



# systems



## electrical

# software



# Aerospace



# I Want to Be an Engineer!



## nuclear



# Mechanical



# Welcome!

Are you good at math and science? Are you creative? Do you like solving puzzles? Are you curious about how things work? Do you want to make a difference in the world? If so, you might want to consider a future in engineering. Engineering offers the opportunity to do an amazing array of interesting things, earn a very good salary, work in different parts of the world, and even go out of this world—some engineers also become astronauts!

Engineers have had something to do with pretty much everything around you—from the building where you go to school; to the house where you live, to the clothes you wear, and the food you eat; to the things you do for fun. Some engineers even work on projects that help people stay safe or recover from illness.

While salaries for different types of engineers can vary, as a group they earn some of the highest average starting salaries among college graduates. In the coming years, many jobs will be available in the field of engineering, and opportunities are only expected to increase for the future engineers sitting in classrooms today.

In this brochure, you can find out more about engineering, what to do now to consider it as a career *later*, and learn about some of the engineering disciplines at Lockheed Martin. Headquartered in Bethesda, Maryland, Lockheed Martin employs about 140,000 people worldwide and is one of the leading systems and technology companies in the world. Lockheed Martin engineers work on exciting projects ranging from airplanes to spacecraft and the vehicles that launch them.

Throughout this brochure, you'll get a chance to meet some of those engineers up close and personal.

**It's a fact!**



Engineers don't just work on serious things like skyscrapers and space shuttles.

They work on fun stuff, too. An engineer designed the snowboard—and the rides at Disney World. And an engineer with degrees in both mechanical and nuclear engineering "accidentally" invented the Super Soaker® squirt gun!

# About Engineering



**E**ngineering is the largest of all the scientific and technical professions. In fact, among all professions, only elementary and secondary teaching employs more people. Engineering is also a very diverse profession. For example, at Lockheed Martin engineers work in a variety of different disciplines— aerospace, electrical, mechanical, nuclear, software, and systems engineering.

Because engineers work with leading-edge technology, their jobs are always changing in this exciting profession. The work they do is important and touches every aspect of our daily lives—from designing bridges and buildings; to making sure our water is clean; to ensuring we have power for heating and lighting; to space exploration and health care and global security; to equipping us with computers, iPod®s, cell phones, and video games.

One of the most important things you can do now to keep your career options open is to take the right courses in school—including algebra, geometry and

a foreign language. Every profession looks for well-rounded people, and engineering is no exception!

## It's a Fact!

**While earning his bachelor's degree in engineering at the University of Michigan, Larry Page built an inkjet printer out of Lego™ bricks. Enrolling later at Stanford**



**University in the Ph.D. program in computer science, he met Sergey Brin, who had a bachelor's degree in mathematics and computer science from the University of Maryland at College Park. Together, Page and Brin co-founded Google™ in 1998.**



**"Engineering is a great career for anyone. It gives a person a solid background that can be used as a springboard for almost any other career, including medicine, law and business."**

—Amanda Malm works for Lockheed Martin in Palmdale, California, as a senior systems engineer. She has a bachelor's degree in mechanical engineering from Kansas State University and a master's degree in business administration from Oglethorpe University.

# A World of Opportunity

Lockheed Martin employs engineers in a number of exciting and varied disciplines, or fields.

## → Aerospace Engineering

Aerospace engineers are the intellectual descendants of the Wright Brothers, who made aviation history in 1903 with the first powered airplane flight. Today, aerospace engineers design and develop some of the most exciting machines imaginable.

- Education: Bachelor's degree in aerospace engineering or a related field
- Salary range: \$56,000-\$115,000\*
- Products created by aerospace engineers include: aircraft, spacecraft, rockets

## → Electrical Engineering

There is very little that touches us in our daily lives that an electrical engineer did not have something to do with—from the generation, transmission and distribution of electrical power, to

computer hardware and consumer electronics.

- Education: Bachelor's degree in electrical engineering or a related field
- Salary range: \$47,000-\$110,000\*
- Products created by electrical engineers include: communications satellites, speakers, TVs, microwaves

## → Mechanical Engineering

If it's a machine—anything from the supersonic jet fighter engine to the kitchen toaster—a mechanical engineer was involved. In addition, almost anything that is mass-produced—from your pencil to your favorite candy bar—is made by machines that were designed by mechanical engineers.

