Introduction to Engineering Disciplines

Summer School- A Taste of Science and Engineering

Dr. Modupe O. Jimoh

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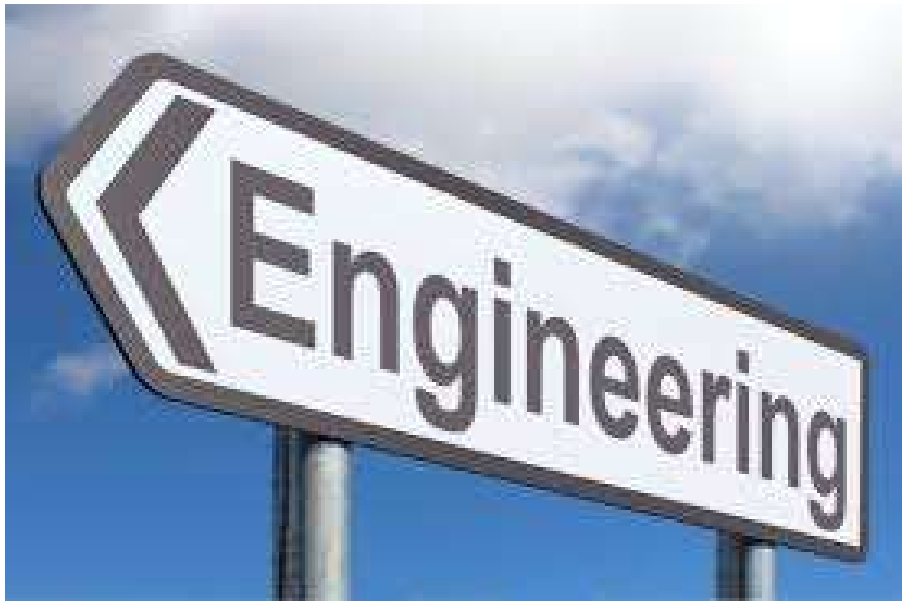
Introduction to Engineering Disciplines



Introduction

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- **Engineering** encompasses the necessary knowledge and procedures to conceptualize, design, manufacture, construct, operate, maintain, dispose, or recycle something with substantial technical aspects for a particular purpose. This could be a concept, a model, a product, a device, a process, a system, or a technology.

- **Technology** is an enabling package of knowledge, devices, systems, processes, and other technologies, created for a specific purpose. The word technology is used colloquially to describe a complete system, a capability, or a specific device.

- **The Engineer**, and others, use technology to create something new; a product, a manufacturing process, a system, a new technology.

Agricultural Engineering

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- Agricultural Engineers are the specialists who help solve global challenges which affect all of us, such as feeding a growing population with increasingly scarce resources while protecting the environment.

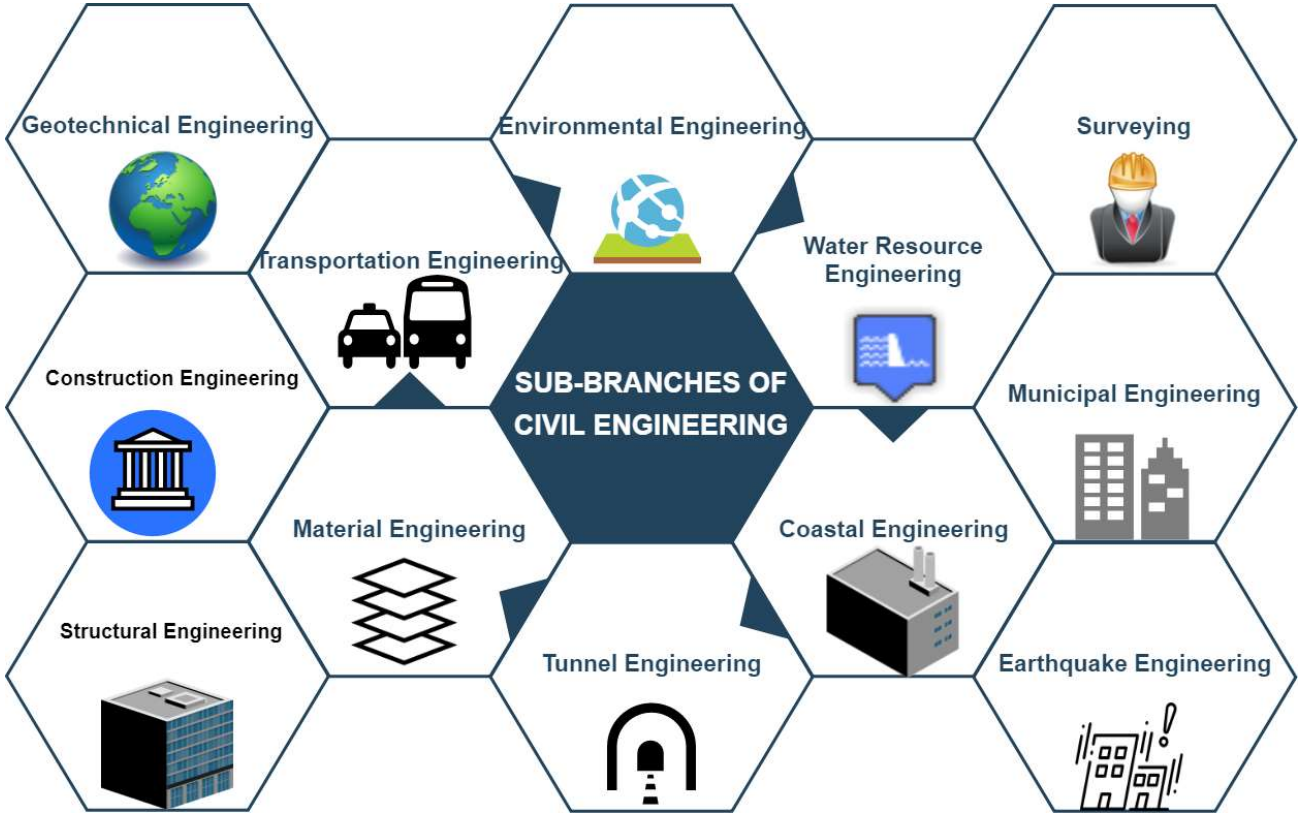
- Agricultural engineers build, service and repair agricultural, horticultural and forestry machinery and equipment.

