



BIOMEDICAL ENGINEERING



BIOMEDICAL ENGINEERING AT READING

Choosing the university and the course you wish to study are important decisions. In the department of Biomedical Engineering at the University of Reading, we offer an exciting course in this emerging and promising field. Biomedical Engineering is the application of engineering to healthcare. In Biomedical Engineering we invent technologies to diagnose disease at early stages, restore lost body functions and improve quality of life for patients and the elderly.

ABOUT US

The department of Biomedical Engineering is a new department within the School of Biological Sciences. A great strength of incorporating an engineering department within a School of Biological Sciences is that we are able to bring together academics with world-leading expertise in engineering with internationally renowned colleagues from biomedical sciences to better develop novel engineering solutions to healthcare problems. We are conducting cutting edge research in a wide variety of topics such as neural engineering, cardiovascular disease, gene therapy and wearable electronics.

RESEARCH

Research plays a vital role in our undergraduate teaching. Not only does our research mean that you are taught by leading experts in their fields, you will also have the opportunity to get involved in our research during your final year research project or to take part in the Undergraduate Research Opportunities Programme during the summer.

Neural Engineering

The brain is the most complex known structure in the Universe. In the department of Biomedical Engineering we are investigating how individual neurons (brain cells) operate and how they connect to form networks. By understanding how the healthy and diseased brain works we can develop strategies and treatments for neurological disorders such as Alzheimer's disease, Parkinson's disease and epilepsy. Undergraduate students can become involved in the research during their final year project, working with stem cells, immunofluorescent probes, multi-electrode arrays and "animats", which are robots controlled by cultures of living cells.

Medical Technology

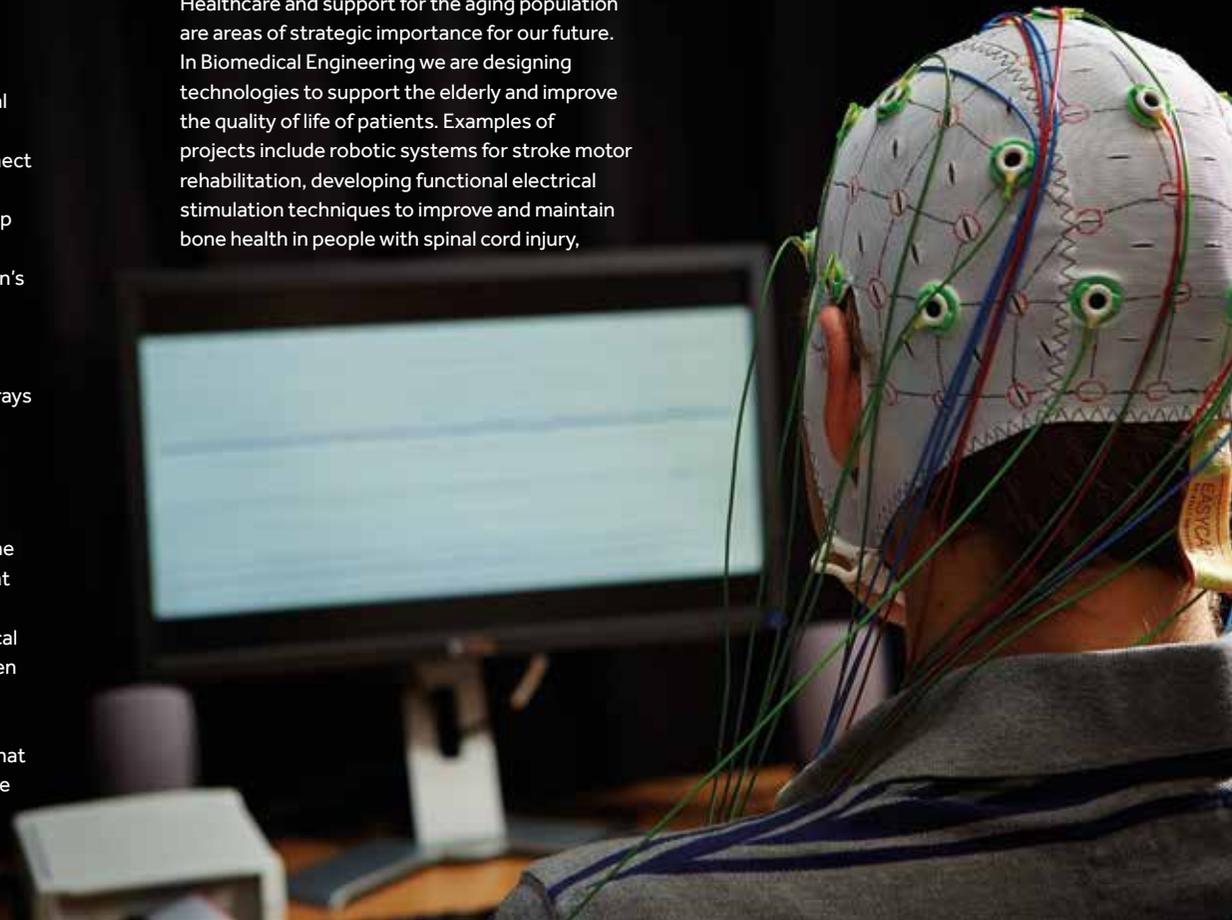
The diagnosis and treatment of diseases is at the core of Biomedical Engineering. Our department is designing novel devices that can aid in pharmaceutical development, accelerate medical diagnosis, and restore functionality that has been lost due to accident or disease. For example, our research in neuroprosthetics and implant technologies focuses on building new devices that can interface with the nervous system to restore

bladder control. We also develop haptic interfaces that can emulate "touch" in virtual environments and help dentistry students to improve their practise. Finally, we are advancing label-free imaging technologies, such as multi-photon ultraviolet microscopy and terahertz imaging for medical applications.

