

What is Biomedical Engineering?

Biomedical engineering has a huge impact on the world we live in today. There are now a variety of medical devices and machines that can both improve health and save lives, thanks to biomedical engineering. Biomedical engineering is the fusion of engineering expertise with the world of clinical medicine, developing technologies such as laser systems used in corrective eye surgery and systems for analysing blood. Biomedical engineering is key in the development and recreation of artificial organs, limbs and skin.

What do Biomedical Engineers do?

Biomedical engineers play an exciting and critical role at the frontier of technological advances to improve healthcare. They apply engineering expertise and ingenuity to design systems to help prevent, diagnose and treat all types of diseases, injuries and disabilities. The biomedical engineer will work with healthcare professionals including physicians, doctors, nurses, therapists and technicians.'

Biomedical engineering is a widely diverse subject and allows the student to specialise in a variety of areas:

- **Cellular, tissue and genetic engineering:**

researching biomedical problems at the microscopic level in order to understand disease processes.



- **Biomaterials:** researching and selecting the appropriate materials for implantations in the human body such as artificial pace makers, hips, and kidneys
- **Biomechanics:** applying classical mechanics to biological or medical problems in order to develop such devices as the artificial heart and artificial joint replacements.

- **Rehabilitation engineering:** enhancing the capabilities and improving the quality of life for individuals with physical and cognitive impairments through the design and development of prosthetics and assistive technology.
- **Orthopaedic engineering:** applying methods of engineering to understand the function of bones, joints and muscles to design artificial joint replacements.
- **Neuroscience:** researching into the processes involved in cognitive functions and providing objective diagnostic information for a number of psychiatric disorders.
- **Clinical engineering:** specialises in the application life cycle of medical equipment technologies, from their input and application management to decommissioning and disposal.





Career Opportunities

Biomedical engineering offers a whole host of career opportunities working for the benefit of the health of all mankind. As a biomedical engineer, technologist or technician you can work for:

- **Industry:** innovating and creating designs for new technologies or testing of new technologies for safety and performance.
- **Government:** product testing and establishing safety standards for medical devices.
- **Hospitals:** providing advice on the selection and application of medical equipment, as well as supervising its performance testing and maintenance, building customised devices for special health care or research needs.
- **Consultancy:** providing technical advise for marketing departments of companies.
- **Research Centres:** supervising laboratories and equipment, and participating in direct research activities in collaboration with other researchers with such backgrounds as medicine, physiology, and nursing.

Did you know?

Artificial pacemakers detect when the human heart is not producing its own electrical impulses and fills in the gaps.

Engineering provides a host of exciting opportunities for individual enterprise and job flexibility with rapid progress to creative, responsible and financially rewarding careers.

For more information look up www.steps.ie



Aeronautical	
BIOMEDICAL ENGINEERING	Biomaterials
Biosystems, Agriculture & Food	Biomechanics
Building Services	Clinical
Chemical Engineering	Genetic
Civil Engineering	Neuroscience
Computer & Software Engineering	Orthopaedic
Electrical Engineering	Rehabilitation
Electronic Engineering	
Industrial & Manufacturing	
Mechanical Engineering	

www.steps.ie

As a biomedical engineering graduate you can:

- Design and develop medical instruments and equipment.
- Research the engineering aspects of biological systems.
- Research new materials for medical products.
- Adapt or design computer hardware and software for medical uses.
- Design technology to assist people with disabilities.

Employers of biomedical engineering graduates include:

Boston Scientific, Medtronic, Becton Dickinson, Stryker Orthopaedics to name but a few.

 ENGINEERS IRELAND

 Discover Science + Engineering

STEPS to engineering is an Engineers Ireland programme supported by Discover Science & Engineering, the Department of Education & Science, FÁS and industry.