Start Engineering

ENGINEERING CAREER GUIDE

CONDENSED EDITION

LEARN ABOUT:

- The many fields of engineering
- Where and what to study
- Amazing innovations to save the planet

PLUS:

HOT CAREERS IN AI, BIOTECH, AND CYBER!

what's engineering?

Do you want to be creative, take on real challenges, and make a difference in the world? Want to design fast, quiet, and more efficient cars that help save the environment? Or maybe you want to create fantastic roller coasters and innovative video games! Using science, math, and the latest technologies, engineers solve problems and create inventions. An engineering degree is the basis for an exciting and challenging career. Here's a quick look at some of the things that engineers are up to. Engineering is..

Cool New Gadgets

Behind every cool new gadget, from the Apple Watch to the GoPro, is a team of engineers. Mechanical, electrical, and materials engineers shape the design, and computer engineers develop the software that makes it all work. Now, the latest amazing gadget is the Viture One. It lets you take your gaming and streaming apps anywhere you go. Although pricey ($479, or $588 with neckband), you might not need a new TV or entertainment system at home anymore! These lightweight glasses weigh less than 3 ounces and offer a huge virtual screen, similar to a 120" TV. The sound quality is excellent, and only you can hear it — even if the volume is high. You can watch movies or play loud games, and your friend beside you won't hear a thing. An optional neckband connects to the frames with a magnetic cable and comes with streaming apps for cloud-based play. Plus, these glasses have a sleek and stylish appearance, combining classic style with impressive tech. Cool!

Rocket Ships

NASA has joined forces with SpaceX, a company that builds advanced rockets and spacecraft, to make space travel and exploration more accessible and efficient. SpaceX's groundbreaking achievements have significantly lowered launch costs, making space more accessible. Recognizing the potential of these rockets, NASA decided to use them to transport supplies and astronauts to the International Space Station (ISS).

But SpaceX and NASA have even more ambitious plans. They aim to return to the Moon and eventually explore Mars. To achieve these goals, SpaceX is working on a spacecraft called Starship, which is designed to take humans to various destinations in our solar system. A fully reusable spacecraft, it holds promise for both lunar and interplanetary travel. NASA's expertise and resources, combined with SpaceX's innovation, are paving the way for ambitious missions that were once deemed impossible.

Better Vaccines, Made Faster

COVID-19 has made it clear how crucial vaccines are in keeping us healthy, and biomedical engineers have been champions in creating those vaccines. Companies like Moderna and Pfizer used biotechnology to quickly whip up COVID-19 vaccines that have prevented millions of people from getting really sick or even dying. Traditionally, drug-makers produce vaccines by growing large amounts of the virus or bacteria that the vaccine is meant to protect against, a time-consuming process that poses a risk of contamination. Biotechnology can make vaccine development faster and vaccines themselves more effective. Plus, it's even allowing us to develop vaccines for diseases we couldn't treat before, like cancer! BioNTech has developed a cancer vaccine that helps the immune system attack cancer cells, which is currently being tested in clinical trials for melanoma, prostate cancer, and breast cancer.

Thrill Rides

Mechanical and architectural engineers are on a never-ending quest to make things taller, better, faster, and stronger. Nothing better exemplifies these aspirations than the field of roller coaster design. Now, it's time to add "wetter" to the mix. After pandemic-related delays, Six Flags Over Texas finally unveiled Aquaman Power Wave. This launch-style coaster suspends riders 150 feet high at a 90° angle before hurtling them across the more than 700 feet of track at 63 miles per hour into a massive splashdown. Before the ride begins, the water level drops to let the coaster move over it. As the car reaches the vertical spike, water flows from side reservoirs into the pool, setting up the enormous splash — which also slows the vehicle down to end the ride. It's a feat of engineering as well as a refreshing escape from the Texas summer heat.

PHOTOS COURTESY VITURE ONE, SPACEX, AND SIX FLAGS. VACCINE PHOTO: ISTOCKPHOTO.COM

Clean Skincare

Bioengineering is revolutionizing the skincare industry. Consumers are demanding environmentally-friendly products, and biotech companies like Biossance and Ameva are leading the charge. Their innovative offerings are not only effective, but also better for the planet. For instance, Biossance has successfully replaced a popular skincare ingredient, formerly sourced from sharks, with a new compound made of renewable sugarcane and bioengineered yeast. And Ameva has developed plant-derived enzymes that nourish the skin and establish a protective shield without using planet-hurting chemicals. While the engineering behind skincare products can only be seen under a microscope, its implications are far-reaching. Sustainable ingredients protect endangered species and our planet's precious biodiversity.

Realistic Video Games

Details matter when you're trying to simulate something as fast-paced and exciting as a basketball game. The engineers at Visual Concepts have a clear goal each year: to create a smarter, deeper, and more nuanced gameplay experience for players. This year, their focus is on "authenticity," starting with action at the rim. You can now control when and for how long you hang on the rim after a dunk, a wild new detail. Developing this feature was no simple task; the engineers spent a couple of years working on the complex technology behind it. They also updated the Pro Stick with new gestures, enhancing the overall gameplay. How fun!

