OVERVIEW

GENERAL

GRADUATES

ME graduates are innovators – 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 – in order to create new systems and products. The ME graduate can develop new procedures to advance the state of the art by combining their knowledge of physical components and systems with analytical methods to predict their performance.

MET graduates are doers, implementers and problem solvers – they also apply mathematics, the natural and engineering sciences, engineering principles, current engineering practices, environmental and ethics, to solve design problems big and small, and to the operation and performance testing of mechanical systems.

PROGRAM OBJECTIVES

ME program objectives provide the knowledge necessary to design, analyze, and create new products and systems needed to meet the current and future needs of society. Students are educated to design, analyze, and prototype new products and processes.

MET program objectives provide the knowledge necessary to apply state-of-the-art techniques to design, build and implement products and systems to meet the current and future needs of society. Students are educated to design and build prototypes, and to develop and scale-up a product or process.

PROGRAM EMBRASIS

ME programs emphasize design, simulation, analysis, and prototype of products or systems.

MET programs emphasize the development of state-of-the-art solutions for open-ended design problems.

EXPERTISE OBJECTIVE

The ME expertise objective is to develop engineering analysis abilities.

The MET expertise objective is to develop engineering analysis abilities.

OCCUPATION DESIGNATION

ME graduates are referred to as engineers.

MET bachelor degree graduates are referred to as engineers by most companies, though some companies use the title engineering technologists. Graduates of MET associate degree programs are referred to as engineering technicians, junior engineers, or engineering assistants.

MOBILITY

Both ME and MET graduates can move from their engineering disciplines into design, product development, production, project management, sales, customer support positions, supervision or management. ME graduates have the additional preparation to move into research and sophisticated technical analysis positions. In both cases, career progression is more a function of the individual’s motivation, dedication, personal skills and abilities than the bachelor’s degree they earned. Individuals with the associate degree are more limited in career progression but may progress into first level supervisory positions.

TRANSFER POTENTIAL

It is possible for MET students to transfer to ME programs, sometimes without loss of credits. ME students may transfer to MET programs with minimum loss of credits and time, although additional laboratory credits may be needed. Any loss of credits or extra time required depends on the particular ME/MET program, institution, and student level (e.g., freshman or sophomore). These arrangements can be quite variable, even between ABET accredited programs.

PROGRAM CHARACTERS

TECHNICAL COURSES

Typical ME courses stress the underlying theory and analysis techniques as well as current and potential engineering design applications.

Typical MET courses stress application of current engineering knowledge and design methods in the solution of open-ended design problems.

LABORATORY COURSES

In both MET and ME laboratory courses are a significant, and integral component of the programs. They are designed to develop student competence in the application of experimental methods and to provide the physical bridge between physical principles and theories and the actual complexities and behavior of solid, fluid, and thermal systems.

TECHNICAL DESIGN COURSES AND EMPHASIS

The ME emphasis is on general design principles and analysis tools applicable to a wide variety of emerging and even break-through problem solutions.

The MET emphasis is on the application of engineering design standards and procedures to complex contemporary problems.

Both ME and MET focus on hands-on design experiences using real-world industry problems and sometimes student design competitions. Although almost all design work is done in teams, both ME and MET programs, special opportunities can exist in ME programs for independent research-based design development studies.

PATHWAYS TO CAREERS

MECHANICAL ENGINEERING

ENGINEERING TECHNOLOGY EDUCATION

ASME ORG
A Mechanical engineering education is a great pathway to begin a rewarding career solving problems to help make people’s lives better and more productive. It not only prepares you for an engineering career but also can serve as a valuable foundation for leadership and careers in any number of areas – industry, healthcare, education, public service and even politics.

Mechanical engineering plays a critical role in solving the world’s grand challenges by producing sustainable energy, providing a safe environment, and improving our lives through intelligent transportation systems, designing new means of energy conversion and storage, improving manufacturing, and improving medical/healthcare systems and homes and buildings. Emerging high technology fields of nanomaterials and nanotechnology exemplify the importance of modern mechanical engineering plays a vital role. Furthermore, established areas of mechanical engineering such as design, manufacturing, automation, and control are essential elements to designing large-scale complex systems that drive the global economy.

This wide variety of careers and specialties— from medicine, to automation, to energy, to aerospace — welcomes individuals with different interests and aptitudes. Mechanical engineers are not all alike, nor are the many educational paths you may choose to get there. You may want to pursue a 2-year degree or a 4-year degree. You may wish to focus on hands-on, practical solutions to problems, or you may want to focus on a combined hands-on/approach (see theory and analysis. And after you complete your first level of education, you may wish to continue, from Associate Science (A.S.), to Bachelor of Science (B.S.), Masters of Science (M.S.), or Doctorate (Ph.D.) levels.

