering with a Year in Industry.

What made you choose the area of bioengineering?
I’d really enjoyed biology and mathematics and it seemed like a good way to combine the two subjects. Also, many surveys predict that in the next few years bioengineering will become an important area and will account for many of the jobs in engineering. There are many medical machines being developed at the moment and bioengineers will be needed to produce them. So I thought there would be a lot of opportunities for me.

And what attracted you to studying at Kent?
I came here for a visit because a friend was studying at Kent and I liked the campus straightaway – especially that perfect view of the city! When I came for an Open Day I realised that it was the right course for me. The lecturers seemed very well qualified and they showed us a practical experiment – a wheelchair that was able to move by sensing brainwaves.

How would you describe the teaching at Kent?
The lecturers are inspiring and talk enthusiastically about their subjects. You should see them in lectures – they are so focused on what they are teaching. It’s different to being at school because the lectures are very interactive, which is really important. If you have any questions, they explain things for you. And if you don’t understand it from one angle, they explain it from another. It’s easy to ask, or you can send them emails.

How did you find the transition to university life?
I’m from Romania but settling in wasn’t as hard as I expected. There are a lot of international students at Kent and everyone is really friendly. I know the group of bioengineering students really well – we see each other almost every day.

What about the study resources at Kent?
The University has a lot of facilities: books, computers, labs: everything is to hand and whenever I needed something, I found it. And in the labs there are always people around to help us.

So how are your studies going?
Last term I did Engineering Mathematics and this term I’m studying Engineering Analysis. This has been really interesting for me. At a time when we are seeing a lot of new technologies, engineering analysis is often behind those developments. It’s the basis of everything – all the calculations. At the moment, I’m working on a robot project. It was tricky in the beginning but now it’s fun.

I enjoy staying in the lab and working on it. The bioscience modules are teaching us about proteins, lipids – all the substances in the body. This is important because it’s the basis of everything in biology; you need to know all of it. In my lab classes I did some work with lipids and sugars – you can see exactly what is happening. You’re not just learning from books; you practise what you know.

Any plans for the future?
At the moment I think I want to work in research but it’s a bit early to say. I like engineering analysis so I’m looking forward to doing something with MATLAB, which uses formulas and coding. If you are interested in one area, you can often put more focus on it. I’m also planning to do a year in industry. Work experience is very important and I’m hoping that it will give me some ideas about what to do after graduation.

Any advice you’d like to pass on to students coming to Kent?
The first year is really busy: you have a lot of lectures and labs. But it’s manageable; you do have time to meet your deadlines. It’s important to make sure you have some fun, even when you’re really busy. Just don’t miss the lectures!
Kent equips you with essential skills to give you a competitive advantage when it comes to getting a job. Six months after graduation in 2015, more than 95% of Kent graduates were in work or further study.

Nowadays, healthcare is creating solutions that draw on the latest bioengineering technology. For instance, bioengineering has been used to develop and support:

- electronic and computer devices for the diagnosis and treatment of disease
- biomaterials for body implants
- artificial organs
- joint replacements
- structures to treat biomedical problems at the microscopic level
- technology to enhance mobility and communication for people with disabilities
- medical imaging for diagnosis or treatment
- stress analysis tools for the musculoskeletal system
- computer models to predict physiological events.

**An expanding sector**

There is strong evidence of the sector’s growth: the European Alliance of Medical and Biological Engineering and Science (EAMBES) states that this sector is vital for the health and well-being of European citizens and for the European economy. They assert that the sector growth rate is about 5-7% per year.

**Common career paths**

Bioengineering graduates typically go into careers in industry, research or healthcare (for instance as a clinical scientist within the NHS). Companies employing bioengineers include Haag-Streit, Philips Healthcare and Pentax.

Professional accreditation from the Institution of Engineering and Technology (IET) opens up many other, more general, career paths within the field of engineering. The IET provides accreditation for several degrees offered within the School of Engineering and Digital Arts (see p10). We are now applying for accreditation for our new degree in Bioengineering to bring it in line with our other programmes.

**Key transferable skills**

Studying for a degree is not just about mastering your subject area. These days employers are also looking for a range of key skills, and we encourage you to develop these within your degree programme. The ability to analyse situations, troubleshoot problems, and construct written and verbal presentations are all valuable skills, no matter what your final profession.

**Careers advice**

Our award-winning Careers and Employability Service can give you advice on how to choose your future career, how to apply for jobs, how to write a good CV and how to perform well in interviews and aptitude tests. It also provides information on work opportunities before and after you graduate. For more information on the careers help we provide at Kent, please see www.kent.ac.uk/employability
Dr Layla Larsen works as a clinical engineer in the NHS and as a lecturer at the University of Kent.

