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Engineering and Engineering Technology: What is the difference?

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INTRODUCTION

We live in the age of technology, when each year brings more amazing inventions. Most of these inventions and the corresponding explosion in knowledge are due to engineering and engineering technology. Engineering and engineering technology are related terms in our society. Careers in engineering and engineering technology are regarded as two different (but overlapping) paths. The high school student and the college student (who is about to graduate) may not know the difference. There is some uncertainty in the public mind as to what engineers and engineering technologist do. To fully understand the difference, we need to know what each term means.

Engineering

Engineering is the application of knowledge to create structures, machines, materials, systems, and processes. It is a profession in which knowledge of mathematics and science is applied to solve practical problems to benefit mankind. Engineers learn science, technology, engineering, and mathematics (STEM), which teach them how to pose problems, think logically, work methodically, and address complex problems from different angles. Engineers apply science and mathematics to develop solutions to technical problems. They are involved in design of new products, research and development, construction, and maintenance of facilities. Many engineers are self-employed and provide technical services as consultants, while some engineers are devoted to engineering education involving teaching and research. Engineering is a large profession with opportunities for energetic young men and women who like to "do things."

Engineering fields include:

- Aerospace engineering which deals with flight or other movement in space.
- Agricultural engineering which is concerned with food and animal production.
- Bioengineering that deals with designing health delivery systems.
- Chemical engineering which involves developing a process to solve a problem and designing a plant to carry out the process.
- Civil and environmental engineering which deals with the construction of highways, bridges, dams, and tall buildings.
- Computer engineering which designs computer hardware.
- Electrical and electronics engineering which designs electronic, communication and power systems
- Industrial engineering which is concerned with the design, improvement, and installation of integrated systems of people, materials, and energy.
- Manufacturing engineering which deals with methods of manufacturing and designing tools and equipment for manufacturing.
- Mechanical engineering designs machines using two fields of physics: mechanics and heat.
- Petroleum engineering involves the planning, development, and production of oil and gas fields.
- Software engineering deals with the design, development, and maintenance of software.

This rigid classification of engineering does not reflect reality, where applications require cross-pollination of multiple disciplines. For example, aerospace engineers need the knowledge of materials, electronics, computers, and software.

Engineers are devoted to technical advancement. Design is at the core of what engineers do. The great thing about engineering is that it allows you to be a creative designer. Applying creativity and innovation to produce something new is an exciting and rewarding process.

Engineering Technology

The word "technology" was first used to describe the ability of human beings to convert natural resources into tools for use. Engineering technology is concerned with the applications of engineering and modern technology, rather than the theoretical. Engineering technology is oriented toward application. Engineering technologists apply basic knowledge of mathematics

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and science to the operation of engineering systems. Technologists should not be confused with technicians. Technologists have college degrees, while technicians do not, although some have associate degrees. While technologists receive formal education in universities, technicians are trained in vocational-technical schools and community colleges. Technicians build up equipment, prepare and conduct experiments, and help engineers and technologists in many other ways.

The fields of engineering technology parallels those described above for engineering. By adding the word "technology" to each branch of engineering listed above, we obtain their corresponding engineering technology field, e.g. Aerospace engineering technology, Biotechnology, Electrical engineering technology, and Mechanical engineering technology. Engineering technology courses generally have labs associated with the courses that require hands-on applications of the topics being covered.

What is the difference?

The Accreditation Board for Engineering and Technology (ABET) describes the difference between engineering and engineering technology as follows: "Engineering and technology are separated but intimately related professions.... Engineering undergraduate programs include more mathematics work and higher level mathematics than technology programs.... Graduate from engineering programs is called engineers, while graduates of technology programs are often called technologists." These differences are illustrated in Figure 1. Engineering technology program covers the same topics as engineering program, but the knowledge is more applied, as opposed to mainly theoretical knowledge. The mathematics and basic sciences, as well as the technical courses, in technology programs are taught with more applications and less theory than related engineering courses. Engineering is more difficult than engineering technology, both to do and to explain, because it depends more on rigorous mathematics.

Since engineering technologists work closely with engineers, employment of engineering technologists is influenced by the same local and national economic conditions that affect engineers. Employers rely on engineers and technologists to increase productivity and sales. With new technologies, they are expected to analyze and improve products much more rapidly than before. Since engineers and technologists are expected to be familiar with the latest technology, they need to continue their education throughout their career. Up-to-date information on issues related to their career is available at various websites on the Internet, industry publications, professional associations, conferences, and personal contacts with industry.

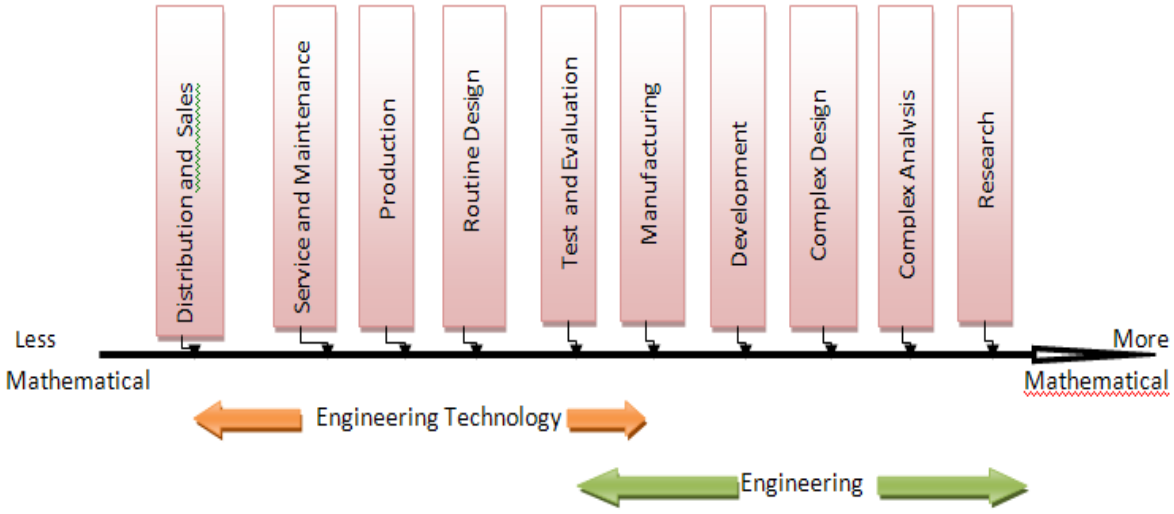

Figure 1: Engineering and engineering technology.

Conclusion

Engineering and engineering technology are both concerned the same technical issues ranging from design, development, construction through maintenance and operation. They are separate but closely related professional areas. It is hoped that this paper has clarified the differences between engineering and engineering technology.

Read More about It

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