Chemical Engineering

- The engineering disciplines associated with the process of natural and synthetic materials, liquids and gasses.
- Closely related fields: Mining, Oil, Gas and Nuclear engineering.

Civil Engineering

The engineering disciplines associated with the creation, improvement and maintenance of both the built and natural environment.



Environmental Engineering

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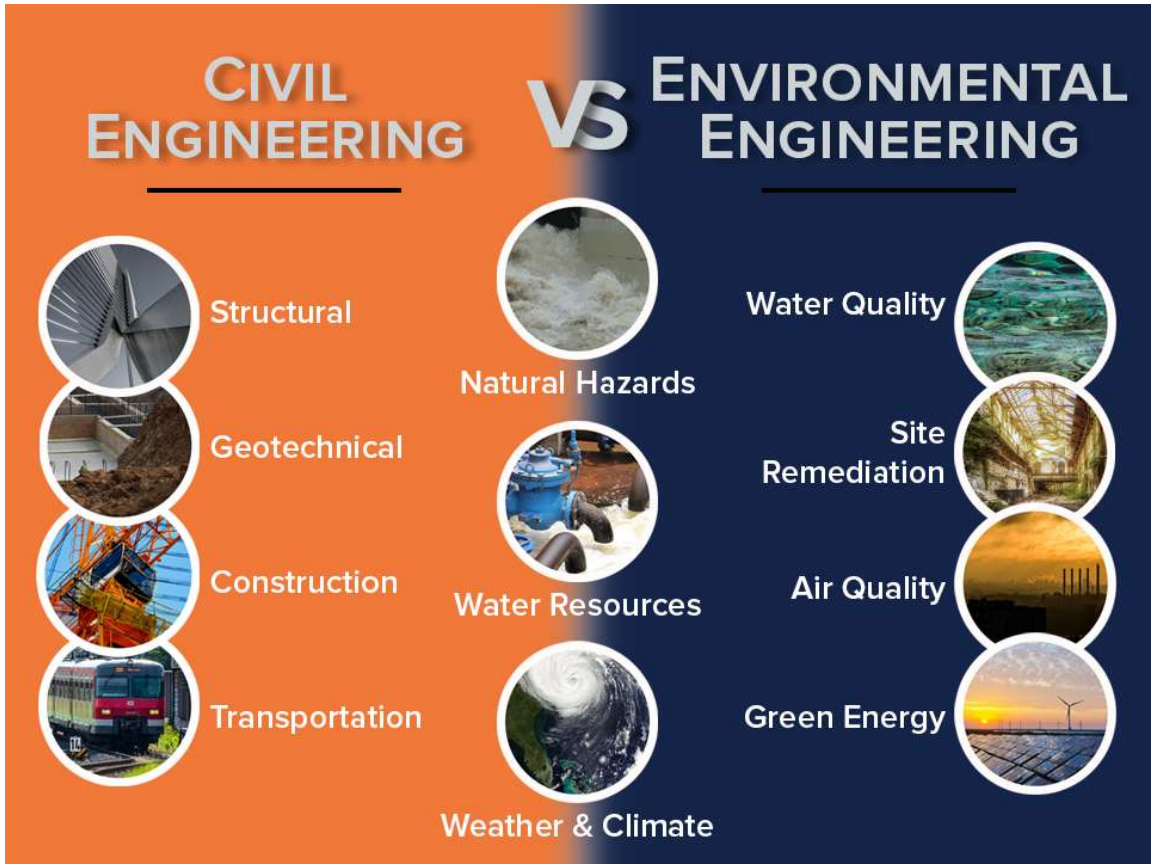
Environmental engineers develop methods to protect and preserve natural resources, including water, air, and soil, in order to promote a sustainable future.



Electrical and Electronic Engineering

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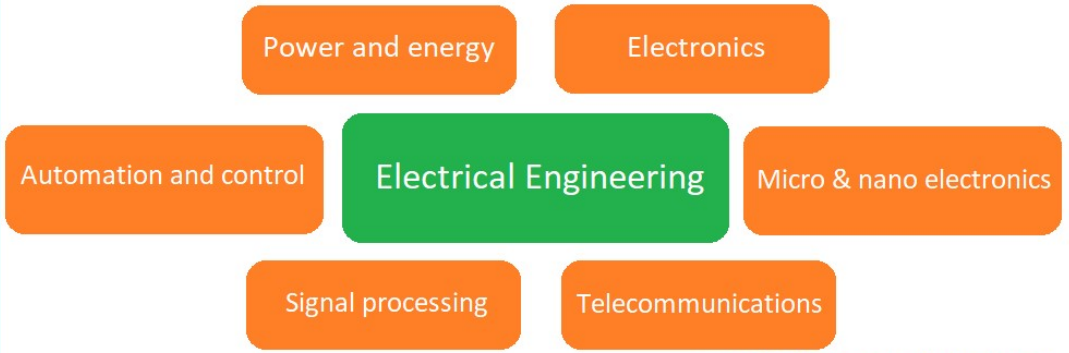
What is Electrical Engineering?

It mainly deals with the production and distribution of electricity & electrical devices.



