



ME Biomedical Engineering

School of Electrical, Electronic and Communications Engineering
and the School of Mechanical and Materials Engineering

**PROFESSIONAL WORK
EXPERIENCE AVAILABLE
ON THIS PROGRAMME**

Why is this course for me?

Biomedical Engineering involves the application of engineering principles to healthcare and medicine. It is an interdisciplinary field, requiring knowledge of both living systems and engineering. The ME Biomedical Engineering at UCD provides students with a specialised education in Biomedical Engineering, taking the fundamentals of electrical, electronic and mechanical engineering developed at undergraduate level and building on these with modern biomedical engineering techniques. As part of the ME you will study Biomedical Engineering subjects such as rehabilitation engineering, neural engineering, biomechanics and medical device design. You will also have the opportunity to choose from a range of modules in physiology and anatomy, cell culture and tissue engineering alongside advanced engineering topics including advanced signal processing, nanomaterials and dynamics. There will be an emphasis on independent learning and research, with the opportunity to participate in a work placement either in the medical technologies industry, a clinical environment or with a research group. You will work with staff and researchers at UCD who have extensive experience in ground-breaking Biomedical Engineering research. You will also develop a knowledge of how the medical device

industry is regulated and how new products are introduced to the market, drawing from experience within UCD which includes pioneering companies such as BiancaMed. Upon graduation from the Biomedical Engineering Master's degree at UCD you will have the knowledge and experience to follow a career in the medical devices and technologies industry or to pursue PhD research in Biomedical Engineering and related areas.

Professional Work Experience:

The Professional Work Experience (PWE) module is incorporated into the two-year Masters of Engineering Programme and is designed to integrate a student's academic and career interests with paid practical work experience for a 6-8 month period. The module provides students with the perfect opportunity to gain increased experience and understanding of their chosen field, assess where their strengths and weaknesses lie and maximise their knowledge of the available career possibilities. The practical skills acquired during this placement will give graduates a competitive advantage when applying for positions upon graduation.

Why study at University College Dublin?

Some of the reasons to study at UCD:

- Top1% world university
- Ireland's leading provider of graduate education
- Ireland's largest and most international university
- Emphasis on research and innovation
- Safe, modern campus in Dublin, capital city of Ireland
- Extensive range of on-campus accommodation

UCD College of Engineering and Architecture

The UCD College of Engineering and Architecture's research and taught programmes are centred around a wide variety of activities spanning basic, strategic and applied research from the diverse range of disciplines covered by the Schools of Architecture, Biosystems Engineering; Chemical and Bioprocess Engineering; Civil, Structural and Environmental Engineering; Electrical, Electronic and Communications Engineering and Mechanical and Materials Engineering.

We have a proud history in research going back 100 years. Today, there are exciting opportunities for those wishing to pursue a higher research degree to doctoral or masters level. Within the broad disciplines listed above there are many research centres, clusters and institutes led by highly experienced and world-renowned researchers.

The College has an excellent track record in attracting significant Science Foundation Ireland (SFI), European and industrial funding to support its many research activities. Through research, the UCD College of Engineering and Architecture continues to promote excellence in Graduate training. The range of interdisciplinary taught Master's programmes now available within the college, and initiatives including the Structured and Thematic PhD programmes, mean that the Graduate School is ideally placed to offer innovative graduate level training programmes.

UCD School of Mechanical and Materials Engineering

The UCD School of Mechanical and Materials Engineering offers the widest range of both research-based and taught postgraduate programmes. Building on a long history, it has always moved with the changing needs of industry and the global marketplace and today offers specialist programmes in Energy Systems, Mechanical, Materials, Bioengineering and Engineering Management.

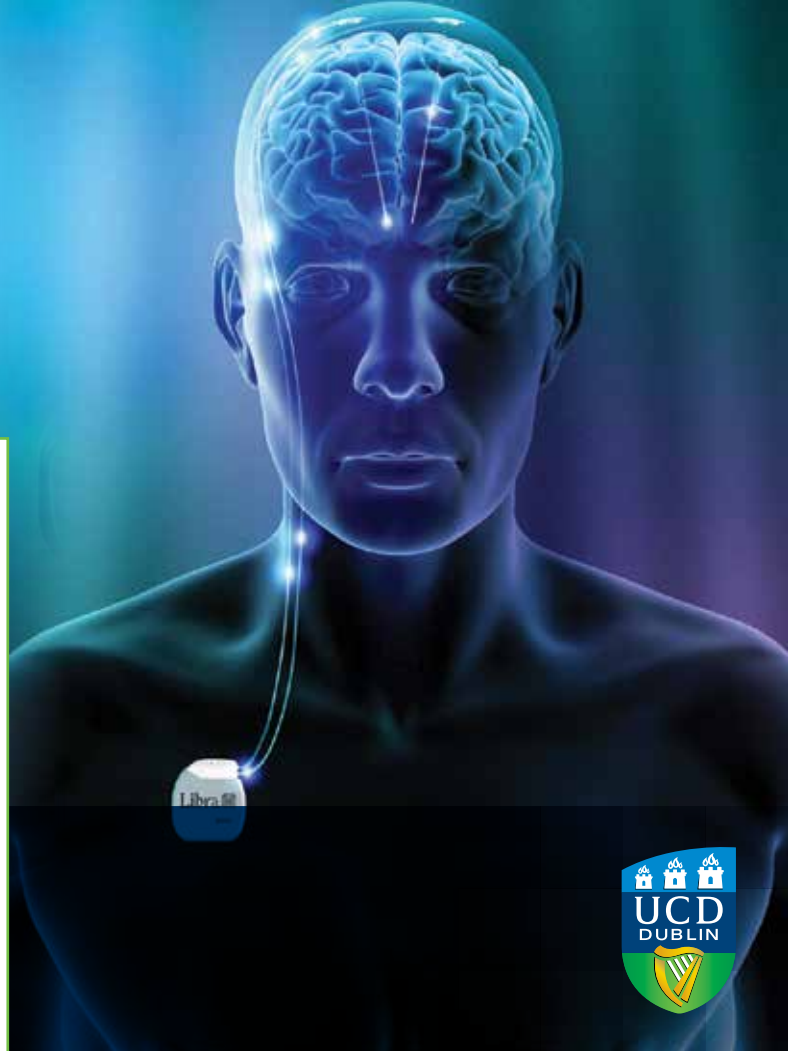
As well as taught programmes, there is a wide variety of research opportunities available. Research has always had a strong industry focus and the school boasts the first ever UCD spin-out company, The Timoney Technology Group, over 40 years ago.

