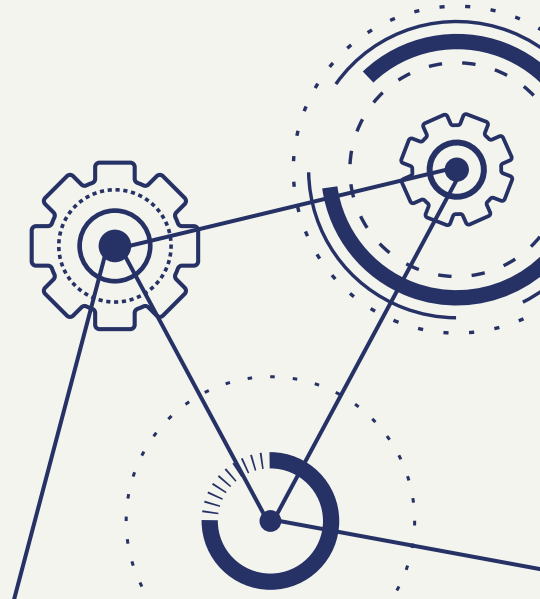


Bioengineering & **Synthetic Biology**

Alyssa Chiulli



Does anyone know what
Bioengineering or
Synthetic Biology is?

*Biomedical Engineer
doing his job*

What is **Bioengineering**?

Biological engineering or bioengineering is the application of principles of biology and the tools of engineering to create usable, tangible, economically viable products.



What bioengineers do but the DNA is a lot smaller (AI)



What is **Synthetic Biology**?

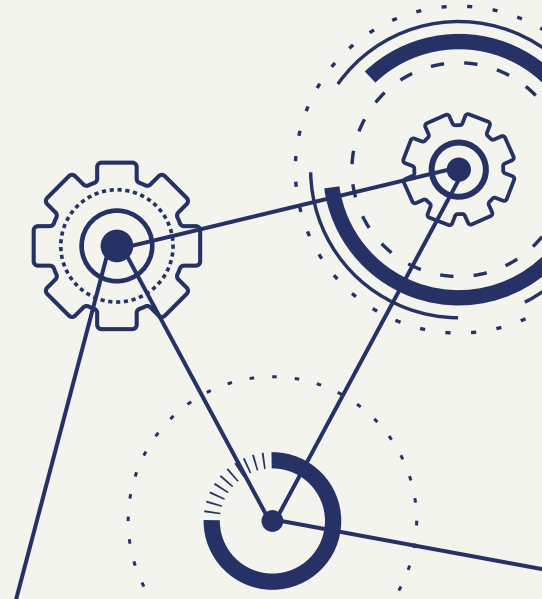
Synthetic biology is a multidisciplinary field of science that focuses on living systems and organisms, and it applies engineering principles to develop new biological parts, devices, and systems or to redesign existing systems found in nature.

Jobs in Bioengineering

- Biomedical Engineering
- Clinical Engineer
- Research Engineer
- Product Development Engineer
- Biostatistician
- Biologist
- Medical Technician
- Bioprocess Engineer
- And more...



Biomedical
Engineer



What does a **Bioengineer** typically do?

Design equipment and devices, such as artificial internal organs, replacements for body parts, and machines for diagnosing medical problems.

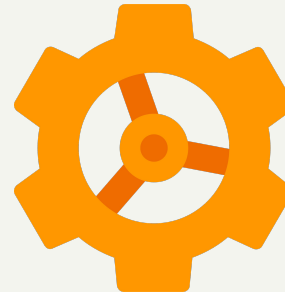
Install, maintain, or provide technical support for biomedical equipment, and more!



Biomedical Engineer creating a leg prosthetic



+

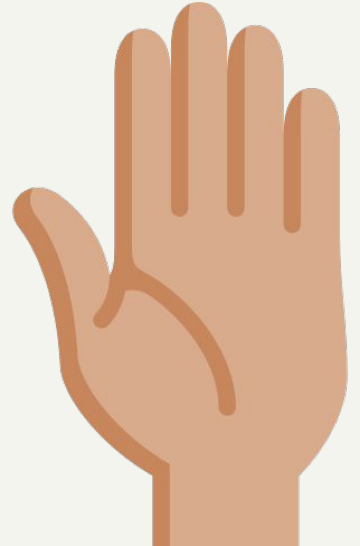


What inventions have **Bioengineers** made?

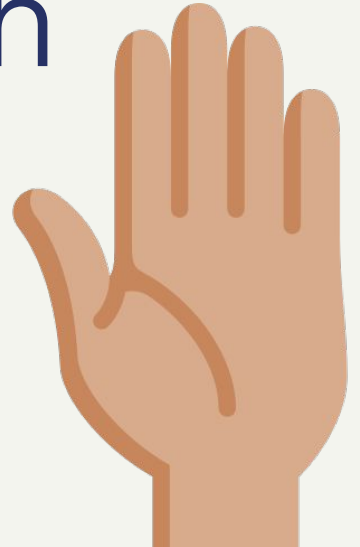
Crutches, medical imaging, prosthetics, gene editing, vital sign tracking, physical therapy devices and exercise equipment, and computerized surgery