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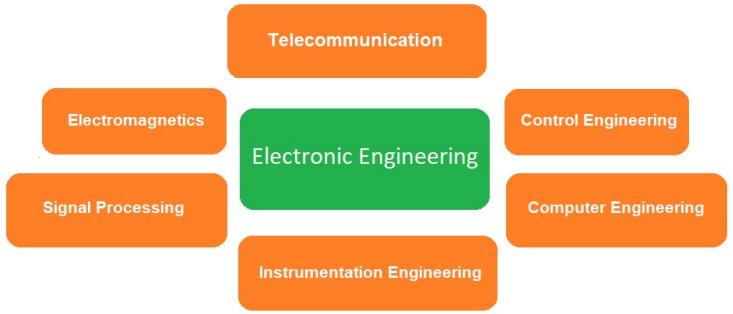
What is Electronic Engineering?

Electronic engineers deal with the designing, testing and analysis the electrical devices.

Involve in the manufacturing of power generation equipments, autmobiles, electrical motors, radar systems, aicrafts and communication systems.



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Computer Engineering

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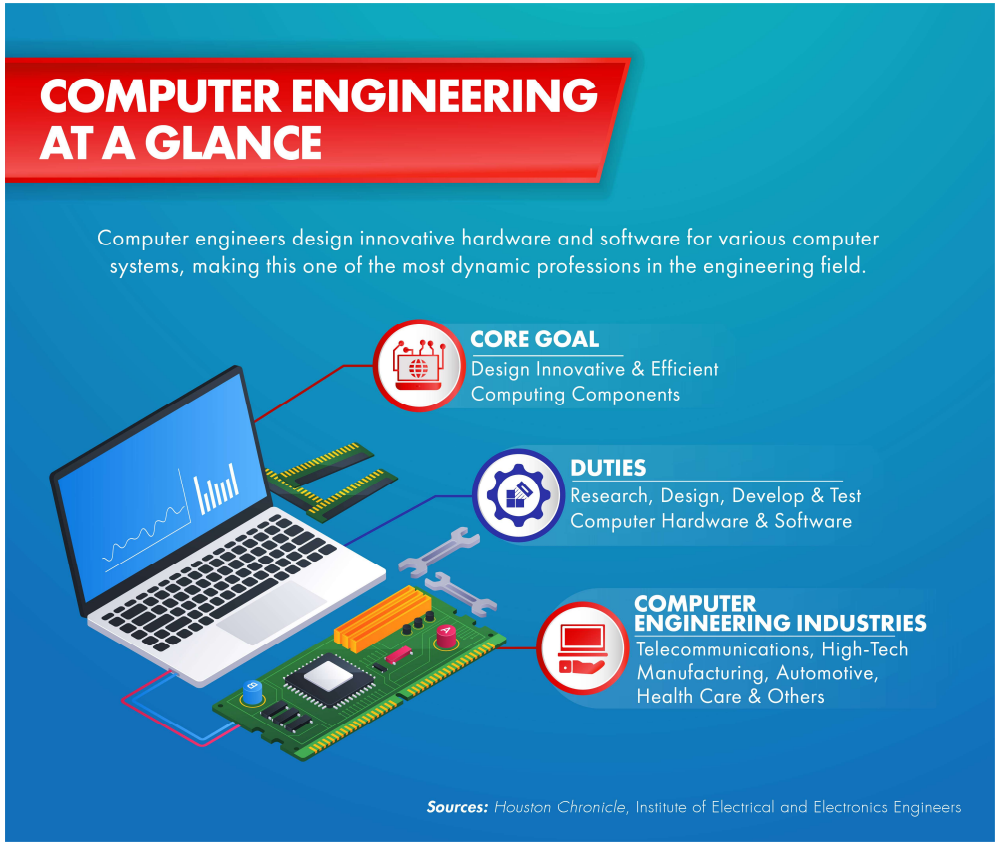
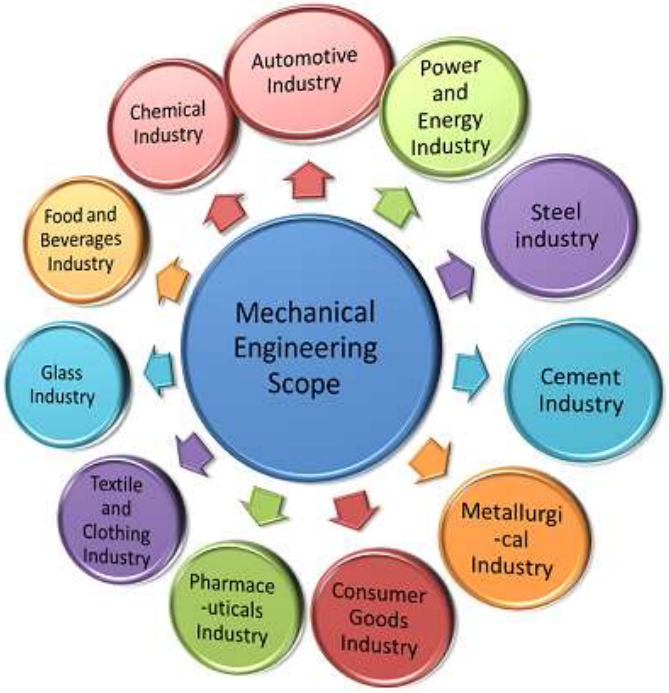
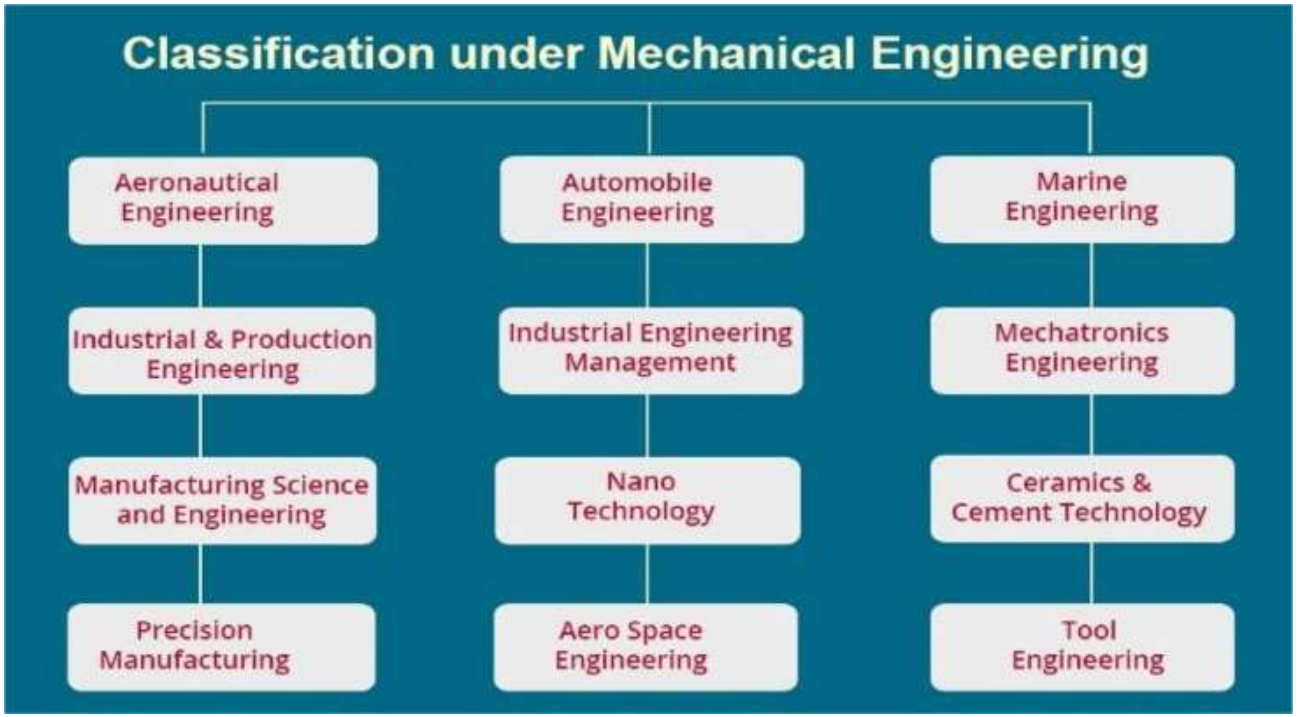
- Computer engineering is a branch of computer science and electrical engineering.
- This field of study combines several disciplines to design and develop software and hardware systems.



