ENGINEERING RESOURCES

SLOAN CAREER CORNERSTONE
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.

ENGINEERING FOR CHANGE (E4C)
https://www.engineeringforchange.org/home

See how engineers are finding solutions to challenges in the developing world, and sharing their stories every day

ASME SCHOLARSHIPS, LOANS & FELLOWSHIPS
http://www.asme.org/about-asme/scholarship-and-loans/asme-financial-aid-for-students

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

COMPLETE LIST OF ASME PRE-COLLEGE RESOURCES
www.go.asme.org/precollege

Free brochures, classroom activity guides and other resources for elementary, middle, high school and college ages.

TO ORDER ANY OF OUR RESOURCES:

PHONE: 1.800.THE.ASME (1.800.843.2763)

FAX: 1.973.882.1717

EMAIL: infocentral@asme.org

MAIL: ASME Service Center
22 Law Drive, Box 2900
Fairfield, NJ 07007-2900

ASME FOUNDATION

national engineers week foundation

THAT'S ENGINEERING

Who designs the things that make the world a better place, help people in need, and help society confront its greatest challenges – of energy, safe water, and transportation?

Who will design the ultra-miniature machines and tiny implantable medical devices of the future that navigate the human body to search for disease and save lives?

And who makes it possible to enjoy the things we take for granted everyday – from your your cellphone, IPod, and computer, to roller blades, surfboard, or favorite video game?

The fact is, engineers are responsible for virtually everything you see or use during the course of your day. For all the challenges and cool solutions mentioned above, chances are a mechanical engineer had, or will have, something to do with it.

IF SOMETHING MOVES OR USES ENERGY, A MECHANICAL ENGINEER WAS PROBABLY INVOLVED IN ITS DESIGN OR PRODUCTION.

ENGINEERS KEEP EVOLVING — AND INVENTING

"I love that I get to influence the world around me. I transform ideas into pictures, and then those pictures are transformed into buildings, structures and finally a plant appears on what, just a year back, was an empty hillside. I'm involved in every step of the process so I get to see the project come to life. It's so real! I like the fact that my department is small enough so that I can take on big responsibilities early on, but big enough that we get to work on major projects."

– Rhea Naidoo
Junior Mechanical Project Engineer
Xstrata Projects Chrome Division, South Africa

ASME.ORG

WHAT IS A MECHANICAL ENGINEER?

Mechanical engineers create and develop mechanical systems for all of humankind. Concerned with the principles of force, energy and motion, mechanical engineers use their knowledge of design, manufacture, and operational processes to advance the world around us – enhancing safety, economic vitality and enjoyment throughout the world.

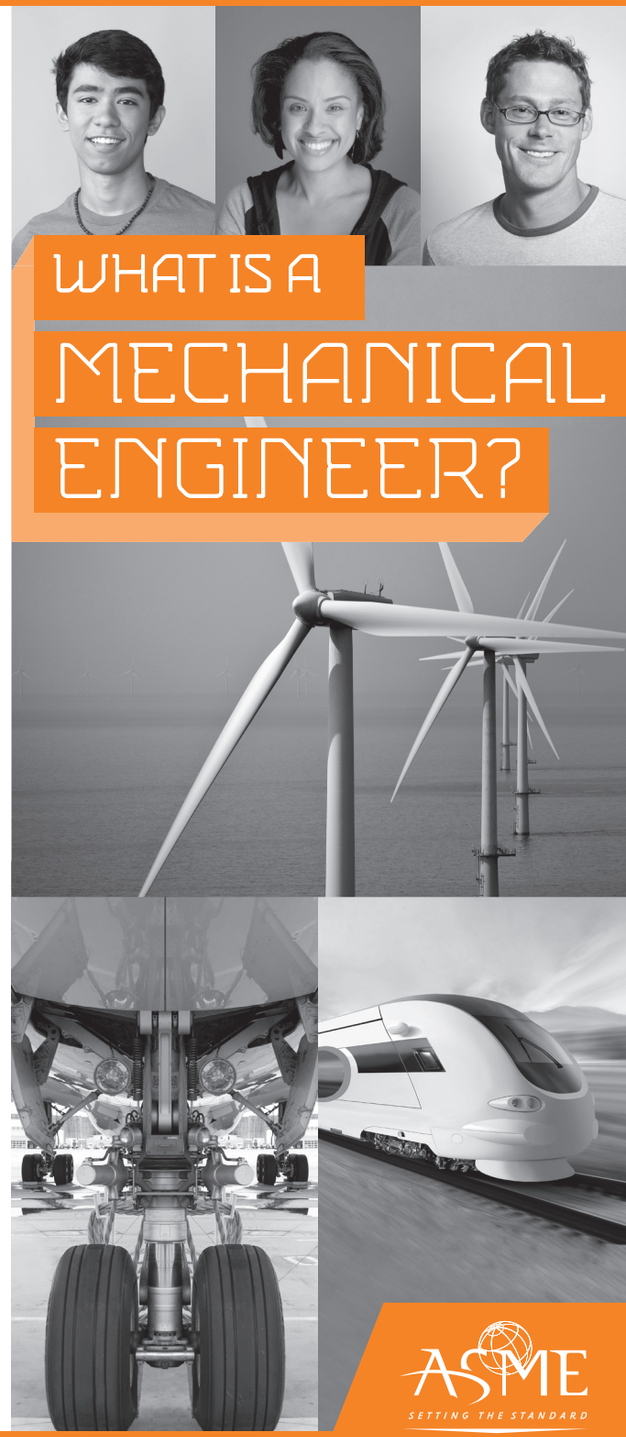
Not only do mechanical engineers help design everything from athletic equipment, medical devices and personal computers to air conditioners, automobile engines and electric power plants, they also design the machines that produce these innovations. Virtually every aspect of life is touched by mechanical engineering. Spanning multiple industries, the career opportunities for mechanical engineers are diverse and found worldwide throughout thousands of companies ranging from large multinational to small local firms.

