MECHANICAL ENGINEERING

 WHICH PATH WILL YOU TAKE?

The term "mechanical engineering" refers not only to a specific profession, but also to a spectrum of occupations and challenges that lie within the broad field of engineering. Mechanical engineering comprises a wide range of activities, including research, development, design, testing, manufacturing and production, operations and maintenance, and marketing and sales. The many areas within the scope of mechanical engineering include transportation, power generation, energy conversion, climate control, machine design, manufacturing and automation, and the control of engineering systems, subsystems and their components.

There are many ways to participate in mechanical engineering activities and not all positions require the same temperament or educational preparation. The most common paths to these careers are through college level programs in mechanical engineering (ME) and mechanical engineering technology (MET). The spectrum of occupations provides employment opportunities for those with associate and bachelor's degrees in mechanical engineering technology, in addition to those with bachelor's, master's, and doctorate degrees in mechanical engineering. Furthermore, the scope of mechanical engineering continues to widen as the acceleration of technological development continues and mechanical engineers engage more and more in activities involving interfaces with other disciplines.

The purpose of this brochure is to contrast several aspects of mechanical engineering and mechanical engineering technology programs and careers. Both options represent viable professional paths, and it is important for students to carefully assess their abilities, interests, and personal career objectives before selecting a specific program.
# General Overview

| Program Graduate | 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. |
| Program Objective | 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. |
| Program Emphasis | Emphasis is on developing methods of analysis and solutions for open-ended design problems. |
| Expertise Objective | To develop conceptual abilities. |
| Program Length | Four years. |
| Degree Awarded | Bachelor of Science in Mechanical Engineering |
| Academic Terminology | Graduates are referred to as engineers. |

| Program Characteristics |

| Program Basis | The equivalent of one full year of mathematics and basic science courses provides the foundation for the program that is calculus based. |
| Emphasis of Technical Courses | Engineering courses stress the underlying theory as well as current and potential applications in business and industry. |
| Emphasis of Laboratory Courses | Laboratory courses provide intensive work in experimental methods and the related underlying theories. |
| Technical Design Emphasis | General design principles and tools applicable to a wide variety of new problem situations are heavily stressed. |
| Transfer Potential | Transfer to a technology program from an engineering curriculum is possible with a minimum loss of credits and time. |

| MET Programs |

| Program Graduate | 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 Objective | To provide the knowledge required to apply state-of-the-art techniques and designs to meet the current and future needs of society. |
| Program Emphasis | Emphasis is on applying current knowledge and practices to the solution of specific technical problems. |
| Expertise Objective | To develop application abilities. |
| Program Length | Associate Programs: Two years. Baccalaureate Programs: Four years or two years if an associate degree program is first completed. |
| Degree Awarded | Associate Programs: Associate of Engineering Technology or Science. Baccalaureate Programs: Bachelor of Technology, Engineering Technology, or Science. |
| Academic Terminology | Associate Programs: Graduates are referred to as engineering technicians. Baccalaureate Programs: Graduates are referred to as engineering technologists. |

| Program Basis | Associate programs and baccalaureate programs require the equivalent of one-half of a year and three-quarters of a year, respectively, of applied courses in mathematics and basic sciences. Although both programs are algebra based, calculus usage is required at both levels. |
| Emphasis of Technical Courses | Technology courses stress application of current technical knowledge and methods in the solution of current business and industrial problems. |
| Emphasis of Laboratory Courses | Laboratory courses, an integral component of MET programs, stress practical design solutions as well as manufacturing and evaluation techniques appropriate for industrial type problems. |
| Technical Design Emphasis | Current design procedures of a complex but well-established nature are developed and applied to problems in a specialized technical area. |
| Transfer Potential | It is generally not possible to transfer to an engineering curriculum from a technology program without a significant loss of credits and time. |
## CAREER OPPORTUNITIES

### ME PROGRAMS

**Typical Aspirations of the New Graduate**

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

**Technical Interest**

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

**Adaptability to Current Industrial Practices**

A ME graduate may require a period of “internship” since engineering programs stress fundamentals.

**Mobility**

Many MEs move into management positions.

**Professional Registration**

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

**Graduate Education Opportunities**

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

### MET PROGRAMS

**Typical Aspirations of the New Graduate**

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

**Adaptability to Current Industrial Practices**

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

**Mobility**

METs can move into industrial supervisory positions.

**Professional Registration**

Technicians and technologists 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.

**Graduate Education Opportunities**

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

---

## ASME GUIDANCE & CAREER DEVELOPMENT RESOURCES

**Sloan Career Cornerstone**

[www.careercornerstone.org](http://www.careercornerstone.org)

This site is a comprehensive education networking, job-hunting, and career planning resource center for those pursuing careers in engineering, mathematics, information technology, and the physical sciences.

**Free Downloadable Videos**

[www.asme.org/education/guidance](http://www.asme.org/education/guidance)

Visit our website to view free downloadable videos: Careers in Mechanical Engineering, Great Achievements in Mechanical Engineering, Mothers of Invention, and Engineering is for Everyone.

**ASME Scholarships, Loans & Fellowships**

[www.asme.org/education/enged/aid](http://www.asme.org/education/enged/aid)

ASME awards over $400,000 annually in low-interest student loans, scholarships and fellowships to ASME student members.

**The Student Center**

[www.asme.org/students](http://www.asme.org/students)

The Student Center has career resources, contest and competition information, e-mentoring opportunities, as well as various on-line publications for engineering students.

**Professional Practice Curriculum (PPC)**

[www.professionalpractice.asme.org](http://www.professionalpractice.asme.org)

The ASME PPC is a free on-line program of study for engineering students and early-career engineers that will supplement the formal college/university engineering curriculum.

**ME Department Websites**

[www.asme.org/education/dn/me/melist.htm](http://www.asme.org/education/dn/me/melist.htm)

This site links directly to mechanical engineering departments at over 600 colleges/universities around the world.

**ABET Accredited Programs**

[www.asme.org/education/enged/abet](http://www.asme.org/education/enged/abet)

This site lists accredited engineering, engineering technology, computing, and applied science programs in the U.S.

---

**Complete List of Resources**

[www.asme.org/education/guidance](http://www.asme.org/education/guidance)

To order any of our resources:

Phone: 800-THE-ASME (800-843-2763)
Fax: 973-882-1717
Email: infocentral@asme.org
Mail: ASME Service Center, 22 Law Drive, Box 2900, Fairfield, NJ 07007-2900

---

**MP4998**

8/3 10K