Mechanical Engineering

The engineering disciplines associated with machines and motion.





Manufacturing/ Industrial Engineering

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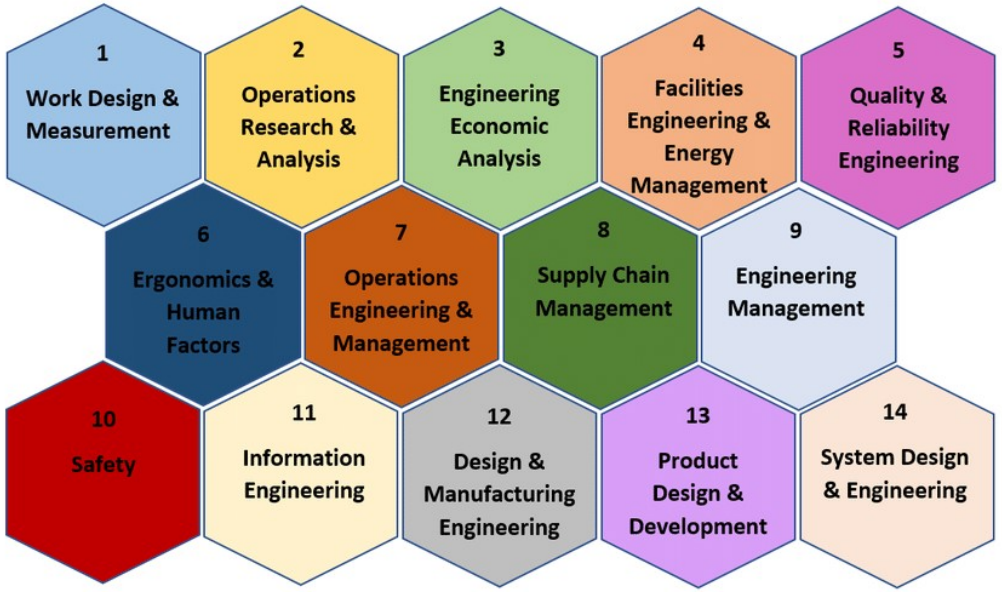
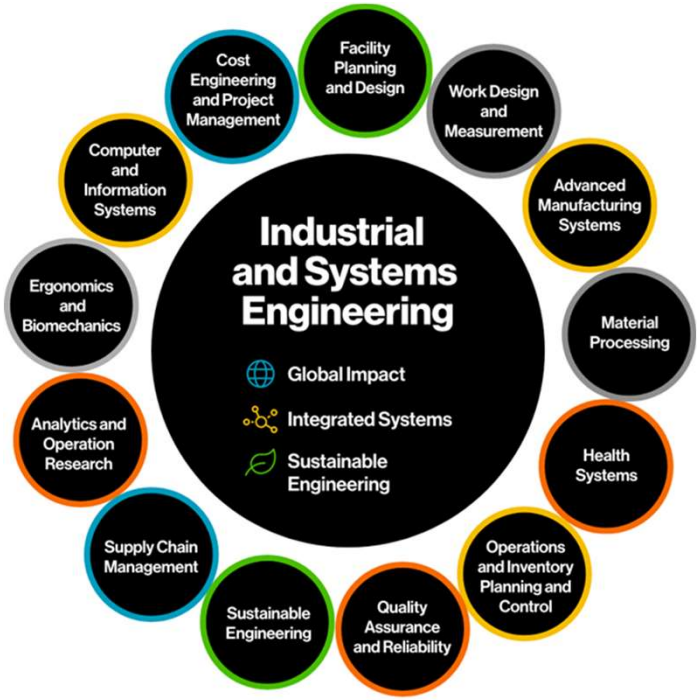
Manufacturing engineers are professionals who design, operate and maintain integrated systems and specialized machinery for producing consumer products and performing specialized manufacturing processes.