The most common paths to careers in mechanical engineering (ME) are through college-level programs in mechanical engineering (ME) and mechanical engineering technology (MET). These provide the employment opportunities for degree-holders in both fields, starting with 2-year A.A.S. programs in Engineering Technology, through Ph.D. programs in Mechanical Engineering (see diagram). The mechanical engineering spectrum is wide as technological development accelerates and professionals interface with other disciplines. That’s why there continues to evolve and pursue further degrees even after they’ve started working, depending on their workplace needs or specialties.

This brochure compares both mechanical engineering (ME) and mechanical engineering technology (MET) programs that are accredited or recognized by the international agency overseeing the accredited for engineering programs known as ABET, Inc. Both options represent viable professional paths — it is important for students to carefully assess their interests, personal objectives, and abilities, before selecting a program. These different educational paths better prepare students for different entry points into the Mechanical Engineering career spectrum, shown in this brochure.

**WHICH PATH WILL YOU TAKE?**

ME programs are four years (or a minimum of 120 semester credits), sometimes at a community college, 2-year, pre- engineering program together with transfer to the upper-level baccalaureate program at a university. The MET programs are two types, bachelor degree programs that are four years (or a minimum of 120 semester credits) at universities, and associate degree programs that are two years (or a minimum of 60 semester credits) found at community colleges or community universities or branch campuses.

MET programs award a Bachelor of Science in Mechanical Engineering or similar title. ME degrees depend on the length of the program. A 4-year degree program awards a Bachelor of Science in Mechanical Engineering Technology or similar title. 2-year degree programs award an Associate of Science in Mechanical Engineering Technology or similar title.

**PATHWAYS INTO THE ENGINEERING WORKFORCE.**

**ME CAREERS IN ENGINEERING AND RELATED FIELDS**

ME programs are for students who most likely assume entry- level design or manufacturing positions in product design, performance evaluation, manufacturing, technical sales/customer service. ME graduates entering industry from an Associate of Science program likely assume engineering technician positions in maintenance, production, or product development.

**MET CAREERS IN ENGINEERING AND RELATED FIELDS**

MET graduates entering industry most likely assume entry-level positions in design, production, or product development, or technical sales/customer service. Many ME graduates also directly enter graduate studies in engineering or other professional degree programs to expand their knowledge and career directions.

**TECHNICAL INTERESTS**

Typical MET graduates are applications-oriented and are prepared to design and develop creative solutions to a wide variety of open-ended problems.

Typical MET graduates are applications-oriented and are prepared to solve specific and defined engineering problems in industry.

**ADAPTABILITY TO CURRENT INDUSTRIAL PRACTICES**

MET programs stress current industrial design practices that allow students to start developing practical workplace skills.

During the course of a degree program, however, students in both ME and MET can greatly benefit from the summer internship or co-op opportunity provided by many companies. These allow students to gain workplace experience, and, to learn, or at least, how they apply engineering principles to practice.

**IF SOMETHING MOVES OR USES ENERGY TO MAKE IT MOVE**

A mechanical engineer was probably involved in its design or production.

**CAREER OPPORTUNITIES**

ME graduates entering industry most likely assume entry-level design or manufacturing positions in product design, performance evaluation, manufacturing, technical sales/customer service. Many ME graduates also directly enter graduate studies in engineering or other professional degree programs to expand their knowledge and career directions.

MET graduates entering industry from an Associate of Science program likely assume engineering technician positions in maintenance, production, or product development.

**ADVISABLE PROFESSIONAL REGISTRATION & CERTIFICATION**

Metallurgical engineers from ABET accredited degree programs are eligible to become registered professional engineers (P.E.) in all U.S. states and territories by a process of two examinations (the FE and PE exams) and documentation of engineering work experience. This registration is commonly known as the PE License.

MET graduates from ABET accredited baccalaureate programs are also eligible to become registered professional engineers by the same process in many but not all states.

About one-third of mechanical engineers hold PE registration which allows them to work in “responsible-charge” positions in certain public work/utility companies or in private consulting practice. A variety of other technical certifications are offered by various technical/professional societies and other organizations, but these are not licenses to independently practice engineering.

Both ME and MET graduates can work to become certified in specific sub-areas of technical and business expertise.

**ASME GUIDANCE AND CAREER DEVELOPMENT RESOURCES**

SLOAN CAREER CORNERSTONE

www.careercornerstone.org

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

ASME SCHOLARSHIPS, LOANS & FELLOWSHIPS


ASME awards over 50,000 annually in low-interest student loans, scholarships and fellowships to ASME student members.

PROFESSIONAL PRACTICE CURRICULUM (PPC)

www.professionalpractice.asme.org

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

**ME DEPARTMENT WEBSITES**

http://www.asme.org/career-development/educational-resourses/ student-engineers

This site lists accredited engineering, engineering technology, computing, and applied science programs around the world.

**ABET ACCREDITED DEGREE PROGRAMS**

www.abet.org

This site lists accredited engineering, engineering technology, computing, and applied science programs around the world.

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