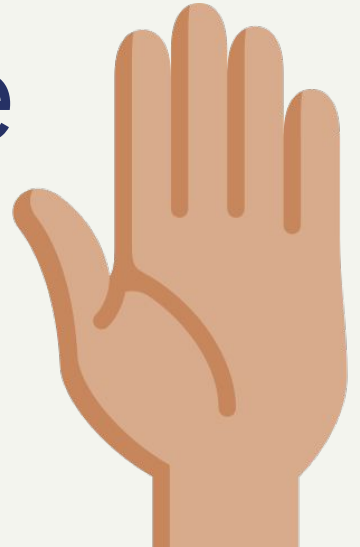
Quick Activity: Raise Your Hand



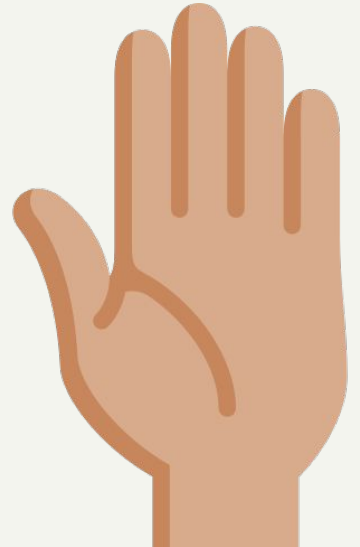
Raise your hand if you have ever used any of these inventions (Such as crutches, prosthetics...)



Raise your hand if you
have heard about
bioengineering before
this



Raise your hand if you
know anyone who has a
job in a field involving
bioengineering



We have also had countless **Medical Advancements**

- Use stem cells to regenerate damaged or degenerated tissues.
- Gene editing (CRISPR has been used to experiment with gene-edited mosquitos to reduce the spread of malaria)



Synthetic Biology (Explanation)

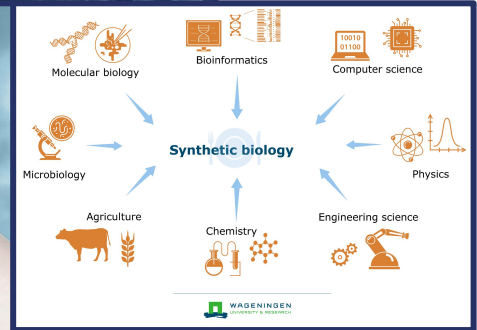
A field of science that involves redesigning organisms for useful purposes by engineering them to have new abilities.

Goal: to develop a large portfolio of engineered biological circuits for use in various applications or systems.

A explanation of synthetic biology



*What bioengineers do but
the DNA is a lot smaller (AI)*

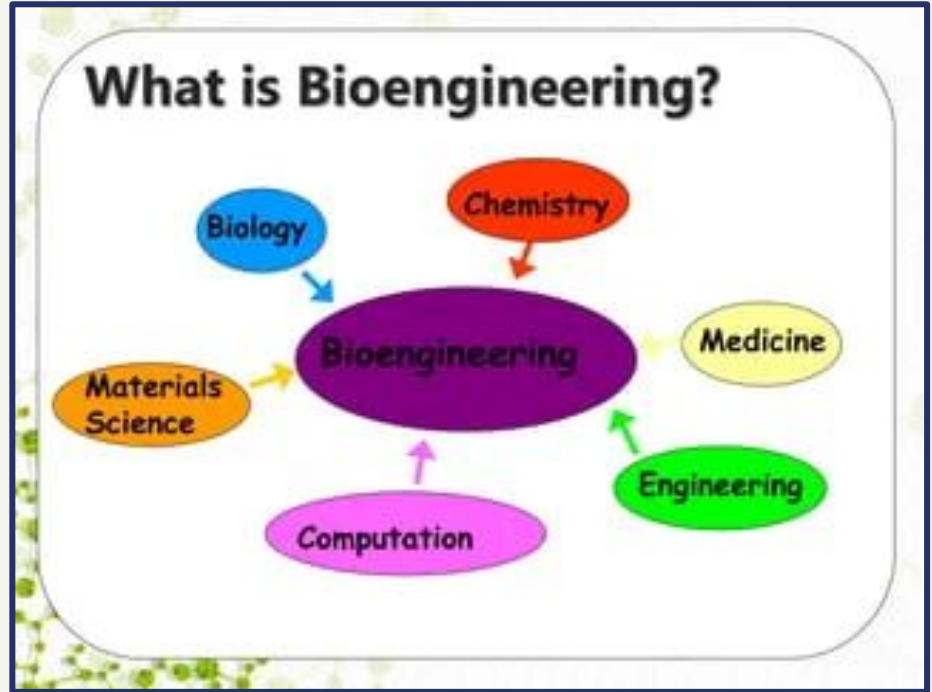


*Fields in synthetic
biology*

What Specializations are in Bioengineering?

- Bioinformatics
- Bioinstrumentation
- Biomaterials
- Biomechanics
- Biomechatronics
- Biomimetics
- Biotechnology
- Pharmaceutical Engineering
- Neuroengineering
- Synthetic Biology
- Systems Biology

A diagram of all the fields in bioengineering

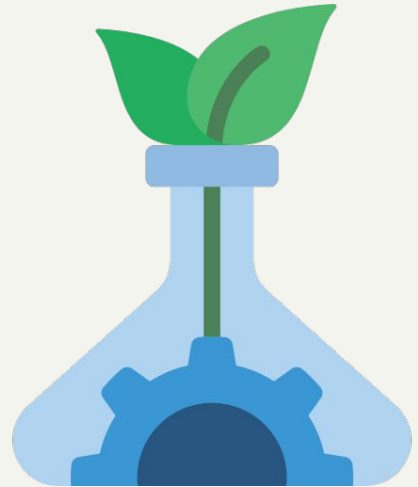


Bioengineers can expect to make around (annually)

\$86k-\$150k



Raise your hand if you
would consider ever
pursuing a job in
bioengineering



Resources

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