- Education: Bachelor's degree in mechanical engineering or a related field
- Salary range: \$44,000-\$100,000\*
- Products created by mechanical engineers include: machines, engines, cars, snowmobiles



**"If I hadn't been an engineer, I would have been a wheelchair designer. Since I am a wheelchair rider, I have encountered many barriers in my life. I do not give up. I just move forward."**

—Omar Talavera (shown here working in the centrifuge facility) is a design engineer with Lockheed Martin in Moffett Field, California. He has a bachelor's degree in mechanical engineering from the University of California at Berkeley.

Photo courtesy of NASA Ames

## → Nuclear Engineering

Nuclear engineers work on practical applications that harness the power of nuclear energy and radiation. They work in nuclear power plants; they develop the fuels and components that power aircraft carriers and submarines, and they work with X-ray machines and other imaging equipment in medical centers.

- **Education:** Bachelor's degree in nuclear engineering or a related field
- **Salary range:** \$63,000-\$119,000\*
- **Products created by nuclear engineers include:** power plants, reactors, MRI machines, X-ray machines

## → Software Engineering

Software engineers deal with all aspects of computer systems. They design them, build them and operate them. They also develop the software systems that operate computers.

- **Education:** Bachelor's degree in software or electrical engineering or a related field

- **Salary range:** \$51,000-\$126,000\*
- **Products created by software engineers include:** computer programs that control automated robotic systems, aircraft and spacecraft guidance systems, video games, iPod®s

## → Systems Engineering

Systems engineers look at the big picture. They're the people who have to think about how all the components of a project will work together as a system. They work in teams with engineers from all the different disciplines involved in a project and deal with cost, scheduling, design, function, and even a project's social impact.

- **Education:** Bachelor's degree in systems engineering or a related field
- **Salary range:** \$44,000-\$113,000\*
- **Products created by systems engineers include:** water treatment systems, telecommunications systems, weather/environment systems

\*From *Career Opportunities in Engineering*, by Susan Echaore-McDavid and Richard A. McDavid (Checkmark Books, 2006)

**"All disciplines of engineering offer great career opportunities simply because there are so many to choose from. Everything you use on a day-to-day basis was somehow engineered before you bought it and brought it home. An engineering degree is very versatile and allows you to look for jobs in almost any area of interest."**

—Kimberly Quinlan works for Lockheed Martin in Gaithersburg, Maryland, as a senior project engineer. She has a bachelor's degree in electrical engineering from Purdue University and a master's degree in electrical engineering from the Florida Institute of Technology.



# What's Your Engineering KQ?

The field of engineering is full of amazing accomplishments and interesting people. How much do you know about them? Take this quiz and check your Knowledge Quotient (KQ)!

## True or False?

1. The Chesapeake Bay Bridge-Tunnel, which connects Virginia Beach, Virginia, with the Eastern Shore of Virginia, is one of the seven engineering wonders of the modern world.
2. Biomedical engineers work in research labs.
3. Civil engineers work in the judicial system.
4. Although engineering is not a new profession, college engineering programs have only existed for about the last 100 years.
5. Some engineers work in the clothing and textile industries.
6. Engineering is all about math and science, so those are the subjects that really count.
7. There are only about a dozen good engineering schools worldwide today.
8. It's very important to know what specialty you want to pursue before you enter a college engineering program.

**"My dad always told me to go to college and to be successful doing what I enjoy. I became interested in engineering while learning statics (a branch of physics) and computer-aided drafting."**



—Jorge Arturo Gudino works for Lockheed Martin in Palmdale, California, as a senior research engineer. He has an associate degree in science engineering from Los Angeles Mission College, and a bachelor's degree in manufacturing systems engineering and a master's degree in automation engineering from California State University-Northridge.

## Engineering KQ Answers

1. True. It consists of two bridges, two tunnels, four man-made islands, and 12 miles of trestle.
2. False. Some do, but others also work in colleges and universities, hospitals, manufacturers, industry, and government agencies.
3. False. Civil engineers design and build infrastructure—bridges, highways, rail and water systems, etc.
4. False. Early engineering schools include the U.S. Military Academy (est. 1824), and the University of Virginia (est. 1838).
5. True. Engineers are starting to weave computer threads in any one of them will provide a solid foundation.
6. False. Engineering schools are placing more emphasis on communication skills. The ability to speak and write well are just as important as math and science.
7. False. While some schools are better known than others, there are accredited schools of engineering in each of the 50 states in the U.S. and in other countries.
8. False. There are six basic engineering areas and each of the 50 states in the U.S. and in other countries.
9. False. Early engineering schools include the U.S. Military Academy (est. 1824), and the University of Virginia (est. 1838).
10. True. Engineering is full of amazing accomplishments and interesting people.

