

Engineering and Engineering Technology – a Comparison

Engineering and Engineering Technology – What is the difference? This question is asked repeatedly by graduating high school seniors who are considering the field of engineering as a career. They are told that engineering is science-oriented, stressing mathematics, natural and engineering science, engineering design, and the development of engineering research competencies. On the other hand, engineering technology is practice-oriented, stressing applications of engineering science, engineering design, and laboratory experience competencies. The potential student in engineering education is still confused because of the apparent overlap in the definitions. The student must understand that the field of engineering comprises a broad spectrum of occupations requiring different abilities, interest and skills. Both engineering and engineering technology are viable professional paths that lead to rewarding and successful careers. It is important for students to carefully assess their abilities, interests and personal career objectives before deciding between engineering and engineering technology. The student should study the following comparisons in order to decide which career path best fits his or her abilities and interests. All too often, graduating high school seniors enroll in engineering curriculums without realizing there is another alternative in which they could be more successful, during both academic preparation and the career that follows.

The comparisons that follow were taken in part from a brochure, “Mechanical Engineering and Mechanical Engineering Technology, Which Path Will You Take,” published by the American Society of Mechanical Engineers.

Engineering

Engineering Technology

Program Guide Characteristics

An innovator - one who is able to interweave a knowledge of advanced mathematics, the natural and engineering sciences, and engineering principles and practices with considerations of economic, social, environmental, and ethical issues to create new systems and products. The ME graduate can develop new procedures to advance the state of the art.

A doer or implementer - one who is able to apply a basic knowledge of mathematics, the natural and engineering sciences, current engineering practices, and an understanding of economic principles to the solution of design problems and to the operation or testing of engineering and manufacturing systems. The MET graduate can apply established procedures which utilize the current state of the art.

Program Objectives

To provide the knowledge necessary to design and manufacture state-of-the-art products and systems needed to meet the current and future needs of society. To provide the knowledge required to apply state-of-the-art techniques and designs to meet the current needs of society.

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Program Emphasis

Emphasis is on developing methods of analysis and solutions for open-ended design problems.

Emphasis is on applying current knowledge and practices to the solution of specific technical problems.

Expertise Objectives

To develop conceptual abilities.

To develop application abilities.

Program Length

Four years.

Four years. Transfer students from community colleges may take longer if they do not have basic math and science courses in freshman and sophomore years.

Courses in Major Field

Engineering students usually do not begin major field of study until the latter part of sophomore year or junior year.

Engineering technology students begin major field of study in the freshman year.

Degrees Awarded

B.S. in Engineering

B.S. in Engineering Technology

Academic Terminology

Graduates are referred to as engineers.

Graduates are referred to as engineering technologists. Job titles after entering industry will be “engineers” more often than not.

Program Basis

The equivalent of one full year of mathematics and basic science courses provides the foundation for the program that is calculus based.

The equivalent of three-quarters of a year of mathematics and basic science. Engineering Technology programs are algebra-based, but calculus usage is required. Calculus is required as a subject in

Emphasis of Technical Courses

Engineering courses stress the underlying theory of the subject matter.

Technology courses stress the application of technical knowledge and methods in the solution of current industrial type problems.

Emphasis of Laboratory Courses

Laboratory courses provide an intensive overview of experimental methods and of the related underlying theories.

Laboratory courses, an integral component of ETECH programs, stress practical design solutions as well as manufacturing and evaluation techniques appropriate for industrial type problems.

Technical Design Emphasis

General design principles, applicable to a wide variety of problem situations, are developed.

Current design procedures of a complex but well-established nature are developed and applied to problems in a specialized technical area.

Transfer Potential

Transfer to a technology program from an engineering curriculum is possible with a minimum loss of credits and time.

It is generally not possible to transfer to an engineering curriculum from a technology program without a significant loss of credits and time.

Typical Aspirations of the New Graduate

The engineering graduate entering industry would most likely aspire to an entry-level position in conceptual design, systems engineering, manufacturing, or product research and development.

The ETECH graduate entering industry would most likely aspire to an entry-level position in product design, development, testing, technical operations, or technical services and sales.

Technical Interest

The engineering graduate is relatively broad and has an analytical, creative mind challenged by open-ended technical problems.

The ETECH graduate is relatively specialized and has an applications orientation, challenged by specific technical problems.

Adaptability to Current Industrial Practices

An engineering graduate typically requires a period of "internship" since engineering programs stress fundamentals.

The ETECH graduate is prepared to immediately begin technical assignments since technology programs stress current industrial practices and design procedures.

Mobility

Many engineers move into management positions.

The majority of engineering technologists move into industrial supervisory positions. Many move into management positions.

Professional Registration

Graduates of engineering schools are eligible to become registered professional engineers in all states by a process of examination and documentation of experiences.

Graduates of engineering technology schools may become professionally certified in their specific areas of expertise. Technologists may become registered professional engineers in many states; however, the requirements are usually different than those for engineers.

National Accreditation

Accredited by the Accreditation Board for Engineering and Technology – Engineering Accreditation Commission (EAC of ABET.)

Accredited by the Accreditation Board for Engineering and Technology – Technology Accreditation Commission (TAC of ABET.)

Graduate Education Opportunities

Graduate study in engineering as well as other areas is available for qualified students having a B.S. in engineering.

Graduate study in technology is limited to a few universities and entrance to graduate engineering programs is most often difficult. Advanced degrees in technical education and business are possible.