The School of Electrical, Electronic and Communications Engineering

Electrical and Electronic & Communications Engineering in UCD has a proud record of excellence and achievement in postgraduate education, PhD-level research and providing research publications to the highest international standards.

We believe research is a vitally important part of our mission, not just for its own sake but because international experience shows that the highest-quality graduate experience takes place in a research-intensive context. We are wholly committed to providing a first-rate graduate formation to our students. We are clear in placing strong emphasis on the scientific and mathematical fundamentals of the discipline, as the best long-term preparation for a student destined for a leadership role in a world of rapid technical change.

Much of our research is carried out in strong partnership with leading-edge industry and is also located within a strong web of collaborations with international academic and industry-based centres of excellence. While research outputs are of high academic quality, they also have had high impact in terms of innovation including an excellent track record of successful new company formation.



What will I study?

This course comprises 120 credits. Students will take 6-8 month Professional Work Experience (30 credits) and conduct a research project (20 credits):

- Cell Culture & Tissue Engineering
- Biomedical Signals and Images
- Neural Engineering
- Medical Sciences for Biomedical Engineers
- Medical Device Design
- Nanomaterials
- Biomaterials
- Neuromuscular and Membrane Biology
- An introduction to Physiology: Human cells and tissues
- Physiology of the Cardiovascular System

What are the career opportunities?

Some key Irish Medtech facts/ figures:

- There are currently 250 medical technology companies in Ireland, exporting €7.2b worth of product annually and employing 25,000 people - the highest number of people working in the industry in any country in Europe, per head of population.
- Exports of medical devices and diagnostics products now represent 8% of Ireland's total merchandise exports; and growth prospects for the industry globally remain good.
- Many of the world's top medical technology companies have invested significantly in Ireland and a number of exciting, research-based, indigenous companies are emerging and competing internationally.
- 50% of the companies in the sector are indigenous (ref Enterprise Ireland)
- The Irish government has identified the medical technology sector as one of the key drivers of industrial growth for the future and provides a wide range of supports to encourage and foster this growth.

The medical technology industry in Ireland is changing from being prominently manufacturing to being more complex and driven by R&D. There are excellent employment opportunities in this sector.



Academic profile

Dr Madeleine Lowery, Programme Director

Dr Madeleine Lowery is a Senior Lecturer in the School of Electrical, Electronic and Communications Engineering, University College Dublin. Her research involves exploring how the nervous and muscular systems work together in order to improve our understanding of how humans control movement in both health and disease. The Neural Engineering and Neuromuscular Control research group at UCD use engineering methods including mathematical modelling, signal analysis, and experimentation, to better understand the neuromuscular system and to develop technologies to improve rehabilitation strategies and therapies. Her research projects include myoelectric control of artificial limbs, electrical stimulation, deep brain stimulation and neural control of movement.

Entry Qualifications

Applicants must have:

- A first cycle honours (2:1) Bachelor Degree in Biomedical, Electronic or Mechanical Engineering
- A complete application which includes a detailed explanation of your interest in the programme
- Names and contact details of two referees who can assess your intellectual ability, maturity and motivation
- Applicants may be required to attend an interview as part of the application process.

Note: International students who have sat the GRE, are invited to submit their result as part of the application process.

If English is not your native language, the minimum acceptable score on the TOEFL Internet Based Test is 90 and on IELTS it is 6.5.

Duration

This ME is two years in duration but can be completed in 12 months with the requisite prior learning.

Contact us

General admission queries: Rebecca Patterson / Karina O'Neill
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Tel: +353 1 716 1916/1781
www.ucd.ie/eacollege

Applying Online

To apply online, please go to www.ucd.ie/apply, create a user account, and then select 'ME Biomedical Engineering (T160)'.

Useful Links

www.ucd.ie/programmes/t160
www.ucd.ie/graduatestudies/coursefinder/