Helping Others

Esper Bionics' prosthetic hand is a groundbreaking advancement in bionic technology. Using artificial intelligence and digital signal processing, it is the world's first AI-powered, cloud-based robotic prosthetic that continuously learns and improves over time. The lightweight device incorporates up to 24 wearable sensors, effectively detecting and processing muscle activity and brain impulses. Through machine learning on Esper's platform, the hand becomes more "intuitive" as it adapts to the user's needs and preferences. Dima Gazda, Esper Bionics' CEO and co-founder, is a medical doctor and engineer who believes that electronic advancements hold the potential to revolutionize the prosthetic market.

Trucks That Drive Themselves

The trucking industry is central to the American economy, moving nearly 75% of the nation's freight. But there's a serious shortage of truckers right now, as 300,000 leave the industry every year. Enter TORC Robotics, which hopes to fill that shortage with self-driving trucks. Founded in 2005 by engineers from Virginia Tech, TORC is at the forefront of this technology, having long created autonomous vehicles for the U.S. military. A partnership with Daimler Trucks is taking them to the next level. They are outfitting Daimler trucks with cutting-edge artificial intelligence (AI) and advanced sensing technologies, including LiDAR (Light Detection and Ranging), cameras, and radar. Combined with GPS, such systems enable trucks to navigate and operate without human intervention. AI allows the trucks to process the vast amounts of sensor data in real time, making the trucks able to recognize objects, assess road conditions, and plan their movements accordingly. As the trucks are tested on public roads (with a safety driver), TORC continues to gather data for efforts to improve the vehicles. However, more testing, AI and machine learning will be required before they will be ready for commercial use. Trucking may never be the same.

Self-Healing Materials

Cement is a key ingredient in concrete, which is the second most consumed material in the world, behind only water. Concrete has long been a reliable choice for engineering structures like buildings, roads, and bridges. However, concrete can eventually develop cracks despite its strength and durability, leading to annual repair costs of $12 billion. Plus, it is responsible for a staggering 8% of global carbon emissions. Engineers are seeking solutions.

Pacific Northwest National Laboratory, a Department of Energy lab renowned for technological innovation, discovered that if they blend cement with certain polymers, the composite material can repair its cracks within 24 hours, making structures more durable and longer-lasting.

Meanwhile, the company Biomason is experimenting with adding dormant bacteria to concrete. If a crack forms, the bacteria spring into action, producing calcite, a cement component, to seal up the crack.

Finally, Prometheus Materials uses blue-green algae to produce calcite through photosynthesis. This process, which essentially involves creating solid rock from light, is the ultimate sustainable solution. Not only does it generate less CO_2, it extracts CO_2 from the environment.

PHOTOS COURTESY THE COMPANIES

3D-Printed Homes

The world needs more homes, fast: America alone is facing a deficit of about 5 million housing units. Engineers are rising to the challenge. One cool solution is House Zero, a 2,400-square-foot, 3-bedroom home created with cutting-edge 3D-printing technology. Designed by architecture firm LakeIFlato and construction tech startup ICON, it features an airtight wall system made of their high-strength concrete called Lavacrete. A 9,500-pound robot can 3D-print the house in just ten days, reducing build time, costs, and waste. Inspired by House Zero's success, ICON has partnered with homebuilding giant Lennar to establish a 100-home community in Austin, all 3D-printed. Instead of using manual labor and traditional materials, large 3D printers with robotic arms deposit layers of specialized material, like concrete, based on digital designs. This faster process requires fewer human workers, saving time and costs. Plus, it allows for more customization, giving houses unique features. 3D printing also reduces construction waste and offers eco-friendly options. Though still new, this technology is evolving and has the potential to revolutionize the construction industry, providing faster, cost-effective, and sustainable solutions to meet the growing demand for housing.

Green Fuels

Engineers are using an amazing variety of materials and methods to create more sustainable fuels:

- **ALGAE** Synthetic Genomics is growing algae in ponds or bioreactors and converting it into biofuels such as biodiesel and jet fuel.
- **CARBON EMISSIONS** A partnership between Honeywell and HIF Global is launching operations to convert industrial waste gases, such as carbon monoxide and carbon dioxide, into biofuels. C3Biotech, meanwhile, feeds carbon emissions to trillions of carbon-hungry microbes that turn pollution into fuels.
- **PLANTS** Biotech companies such as LanzaTech use special enzymes to break down plant materials such as corn, sugarcane, and switchgrass to produce liquid fuel.
- **MICROBES AND SUNLIGHT** Certain strains of bacteria and yeast can be engineered to produce ethanol and other fuels directly from sunlight without the need for plants or algae. LanzaTech is also developing this technology.
- **WASTE** Companies like Enerkem specialize in converting non-recyclable and non-compostable waste materials, such as wood chips and municipal solid waste, into biofuels. Other companies like Renewable Energy Group are converting used cooking oil, food scraps, animal fats, and plant oils into biofuels.