Rehabilitation and Aging

Healthcare and support for the aging population are areas of strategic importance for our future. In Biomedical Engineering we are designing technologies to support the elderly and improve the quality of life of patients. Examples of projects include robotic systems for stroke motor rehabilitation, developing functional electrical stimulation techniques to improve and maintain bone health in people with spinal cord injury,

and generating biocompatible scaffolds for the restoration of damaged nervous tissue. We also develop computer-based systems for speech and language therapy following stroke, brain-computer interfaces with therapeutic applications for people with long-term neurodegenerative diseases and wearable devices for sensing data from the body.



BEng BIOMEDICAL ENGINEERING

Biomedical Engineering is the application of engineering methods and designs in healthcare and biology. The end goals are to understand how different parts of the human body operate, to diagnose, prevent and treat disease and to restore bodily functions. In this programme you will learn how the brain works, what techniques exist to monitor different tissues in the human body and the science behind them, and how to design devices to rehabilitate injured patients and help the elderly. You should possess a keen understanding of mathematics and an innate curiosity for human physiology. As part of the course you will engage in practical lab based classes that will enhance different practical skills you possess.

FOR MORE INFORMATION

For more information on the course including details of modules and entry requirements visit our website
www.reading.ac.uk/ready-to-study/study/subject-area/biomedical-engineering-ug/beng-biomedical-engineering



**PRACTICAL EXPERIENCE
AND TRANSFERABLE SKILLS**

Practical experience is a significant element of the Biomedical Engineering degree. You will gain experience in techniques such as immuno-fluorescent labelling, microscopy, DNA and protein analysis, EEG recordings, cell culture and aseptic technique and analytical methods.

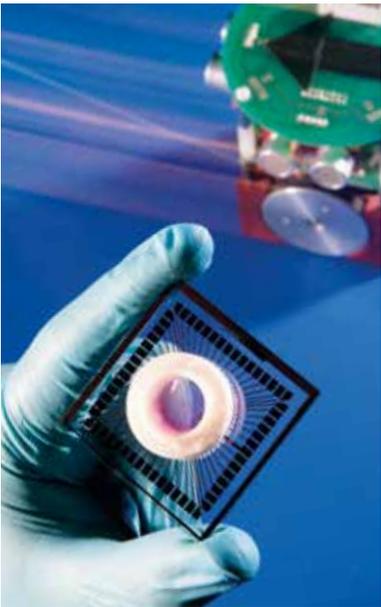
Throughout the degree you will have the opportunity to develop transferable skills that are in high demand in the biomedical sector. You will learn how to design and execute experiments, work in teams, use statistics and computing to interpret data and write essays and reports.

WHY READING?

The University of Reading is a world leading institution in the fields of biology and engineering. The new undergraduate programme in Biomedical Engineering is an exciting course that brings together 60 full time expert academics, specialising in subjects such as electronics, physiology, robotics, genetics and more.

Our aim is to inspire and train future graduate engineers that will develop the next generation of medical devices, health diagnostic systems and biocompatible prostheses. We offer BEng, MEng and PhD degrees, so you can choose the level of specialisation you wish to pursue.

We are conducting world-renowned research in the fields of neural engineering, rehabilitation and medical technology. During your degree in Biomedical Engineering you will have the opportunity to undertake original research in the above fields, while completing your final year project. We also offer a wide range of optional modules from all the degree programmes delivered by the School of Biological Sciences, as well as the option to do a placement year within the biomedical sector. In our courses, you will also develop transferable skills that are valued by employers, so upon graduation you can immediately enter a competitive job market.



MEng BIOMEDICAL ENGINEERING

Our Masters in Biomedical Engineering is a 4 year degree built around current technological developments and has a strong research focus. You will acquire a comprehensive understanding of cutting edge techniques, used to address critical medical issues. You will also be able to tailor your degree, through a flexible curriculum of optional modules. Major areas covered include biomedical instrumentation and imaging technology, rehabilitation and assistive technology, wearable devices, brain-computer interfaces, biomaterials, tissue engineering and synthetic biology. During the final year, you will plan and manage research at the forefront of the field, to produce original knowledge. Our academics propose a wide variety of interesting individual projects, based on their area of expertise and research direction. Examples include targeted application of growth factors to direct stem cell fate, use of Kinect for motor rehabilitation after brain injury, development of soft modular robotics, mid-air gesture analyser and many more.