- Aerospace
- Automotive
- Bio-technology
- Chemical
- Computers
- Construction
- Consumer products
- Energy
- Electronics
- Engineering consulting
- Entertainment
- Government
- Nano-technology
- Robotics

MECHANICAL ENGINEERS AS INNOVATORS AND ENTREPRENEURS

"I earned my degrees in Engineering and Environmental Science and started out as a product design engineer, learning how things are made. Then at age 28, I founded BioLite to develop clean energy access products for off-grid communities around the world. The BioLite HomeStove, for example, cuts toxic indoor smoke by 95% while generating electricity to charge mobile phones and LED lights. Engineering is how what could be becomes what is."

– Jonathon Cedar, CEO/chief product design engineer
BioLite Stoves, Brooklyn, New York



ASME
SETTING THE STANDARD

WHY ENGINEERING?

Engineers are natural problem solvers, and right now there's no shortage of real world challenges to address. Over the past 50 years, the world's population has more than doubled - from 3 billion in 1960 to nearly 7 billion people today. This population explosion is causing new and untold stresses on our man-made and natural systems, forcing us to do more with less resources – but with more ingenuity.

For that reason, there's never been a better time to become an engineer. Engineering is not only where the high-paying jobs of the future are, it's also an opportunity to combine purpose and passion with your paycheck. That's why, for many, engineering is more than just a career, it's a calling – to making a lasting contribution to creating a smarter, more sustainable future.

SEEING YOUR IMPACT FIRST-HAND

"I grew up during the NASA Space Shuttle era and like most people my age, I wanted to be an astronaut. I wanted to work for NASA. It inspired me to take high level math and science classes in high school and pursue programs that would get me exposure to what engineering was all about. I never got the chance to work for NASA but I did work in the aerospace industry for three years and my parts fly in commercial and military planes to this day."

– Loretta McHugh, Quality Engineer
Henke Sass Wolf of America, Dudley, Massachusetts

NO CHALLENGE TOO BIG — OR TOO DEEP

"I am challenged on a daily basis to think outside the box and I absolutely love that. In my current job, the deadlines are the most challenging things—meeting them while trying to remain on the cutting edge is a big challenge. The most exciting part is seeing something I helped develop get deployed by the Army in theater. It is just amazing to sit back and think... they are using something I designed or worked on. That to me is rewarding and very, very cool!"