What initially attracted you to the field of bioengineering?
My father was a doctor so I was exposed to healthcare at a very young age. While in high school, I had a summer placement at our local rehabilitation centre. I was fascinated by the idea of using engineering principles and technology to solve medical problems.

As an undergraduate, did you have a career in mind?
I didn’t know what I would do when I finished, but I soon realised that I could go into many different areas – for instance, the development of medical devices or working with people who needed assistive technologies.

What route did you eventually choose and why?
I came across the NHS Clinical Scientist Scheme and I liked the idea of becoming a clinician who has direct contact with patients. The NHS offers a Scientist Training Programme which takes you through a Master’s course, as well as workplace training in a clinical setting. Following a Master’s in Biomedical Engineering, I worked in two hospitals within areas of medical electronics, ultrasound and rehabilitation. I went on to specialise in electronic assistive technologies. This involved working with people with physical disabilities and assessing them for provision of communication aids (such as that used by Stephen Hawking) and environmental control systems to improve their quality of life.

Can you describe your current work?
I have a joint post as a clinical engineer at East Kent Hospitals and as a lecturer at the University of Kent. As a clinical engineer, I work to ensure the safe use of medical devices in the hospital. I also carry out assessments of patients who have physical disabilities and impaired speech. This involves matching a person with a suitable technological solution to meet their needs. Often the people I see have very little physical movement, but if they have good head or eye movement, this can be harnessed so that they can control a computer screen. This in turn opens up a lot of possibilities for communication.

I’m also at the University for two days a week and that involves teaching and research. For instance, we are running a trial for an exoskeleton – a robotic mobility device that supports a person as they move. It allows a person who uses a wheelchair to stand and walk. On the teaching side of things, we want our students to have a good grounding in engineering, and to gain knowledge of physiological systems. The students take modules in engineering and bioscience but we also have modules that are specifically related to bioengineering applications.

And you’ve also been very involved in research.
Yes, after qualifying as a clinical engineer, I realised that there was also a lot of interesting research that I wanted to get involved in. I applied to do a PhD and worked on the development of a touch sensor for an artificial finger. It was an European Union project so I was able to collaborate with other researchers who were working on robotic hands and artificial skin.

My post-doc research was working on the development of bio-artificial liver tissue. This is a classic bioengineering project: you need the engineering skills but you also need to understand how the liver works. Liver tissue is very complex; you need a three-dimensional structure to grow the liver cells on, as well as biocompatible material and microfluidic technologies to provide nutrients to keep cells alive.

Any advice for prospective bioengineering students?
People are not all that aware of the areas you can go into with a bioengineering degree. There are so many options – companies such as Siemens and Philips Healthcare are making medical devices and there’s also research in academia or in industry, and there’s clinical work as well. It’s good to try and meet people in the field. For instance, most people don’t know what a clinical engineer does but if students are interested in finding out more, they are welcome to visit the hospital and meet other engineers working in healthcare.
CHOOSING YOUR PROGRAMME

The focus of degrees offered within the School of Engineering and Digital Arts ranges from design, through programming to specialist engineering.

Within this leaflet, we provide details of our degrees in Bioengineering.

Bioengineering
This three-year, full-time BEng programme is offered jointly with the School of Biosciences. The course produces engineers with a solid knowledge in biology and medical science, opening up career opportunities in the bioengineering industry and the NHS. You can also take Bioengineering with a Year in Industry. See p15 for details.

Other degree programmes
The following degrees are also available within our School. For details, see the relevant leaflet – www.kent.ac.uk/studying/leaflets

Electronic and Communications Engineering
This programme, which is offered full-time as either a three-year BEng or four-year MEng course, teaches all aspects of electronic engineering, allowing its graduates to enter any branch of electronics. Its broad syllabus includes analogue and digital circuits and systems, mobile and other communications, and computing for electronics.

Computer Systems Engineering
In this programme, you develop the skills and expertise needed to design computer systems. This includes up-to-date detailed knowledge of computer hardware and software and background knowledge of electronics, communications systems and control theory. The programme is offered full-time as either a three-year BEng or four-year MEng course and is jointly taught by EDA and the School of Computing.

Electronic and Computer Systems
This programme is designed for candidates who already have 240 credits from modules equivalent to those on our Stage 1 and 2 Electronic and Communications Engineering programme. You study full-time for one year to gain the same level of qualification as for students taking a traditional three-year course.

Multimedia Technology and Design
This programme gives you the opportunity to develop in-depth knowledge in areas such as web design, DVD authoring, 3D modelling, special effects and compositing, and opens up the possibility of a future career in fields such as film animation, multimedia production and website creation.

