



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Biomedical Engineering (BAI/MAI)

Department of
Mechanical, Manufacturing and
Biomedical Engineering



Programme Overview

Biomedical engineering is at the intersection of engineering, the life sciences and healthcare. Biomedical engineers take principles from applied science (including mechanical, electrical, chemical and computer engineering) and physical sciences (including physics, chemistry and mathematics) and apply them to biology and medicine. Although the human body is a more complex system than even the most sophisticated machine, many of the same concepts that go into building and programming a machine can be applied to biological structures and systems leading to new diagnostic and therapeutic tools. The goal is to better understand, replace or fix a target system to ultimately improve the quality of living and healthcare.

Biomedical engineers become involved in research and development, spanning a broad array of subfields: biofabrication, bioprinting, biomechanics, biomaterials, tissue engineering, neural engineering, medical devices, clinical engineering, medical imaging. Prominent

biomedical engineering applications include the development of biocompatible prostheses, various diagnostic and therapeutic medical devices ranging from clinical equipment to micro-implants, advanced imaging methods such as MRIs and EEGs as well as development of regenerative materials, engineered tissues and artificial organs.

Biomedical engineering is one of the fastest-growing careers and this trend is expected to continue over the next decade. Ireland's medical technology sector has evolved into a global leader for medical device and diagnostic products, with exports annually exceeding €12bn. Ireland has over 450 companies involved in developing, manufacturing and marketing medical devices. These include Abbott, Bayer, Becton Dickinson, Boston Scientific, Johnson & Johnson, Guidant, Medtronic and Stryker. These companies have a strong demand for high quality graduates at the master's and Ph.D. level because of the high technical level of their products.

www.tcd.ie/mecheng

Programme Content

This is a fully accredited program covering topics in areas of mechanical, manufacturing, and electronic engineering, specialised topics in biomedical engineering and courses in basic medical and biological sciences. Example biomedical modules include: Biomechanics, Biomaterials, Anatomy and Physiology, Cell and Molecular Biology, Medical Device Design, Tissue Engineering, Neural Engineering, Medical Imaging.

Project work is an important aspect of this degree and there are extensive research facilities available to students. Each student will carry out several projects, including a major capstone research project in their final year. Examples of final-year projects include:

- Design of a branch stent for abdominal aortic aneurysm
- Finite element modelling of 3D printed scaffolds for bone tissue engineering
- Next generation hearing prostheses: improved decoding of attentional selection
- The effect of freezing on the mechanical properties of decellularized arteries
- Head kinematics in contact sports

Programme Requirements

Leaving Certificate:	H4 Mathematics
Advanced GCE (A Level):	Grade C Mathematics
International Baccalaureate:	HL Grade 5 Mathematics

Application Details

Students who wish to study biomedical engineering apply to the general engineering degree (TR032).

The first two years are common to all engineering students and at the end of the second-year students select biomedical engineering.

Further details can be found here.
<https://www.tcd.ie/mecheng/undergraduate/>

Contact Details

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QS subject rankings, 2023