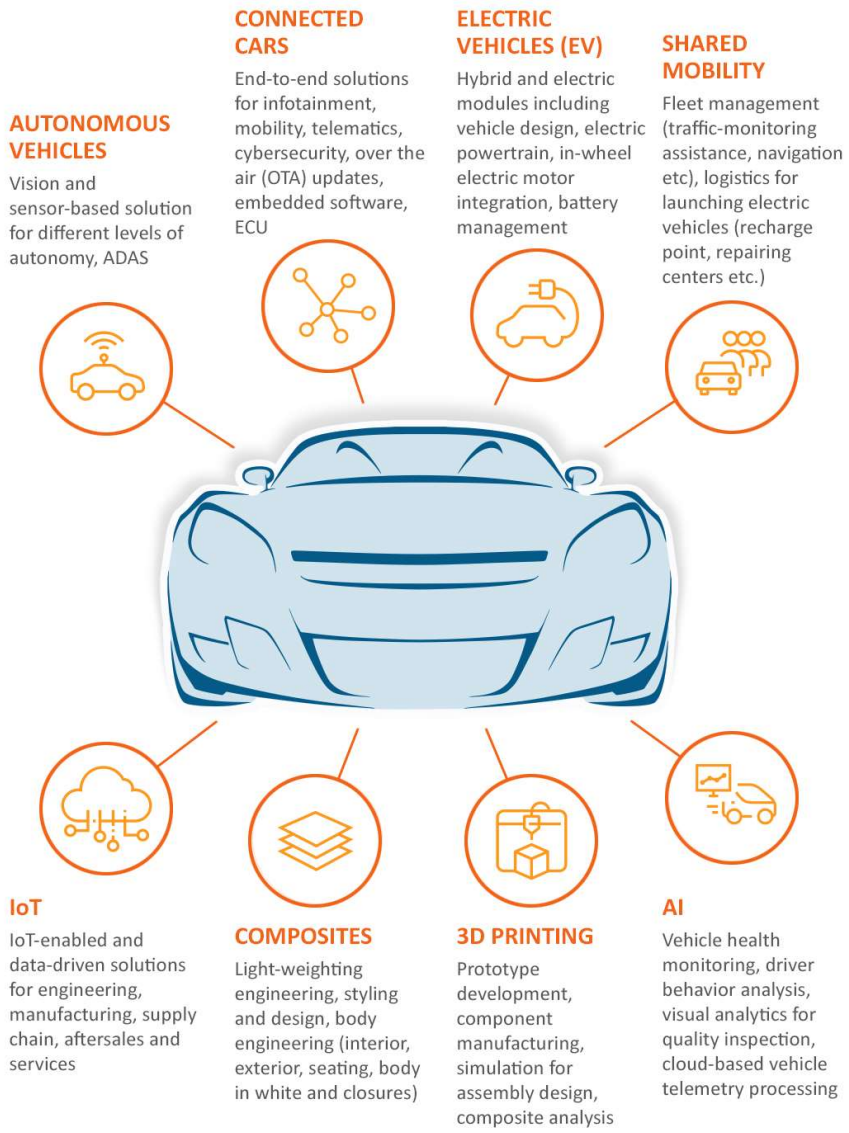
An industrial engineer is the professional in charge of developing approaches that improve processes within an organization.