Digital Arts
This exciting programme provides you with practical skills, creative thinking and design expertise through a multidisciplinary exploration of modules in website design, digital photography, moving image, graphic design, 3D modelling and animation, digital portfolio production and design for print. It can be taken as a three-year BA degree or a four-year MArt degree.

Flexible entry routes
Foundation Year
This programme is for students who do not have the qualifications needed for direct entry to the first year of our degree programmes. It covers electronics, computing, physics and mathematics. If you successfully complete the foundation year, you can go on to take either the Electronic and Communications Engineering or Computer Systems Engineering programmes. To be considered for the Bioengineering degree programme you also need to have A level Biology or Chemistry (or the equivalent).

International Students
The International Foundation Programme (IFP) is for international students. Passing the electronics pathway of the Kent IFP with an overall mark of 60% or over guarantees you entry on to the first year of the relevant degree programmes. For more details, see www.kent.ac.uk/ifp
The Foundation Year is designed for those students who do not have the qualifications for direct entry to our degree programmes.

If you successfully complete the Foundation Year, you can go to the first year (Stage 1) of any of our BEng programmes (see left). Please note that A level Biology or Chemistry is required if you wish to study the BEng in Bioengineering.

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

The modules you study during your Foundation Year are:
• Algebra and Arithmetic
• Analogue Electronics
• Calculus
• Electrical Principles and Measurements
• Electromagnetics for Engineers
• Graphs, Geometry and Trigonometry
• Introduction to Programming using MATLAB
• Semiconductor and Digital Electronics.

For those who need it, instruction in English is also available.

**Foundation modules**

**Algebra and Arithmetic**
Algebra and algebraic manipulation provide you with mathematical tools and skills that are fundamental to engineering design.

**Analogue Electronics**
This module introduces you to the basic electronic components and their applications in real-life electronic circuits and systems.

**Calculus**
Differential and integral calculus are vital to an engineering degree. You also examine simple applications in electronics and physics.

**Electrical Principles and Measurements**
Supported by practical laboratory work and example classes, you explore the theory and practice of performing and assessing electronic measurements.

**Electromagnetics for Engineers**
In order to understand modern electronic and communications systems, you explore the basic principles of electromagnetism. Practical work and example classes assist your learning.

**Graphs, Geometry and Trigonometry**
Your problem-solving skills are enhanced by the basic trigonometry, vectors and graphical methods required to progress to Stage 1.

**Introduction to Programming using MATLAB**
This introductory module looks at computer programming and its practical application in the field of electronics. During the module, you gain a working knowledge of the MATLAB programming language.

**Semiconductor and Digital Electronics**
You look at the principles of digital electronics and digital systems, and examine some of today’s most important electronic semiconductor devices.
STUDYING AT STAGE 1

Stage 1 is the first year of your degree programme. All the core material is presented using lectures, supervisions, assignments and laboratory classes.

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

Bioengineering students take the following modules:
- Digital Technologies
- Engineering Mathematics
- Engineering Analysis
- Introduction to Biochemistry
- Introduction to Electronics
- Molecular and Cellular Biology
- Robotics Project
- Skills for Bioscientists.

**Modules: Stage 1**

**Digital Technologies**
Here, you learn the necessary theoretical background to understand the operation of large-scale digital systems and to develop the necessary skills to design the logic of moderately complex digital circuits. The module forms an introduction to the fundamental theory underlying modern digital technology, covering both combinatorial and sequential logic systems. The techniques introduced will form the basis for future modules. No previous knowledge of digital systems is assumed.

**Engineering Mathematics**
Mathematics is the fundamental language of engineering, allowing complex ideas to be formulated and developed. This module provides you with the sound basis of mathematical techniques and methods required by almost all other modules on the School’s engineering courses. Topics covered include functions and graphs, set theory, complex numbers, calculus, matrices and vectors, and probability. The lectures are supported by assessed example classes, taken in small groups.

**Engineering Analysis**
This module expands on the introductory mathematics covered in Engineering Mathematics and provides you with the appropriate mathematical tools necessary for the further study of electronic and computer systems. Topics covered include differential equations, the Fourier series, partial differentiation, Laplace, Poisson and wave equations, used to solve problems in the areas of signals, systems and electromagnetic fields. The lectures are supported by example classes, taken in small groups.

**Introduction to Biochemistry**
This module provides an introduction to biomolecules in living systems. It contrasts the simplicity of the basic building blocks (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 macromolecules and their interactions within the cellular environment.