– Jeremiah Gayle,
Systems Engineer, Northrup Grumman, Huntsville, Alabama

MANY EDUCATIONAL PATHS

Successful engineers follow many educational paths. Some go right from high school into 4-year bachelors programs in Mechanical Engineering (ME). Others pursue 4-year degrees in Mechanical Engineering Technology (MET). These courses emphasize different skills, but their graduates can all find work as engineers, get licenses and pursue further education. Other paths to mechanical engineering work involve 2-year degrees, often followed by additional schooling. Graduates with bachelors' degrees in ME or MET can get master degrees in ME – and academics and high-level researchers in the field have ME PhDs. In addition, mechanical engineering graduates are strong candidates for further degrees in law, business, education and even public policy.

Mathematics is a fundamental language of a college or university engineering program. College students will also gain extensive integrated laboratory, computer and design experiences. Communication, teamwork and practical hands-on experience with various product design processes are other important elements of a program. Internships, co-op semesters and participation in ASME Student Section activities are strongly encouraged as means to gain exposure to engineering practice.

While mechanical engineering programs vary in specific content, they are linked by a common educational philosophy: A broad-based education with a concentration on fundamentals and basic laws are the major tools required for professional practice. Graduates are expected to work professionally, as individuals and in teams, in both the thermal and mechanical systems areas, including the design, manufacture and control of such systems. Moreover, they are expected to understand the ethical, legal and societal implications of their work.

Those seeking to pursue a mechanical engineering (ME) or mechanical engineering technology (MET) degree in the United States should look for a college curriculum accredited by ABET (Accreditation Board for Engineering and Technology). There are approximately 425 college and university mechanical engineering degree programs bearing ABET accreditation. In other countries, explore polytechnic and university programs recognized by governmental education authorities and that country's professional organization of mechanical engineers.

GUIDANCE MATERIALS

"For the last 5 years I have been working with various teams of architects and engineers in Venezuela, South Africa and Chile designing and developing buildings with sustainability criteria. Since 2009 I am in charge of a master program in energy efficiency and various undergraduate courses targeted to architects and building professionals to address energy consumption and seek ways to optimize its use. In this way, I am preparing new professionals not only to solve new challenges, but also to communicate and work efficiently with the rest of the design team for the same objectives."

– Timo Marquez, Project Manager
Educational Initiative, ETH Sustainability
Maracaibo, Venezuela

> "The problems that we face cannot be solved by the same level of thinking that created them."
> – Albert Einstein

GETTING AN EARLY START

"In high school, I was good at physics and math and I liked studying the principles behind machines and structures. That's what led me to study mechanical engineering at the University of Science and Technology of China. Sandia is a wonderful place to work. My job is primarily research based, but I have a lot of freedom. I can decide how to approach a problem and how to solve it. And I work with a team of people with expertise in many different areas."

– Helena Jin, Ph.D., Research Scientist
Sandia National Laboratories, Livermore, California

THERE ARE DREAMERS, THERE ARE DOERS, AND THEN THERE ARE BOTH. WE CALL THOSE PEOPLE "ENGINEERS."

A CHANGING WORLD, AN EVOLVING PROFESSION

In the 20th century, the explosive development and expansion in computer technology gave way to computer-aided-design (CAD) and sophisticated software tools which literally changed the face of mechanical engineering. Mechanical engineers could more easily develop efficient solutions to complex technical challenges.

Today, those technical challenges are far reaching. The entertainment industry relies on mechanical engineers in areas of sound production, special effects, amusement parks and theater equipment. Mechanical engineers are also joining forces with the life science professions and working in the medical and pharmaceutical fields. Nanotechnology in particular is making its mark on the profession, attracting engineers to design technology at 1-billionth of a meter. And as bioengineers, they're able to experiment with nanoparticles that could be made to isolate and kill cancer cells or to better treat Alzheimer's disease.

SCIENCE AND ENGINEERING INDICATORS REPORTS THAT BY 2012, U.S. OCCUPATIONS IN SCIENCE AND ENGINEERING FIELDS ARE EXPECTED TO GROW BY 1.25 MILLION OR 26 PERCENT.

In technologies old and new, the growing concern for the planet and the quality of life for future generations have spurred continuing efforts by mechanical engineers to develop equipment and processes to clean up existing environmental problems and prevent their recurrence. These technologies and a host of others will continue to have an impact on lives in the 21st century and beyond.

For all of these reasons, employment prospects for mechanical engineers are strong –particularly where local economies are growing and new technologies are emerging.

When you consider the average starting salary and average 10 year salary for mechanical engineering professionals, you simply need to do the math to realize why this is such a rewarding field on so many levels.