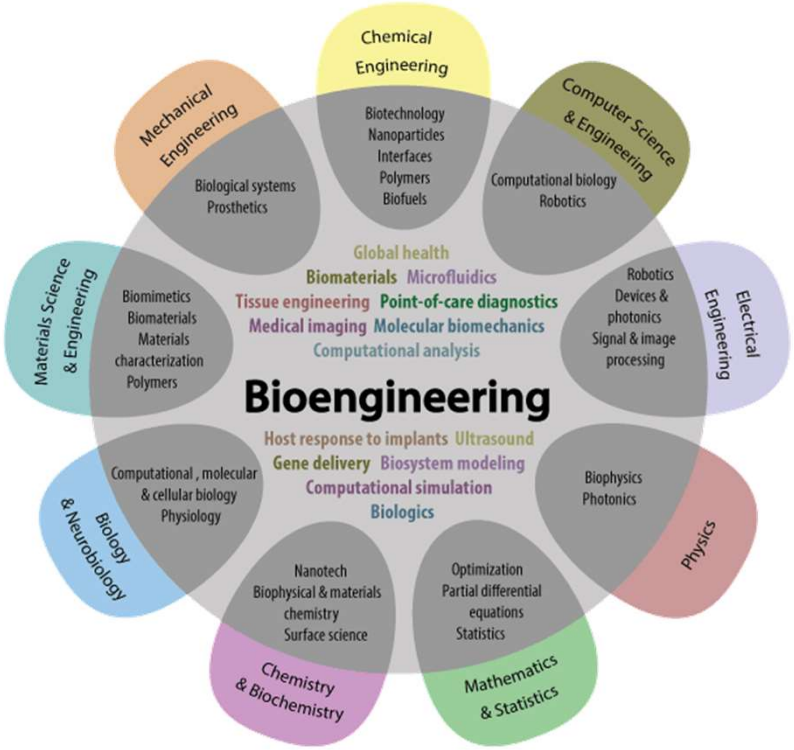
Automotive Engineering

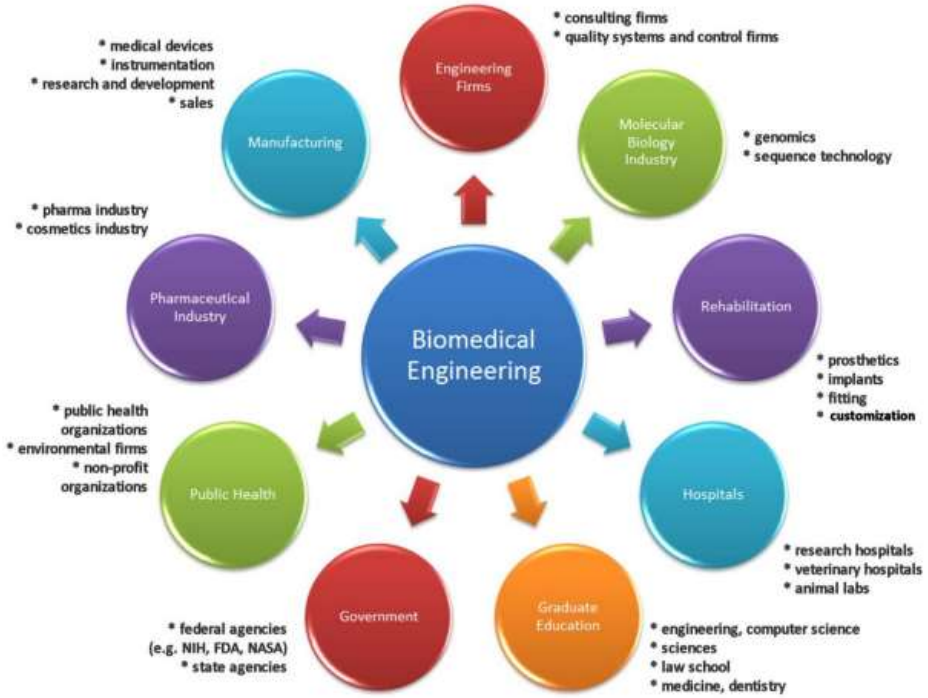
- Automotive engineering is one of the branches of vehicle engineering, along with aerospace engineering and naval architecture.
- It involves various elements such as mechanical, electrical, electronic, software, and safety engineering, which are applied to the design, manufacture, and operation of motorcycles, automobiles, and trucks, as well as their respective subsystems.
- The field also covers the modification of vehicles.



Biomedical Engineering

Biomedical engineers work to develop technologies that improve and maintain the physical and mental health of patients, including prosthetic limbs and surgical implants.