**Introduction to Electronics**
Electronics hardware consists of various components and devices interconnected in such a way that they perform the specific functions. Here you learn about the main electronic components, how they work, what properties they have and their main usage, and gain the practical skills to perform simple measurements and tests. This module also includes a mini-project in which you gain practical laboratory experience in the design and construction of a circuit.

**Molecular and Cellular Biology**
You are introduced to the major 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.

**Robotics Project**
This module is designed to provide experience in the practical and management aspects of project work. It is supported by a lecture course and weekly supervisions. After a hands-on introduction to soldering, use of bench equipment and the computer-aided design and manufacture of a printed circuit board, you start the robotics project. This consists of constructing a robot that incorporates an additional circuit board of your own design and software of your own devising.

**Skills for Bioscientists**
Subject-based and communication skills are relevant to all bioscience courses. This module allows you to become familiar with practical skills, the analysis and presentation of biological data, and introduces some basic mathematical and statistical skills as applied to biological problems. It also introduces you to the computer network and its applications, and covers essential skills such as note-taking and essay writing.

**DID YOU KNOW?**
Kent was was ranked 13th for Electronic and Electrical Engineering in *The Guardian University Guide 2017*. 
STUDYING AT STAGE 2

Stage 2 is the second year of your degree programme.

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

Students take the following general modules:
• Computer Interfacing
• Signals and Systems.

They also take Bioengineering modules in:
• Biomechanics
• Human Physiology and Disease
• Image Analysis and Applications
• Introduction to Programming
• Physiological Measurement
• Skills for Bioscientists 2.

Modules: Stage 2

Biomechanics
In order to understand the mechanics of biological cells and the human body, you explore the principles of dynamics and machinery. Practical work and example classes assist your learning.

Computer Interfacing
Here, you engage in a major practical project involving both computer hardware and software and a series of supporting lectures, working in a group of four on a specification. Projects range from an EEG monitor to controlling a simple robot. This project provides an opportunity for you to gain experience not only in technical areas such as PC-based data acquisition, computer interfacing and visual programming but also in transferable skills such as team working, project management, technical presentation and report writing.

Human Physiology and Disease
You consider the anatomy and function of normal tissues, organs and systems in this module. We look at the manifestation of the various conditions at the level of cells, tissues and whole patient, and also discuss diagnosis, available prognostic indicators and treatments.

Image Analysis and Applications
You learn about images and image processing, image analysis, security and biometrics. You also discover how neural networks can be used as architectures for image analysis.

Introduction to Programming
The module provides you with an introduction to the basic knowledge required to understand, design and write computer programs and the basic principles underlying the process of software engineering. No previous programming experience is assumed, and the module proceeds via a sequence of lectures supported by simple exercises designed to give practical experience of the concepts introduced.

Physiological Measurement
This module introduces you to the different types of physiological parameters and various techniques for measuring these parameters. Basic analogue electronics and instrumentation techniques are included within the module.

Signals and Systems
You are introduced to basic methods and techniques for describing and analysing continuous and discrete time signals and systems. You explore notions of linear time-invariant systems and their impulse response. The convolution operation is illustrated as a means for describing the behaviour of such systems. The connection between continuous and discrete time signals is explained through the introduction of the sampling theorem.

Skills for Bioscientists 2
You have lectures on biological techniques complemented by practical classes and supervisions. There are sessions on group work, essay-writing, problem-solving and computer-based procedures to develop your transferable skills. In addition, there are presentations on careers to help you start thinking about future career options.
YEAR IN INDUSTRY

Our Bioengineering degree offers a year in industry. This is taken between Stages 2 and 3.

Study and career benefits
Employers are very keen to employ graduates who already have work experience, so this year can greatly enhance your job prospects. It also allows you to evaluate a particular career path, and gain knowledge of the working environment. If your placement is a success, you may even be offered a job with the same employer after graduation.

The practical experience can also be put to good use in your final year of study, helping you to gain a better degree. It gives you a sense of how the theory works in practice and improves your skills in many areas.

Finding a placement
The School has a dedicated placement officer, who works with the University’s Careers and Employability Service to assist you in identifying businesses and organisations offering placements. Information about opportunities will be made available to you, and the website of the Careers and Employability Service provides helpful material about opportunities and applications.

The Careers and Employability Service provides support in writing CVs and developing skills for placement applications and interviews. It also provides a reference bank of students who have completed successful placements in industry while studying at Kent.

There are frequent visits to Kent by companies who present their placement opportunities and also interview candidates.

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, many students find that they earn enough to be able to save some of their income, and this often helps them during their final year of studying at Kent.

