Bioengineering for Surgery.

Nicolas Rouleau*
Department of Biomedical Engineering, Tufts University, United States

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Editorial

Bioengineering may be a relatively new discipline that mixes many aspects of traditional engineering fields like chemical, electrical and engineering. Samples of bioengineering include.

- Artificial hips, knees and other joints
- Ultrasound, MRI and other medical imaging techniques
- Using engineered organisms for chemical and pharmaceutical manufacturing

In addition, bioengineering graduates are prepared for continued study to pursue careers in medicine, law, business and other fields

Biological engineering, bioengineering, or bio-engineering is that the application of principles of biology and therefore the tools of engineering to make usable, tangible, economically-viable products.[1] Biological engineering employs knowledge and expertise from variety of pure and applied sciences,[2] like mass and warmth transfer, kinetics, biocatalysts, biomechanics, bioinformatics, separation and purification processes, bioreactor design, surface science, hydraulics , thermodynamics, and polymer science. it's utilized in the planning of medical devices, diagnostic equipment, biocompatible materials, renewable bioenergy, ecological engineering, agricultural engineering, and other areas that improve the living standards of societies. samples of bioengineering research include bacteria engineered to supply chemicals, new medical imaging technology, portable and rapid disease diagnostic devices, prosthetics, biopharmaceuticals, and tissue-engineered organs.[3][4] Bioengineering overlaps substantially with biotechnology and therefore the biomedical sciences during a way analogous to how various other sorts of engineering and technology relate to varied other sciences (such as aerospace engineering and other space technology to kinetics and astrophysics .In general, biological engineers (or biomedical engineers) plan to either mimic biological systems to make products or modify and control biological systems in order that they will replace, augment, sustain, or predict chemical and mechanical processes.[5] Bioengineers can apply their expertise to other applications of engineering and biotechnology, including genetic modification of plants and microorganisms, bioprocess engineering, and biocatalysis. Working with doctors, clinicians, and researchers, bioengineers use traditional engineering principles and techniques and apply them to real-world biological and medical problems.

Biomedical engineering has evolved over the years in response to advancements in science and technology. Throughout history, humans have made increasingly simpler devices to diagnose and treat diseases and to alleviate, rehabilitate or catch up on disabilities or injuries. One example is that the evolution of hearing aids to mitigate deafness through sound amplification. The hearing aid , an outsized horn-shaped device that was delayed to the ear, was the sole "viable form" of hearing assistance until the mid-20th century, consistent with the Hearing Aid Museum. Electrical devices had been developed before then, but were slow to catch on, the museum said on its website Bioengineering may be a discipline that applies engineering principles of design and analysis to biological systems and biomedical technologies. samples of bioengineering research include bacteria engineered to supply chemicals, new medical imaging technology, portable disease diagnostic devices, and tissue engineered organs.

Students in bioengineering are trained in fundamentals of both biology and engineering, which can include elements of electrical and engineering , computing , materials science, chemistry, and biology. This breadth allows students and school to concentrate on their areas of interest and collaborate widely with researchers in allied fields.

The first biological engineering program was created at University of California, San Diego in 1966, making it the primary biological engineering curriculum within the us .[11] newer programs are launched at MIT[12] and Utah State University.[13] many aged agricultural engineering departments in universities over the planet have re-branded themselves as agricultural and biological engineering or agricultural and biosystems engineering, thanks to biological engineering as an entire being a rapidly developing field with fluid categorization. consistent with Professor Doug Lauffenburger of MIT,[12][14] biological engineering features a broad base which applies engineering principles to a huge range of size and complexities of systems. These systems range from the molecular level (molecular biology, biochemistry, microbiology, pharmacology, protein chemistry, cytology, immunology, neurobiology and neuroscience) to cellular and tissue-based systems (including devices and sensors), to whole macroscopic organisms (plants, animals), and may even range up to entire ecosystem

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