# Here's What You Can Do Now

There are lots of things you can do now to keep your career options open. Get involved in extracurricular activities and read and learn all you can about engineering as a career.

What about the cost of college? There are lots of ways to pay for an education—government grants, low-interest loans, scholarships, work-study programs, and ROTC—to name a few. Do your best now so you can take advantage of those opportunities in high school.

## → Activities and Competitions

Here are a few engineering-oriented activities that may be offered at your school. Ask your teacher or guidance counselor about them.

### ■ FIRST LEGO League

([www.usfirst.org](http://www.usfirst.org))—a robotics challenge for middle school students.

### ■ MATHCOUNTS®

([www.mathcounts.org](http://www.mathcounts.org))—a national math enrichment, coaching and competition program.

### ■ National Engineers Week

([www.eweek.org](http://www.eweek.org))—a week-long celebration plus competitions for students at all grade levels.

### ■ Science Olympiad

([www.soinc.org](http://www.soinc.org))—team-oriented science and technology competitions at the local, state and national levels.

### ■ Space Day ([www.spaceday.org](http://www.spaceday.org))—held each year on the first Friday in May, this event is dedicated to celebrating the exploration and use of space.

### ■ Team America Rocketry Challenge ([www.rocketcontest.org](http://www.rocketcontest.org))—teams of students build and fly model rockets; top scoring teams are invited to attend a national competition.

## → Scouting

The Boy Scouts offer an engineering Merit Badge. The Girl Scouts, in conjunction with the American Society of Mechanical Engineers (ASME), offer activities that can help build skills toward earning the "Building a Better Future" interest patch. Talk with your troop leader to find out more.

## → Websites to Visit

■ Discover Engineering.Org ([www.discoverengineering.org](http://www.discoverengineering.org))

■ Engineer Girl! ([www.engineergirl.org](http://www.engineergirl.org))

■ Junior Engineering Technical Society ([www.jets.org](http://www.jets.org))

■ Lockheed Martin Engineers in the Classroom ([www.engineersintheclassroom.com](http://www.engineersintheclassroom.com))

## → Books to Read

Here are two suggestions to get you started. Ask your librarian to suggest more books about engineering.

■ Opportunities in Engineering Careers, by Nicholas Basta (VGM Career Books, 2002).

■ Cool Careers for Girls in Engineering, by Ceil Pasternak and Linda Thornburg (Impact Publications, 1999).



**"It was really, really tough deciding on a major. I liked so many things, so I decided to focus on subjects that are useful in almost every field—math, computer science and communications (public speaking, writing, technical writing)."**

—Duncan Atchison (shown here testing a special monitor used by astronauts) is a project engineer with Lockheed Martin in Moffett Field, California. He has a bachelor's degree in mathematics from the College of William and Mary and a master's degree in human resource development from Marymount University.

# In Their Own Words....

**Lockheed Martin engineers talk about some cool parts of their jobs:**

**"I've simulated a torpedo hit and seen the first flights of an entirely new aircraft."**

—Jerome Socha, aerospace engineer

**"I was aboard the USS San Juan, a nuclear submarine, on its commissioning voyage to San Juan, Puerto Rico."**

—James Evans, systems engineer

**"I helped figure out how to levitate moon dust."**

—Arwen Davé, mechanical engineer

**"I run programs on two of the world's three fastest computers."**

—Thomas Laub, nuclear engineer

**"I get to work with robots."**

—Shelia Salinas, software engineer

**"I flew with the U.S. Coast Guard on law enforcement missions off the Florida coast."**

—Cheryl Kotan, systems engineer

## it's a fact! \*

**Education pays off.**

**Consider this:**

- The estimated lifetime earnings of someone with a high school diploma—\$1.2 million
- The estimated lifetime earnings of someone with an associate degree—\$1.6 million
- The estimated lifetime earnings of someone with a bachelor's degree—\$2.1 million
- The estimated lifetime earnings of someone with a master's degree—\$2.5 million



\*From [www.learn doe earn.org](http://www.learn doe earn.org)