Keeping in touch
The University maintains close contact with you during your year away. The industrial placement year is assessed by a combination of employer feedback and academic evaluation. You are required to keep a log of your training and work experience during the year and to write a report on your placement experience.

DID YOU KNOW?
The School recently celebrated 30 years of accreditation by the Institution of Engineering and Technology.
STUDYING AT STAGE 3

Stage 3 is your final year of study.

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

All students take the following compulsory modules:
• Biomaterials
• Digital Signal Processing and Control
• Human Physiology and Disease 2
• Product Development
• Project.

You also choose one module from:
• Bioinformatics and Genomics
• Cancer Biology
• Medical Physics.

Modules: Stage 3

Bioinformatics and Genomics
The past decade has seen significant advances in our ability to obtain biological data, be it protein structures or genome sequences. The bioinformatics element of this module focuses on modelling the structure, interactions and function of proteins. The genomics element introduces the basic concepts of genome sequencing and what we have learnt from the sequencing of over 1,000 different organisms. Finally, both elements are combined to use protein modelling to identify how genetic variants (such as mutations) lead to disease.

Biomaterials
In order to understand the mechanics of biological tissues and artificial implants, you explore the principles of stress analysis, biocompatibility and tissue integration. Practical work and example classes assist your learning.

Cancer Biology
This module develops your understanding of the molecular basis of cancer. You also explore how this knowledge may be used to develop new therapeutic strategies to tackle the disease in its variety of forms. You cover a range of topics such as the regulation of gene expression, cancer stem cells and differentiation; DNA structure and stability; tumour immunology;
targeted cancer therapies and the design of clinical trials.

Digital Signal Processing and Control
You build on the knowledge gained in the Stage 2 module, Signals and Systems, and apply it to the modelling and manipulation of basic control systems. This includes an introduction to the Laplace Transform and its use in describing control systems as well as Bode plots and root locus analysis. These concepts are applied to classical control problems and simple robotic systems are used to illustrate the importance of these concepts in modern control systems.

Human Physiology and Disease 2
You consider the anatomy and function of normal tissues, organs and systems as a way to understand medical conditions at the level of cells, tissues and the whole patient. You also explore diagnosis, prognostic indicators and treatments. Topics covered include: cells and tissues, membrane dynamics, cell communication and homeostasis; the nervous system; the immune system and inflammation; blood cells and clotting; the cardiovascular system; the respiratory system; the digestive system, liver and pancreas, and the urinary system.

Medical Physics
Here, you gain an overview of the role of physics and the physicist in modern medicine. This module sets out the physical and mathematical essentials of major diagnostic and therapeutic techniques such as radiology, MRI and ultrasound. The module involves several contributors from the Department of Medical Physics at the Kent and Canterbury Hospital.

Product Development
In this module, you examine the development of commercial electronic and software products, covering design, production techniques, reliability and the commercial aspects of a company.

Project
The project is conducted on an individual basis, on a topic that interests you. Bioengineering projects are specific to the unique nature of this degree programme.
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 more 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 (or invite you to attend an interview), 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 presentations in your subject area, guided tours of the campus, including the University accommodation, and the opportunity to speak to 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, see www.kent.ac.uk/ugfunding

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

For the latest information on studying at the School of Engineering and Digital Arts, please see www.eda.kent.ac.uk

Location
Canterbury

Award
BEng (Hons)

Degree programmes
• Bioengineering BEng (3D9J)
• Bioengineering BEng with a Year in Industry (05C3)

Entry requirements
• ABB at A level inc Mathematics at grade B and Biology or Chemistry at grade B, plus Electronics/Physics/Computing/Chemistry AS or A level grade B
• IB Diploma 34 points inc Mathematics (not Mathematics Studies) 5 at HL or 6 at SL, and Biology 5 at HL or 6 at SL, or IB Diploma with 16 points at Higher inc Mathematics (not Mathematics Studies) 5 at HL or 6 at SL, and Biology 5 at HL or 6 at SL
• BTEC Level 3 Extended Diploma Engineering: DDD inc a merit in the Maths III or Maths for HE modules

Direct entry to second year
Successful completion of the first year of an appropriate degree-level course; an appropriate HND qualification; an appropriate overseas diploma (equivalent to a BTEC HND).

Foundation Year
DDD at A level. For IB requirements, contact the Admissions Officer.

Year in industry
You have the option of spending a year working in industry between Stages 2 and 3. See p15 for details.

Professional recognition
We are in the process of applying for accreditation from the Institution of Engineering and Technology (IET) for our new degree in Bioengineering, to bring it in line with other programmes within the School of Engineering and Digital Arts.

Entry requirements and offer levels are subject to change. For the latest information, see www.kent.ac.uk/ug