Systems Engineering

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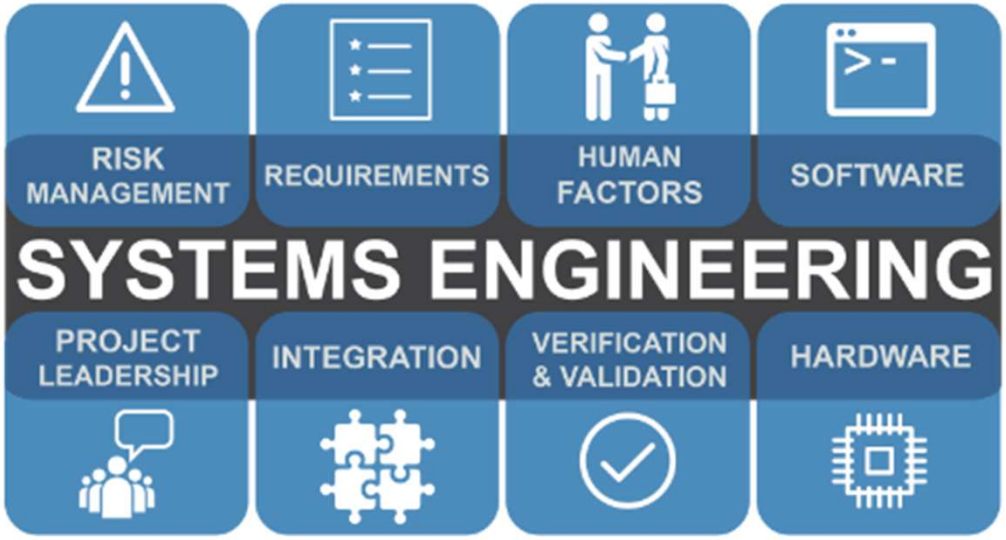
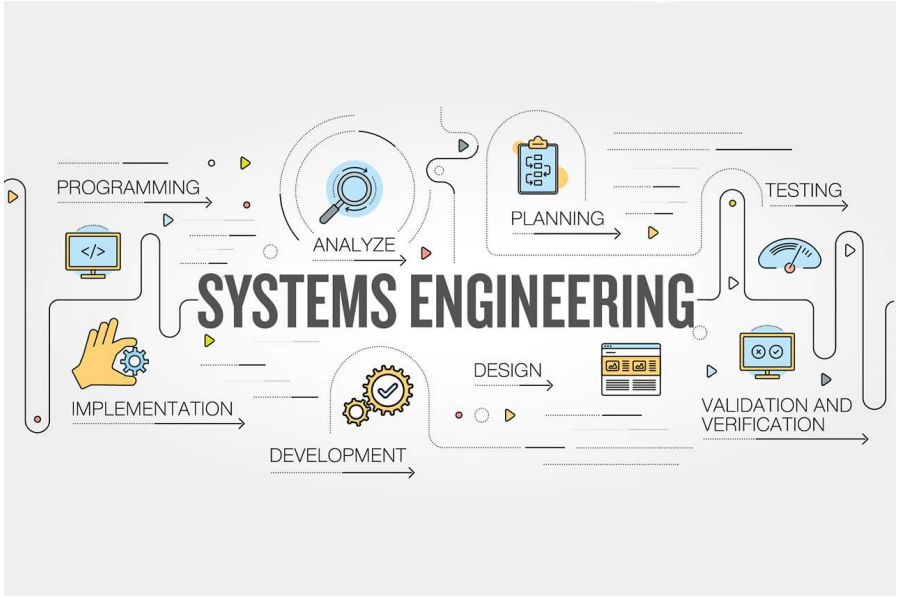
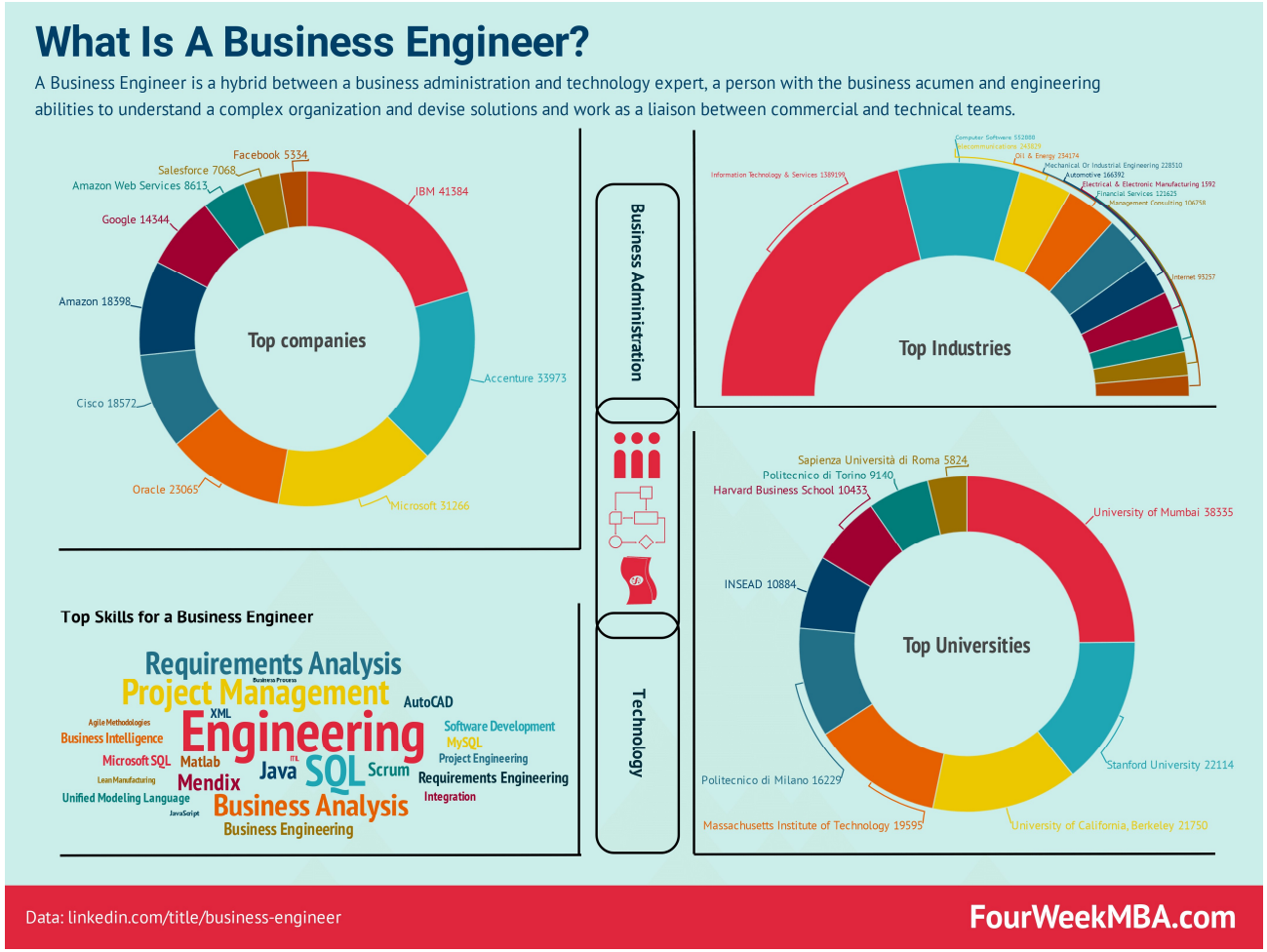
Systems engineering is an interdisciplinary approach governing the total technical and managerial effort required to transform a set of stakeholder needs, expectations, and constraints into a solution and to support that solution throughout its life.