FOR MORE INFORMATION

For more information visit our website www.reading.ac.uk/ready-to-study/study/subject-area/biomedical-engineering-ug/meng-biomedical-engineering



PLACEMENTS AND WORK EXPERIENCE

Industrial Experience

At the end of the second year of the Biomedical Engineering degree you can undertake a 1-year placement, with one of our industrial partners such as GSK, MicroChip and ReNeuron. This offers you the opportunity to gain valuable experience in the field, while building a network of colleagues that will significantly aid you in your career. During your placement year, you will still be a student of the University of Reading and will have regular contact with an academic overseeing placements.

Undergraduate Research Opportunities Programme

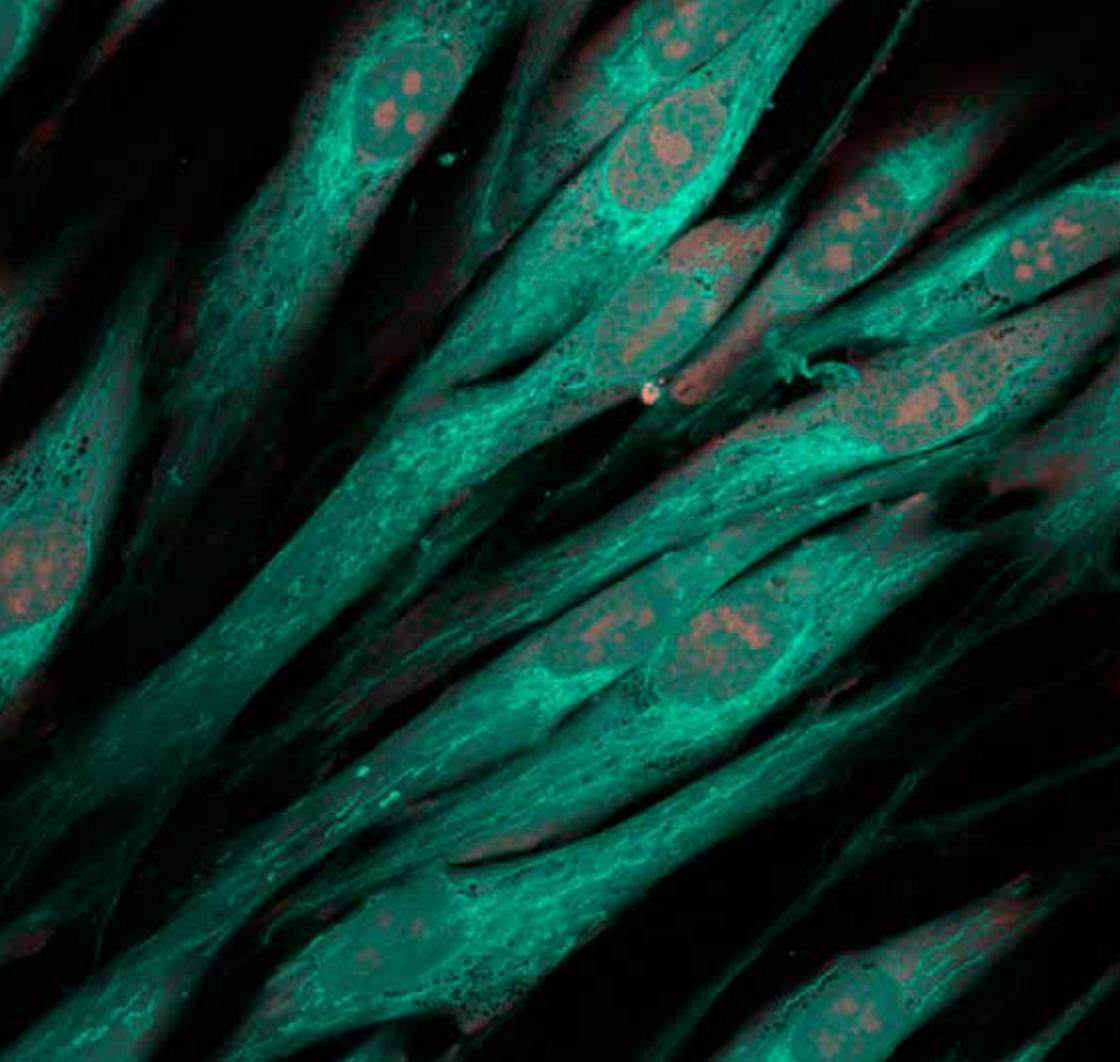
If you are interested in a career as a researcher, then the Undergraduate Research Opportunities Programme is ideal for you. Undergraduate students participating in UROP work with academic staff on research projects across the University. These placements can be either for 6 weeks over the summer break, or a longer period, if part-time. UROP offers you a unique opportunity to contribute to the creation of knowledge and successful projects

can lead to an invitation to continue your career in research through a PhD programme.

Placement Module

If you do not want to undertake a placement for 1 year, then you can take a 10-credit placement module and get credit towards your degree. This second year module allows you to work with our industrial partners over a shorter time period, usually over the summer.





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 School of Biological Sciences

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