Engineering Business Management



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Humanitarian Engineering

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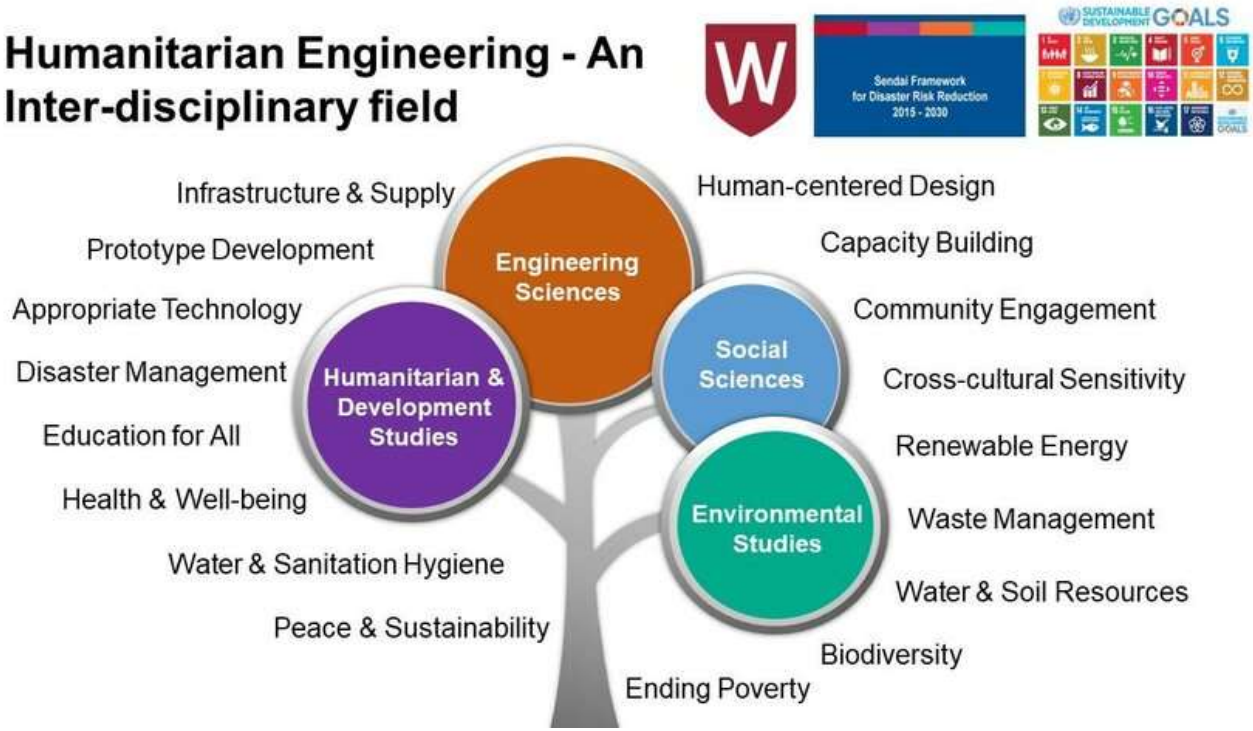
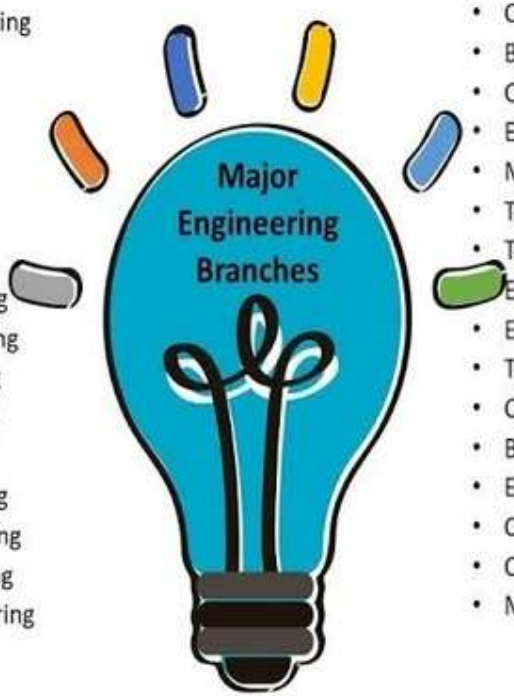
- Humanitarian engineering is the application of engineering for humanitarian aid purposes.

- Humanitarian engineering combines multiple engineering disciplines in order to address many of the world's crises and humanitarian emergencies, especially to improve the well-being of marginalized populations.



Summary

- Aeronautical Engineering
- Textile Engineering
- Mechatronics Engineering
- Civil Engineering
- Robotics Engineering
- Power Engineering
- Aerospace Engineering
- Mechanical Engineering
- Structural Engineering
- Industrial Engineering
- Marine Engineering
- Petroleum Engineering
- Automobile Engineering
- Production Engineering
- Metallurgical Engineering



- Ceramic Engineering
- Biomedical Engineering
- Construction Engineering
- Electronics Engineering
- Marine Engineering
- Tool Engineering
- Telecommunication Engineering
- Environmental Engineering
- Transportation Engineering
- Communications Engineering
- Biotechnology Engineering
- Electrical Engineering
- Computer Science Engineering
- Chemical Engineering
- Mining Engineering

What Kind of Problems Do Engineers Solve?

Civil Engineers solve problems with infrastructure and large structures.

- Bridges
- Buildings
- Highways

Electrical Engineers solve power generation/distribution problems.

- Electrical equipment
- Communications systems
- Power stations

Mechanical Engineers solve problems with systems in motion.

- Engines
- Turbines
- Robots

Biomedical Engineers solve clinical/ healthcare problems.

- Medical devices
- Surgical implants
- Prosthetics

Aerospace Engineers solve aircraft and spacecraft problems.

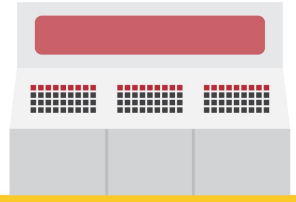
- Aviation systems
- Defense systems
- Rockets and fuel systems

Chemical Engineers solve problems with chemicals and materials.

- Plastics and polymers
- Medicines and food
- Petrochemicals

Environmental Engineers solve pollution and ecological problems.

- Systems that promote sustainability
- Waste disposal systems
- Pollution control mechanisms



Thank you for listening