Special Deliveries

Since their inception in 2016, Zipline's electric drones have made a significant positive impact, efficiently delivering vital supplies like blood in Rwanda and COVID-19 vaccines in Ghana. By using electric drones, Zipline enhances delivery speed while making the environment cleaner and greener by reducing traffic congestion and pollution. Over time, the company has extended its services to encompass diverse sectors, including food, retail, and agriculture.

Operating in seven countries across North America, Africa, and Asia, Zipline has completed over 700,000 deliveries, covering an incredible 50 million miles. Their vision is to create a teleportation-like service, ensuring everyone can access the goods they need exactly when needed. Companies like Walmart, GNC, and Pagliacci Pizza have partnered with Zipline to get fast and reliable deliveries, from prescriptions to pizzas, right to homes as requested.

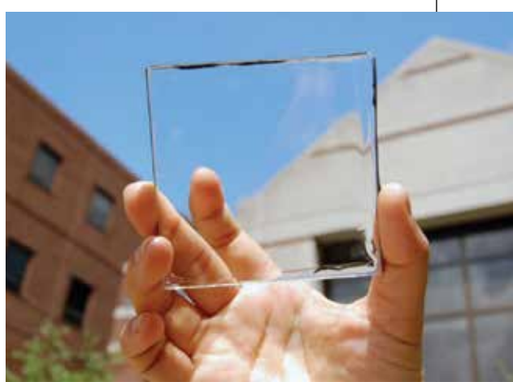
Fabrics From Plants

Synthetic fabrics that stretch as we move — called lycra or spandex — are perfect for workouts or lounging around. Traditionally, these fabrics are made from fossil resources which are not eco-friendly. Biotech firms like Natural Fiber Welding are responding by creating plant-based materials as sustainable alternatives — and consumer companies like H&M, Patagonia, and New Balance are buying, bringing these new fabrics and materials to the marketplace.

Meanwhile, a biotech company called Spiber uses a *fermentation process* to make its stretchy fabrics. You can check them out at Pangaia and The North Face. And Bolt Threads has developed a way to create silk from fermented yeast, and leather from mushrooms, yielding cruelty-free and eco-friendly alternatives to conventional materials. Sustainability-focused designers like Stella McCartny are into it — take a look at her mushroom-leather bag, above.

New Ways to Harness Energy

You might have noticed thick solar panels on rooftops, but there's a new solar technology that looks just like glass and can replace windows to generate energy. Developed by engineers at Michigan State University in 2011, these transparent solar cells capture invisible sunlight wavelengths and convert them into electricity. After a decade of testing and improvements, the MSU Biomedical and Physical Sciences Building became the first site to install this revolutionary energy technology. The building's windows were replaced with 100 square feet of transparent solar glass panels, generating enough electricity to light up the atrium. The inventors believe this technology could turn any surface of a building or landscape into a solar array, generating power right where it's needed — without anyone even realizing it's there.



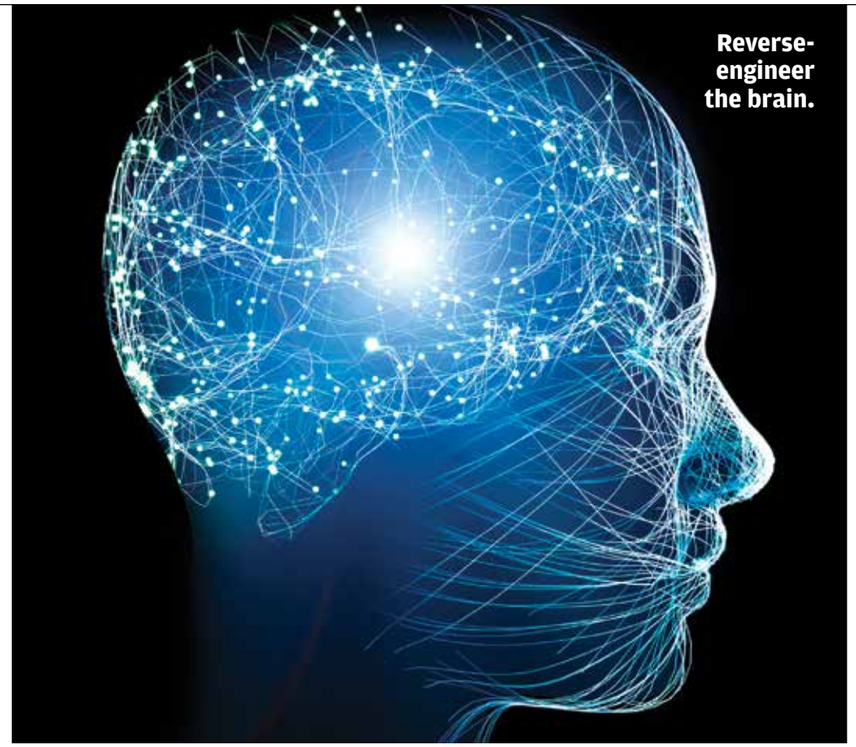
PHOTOS COURTESY THE COMPANIES

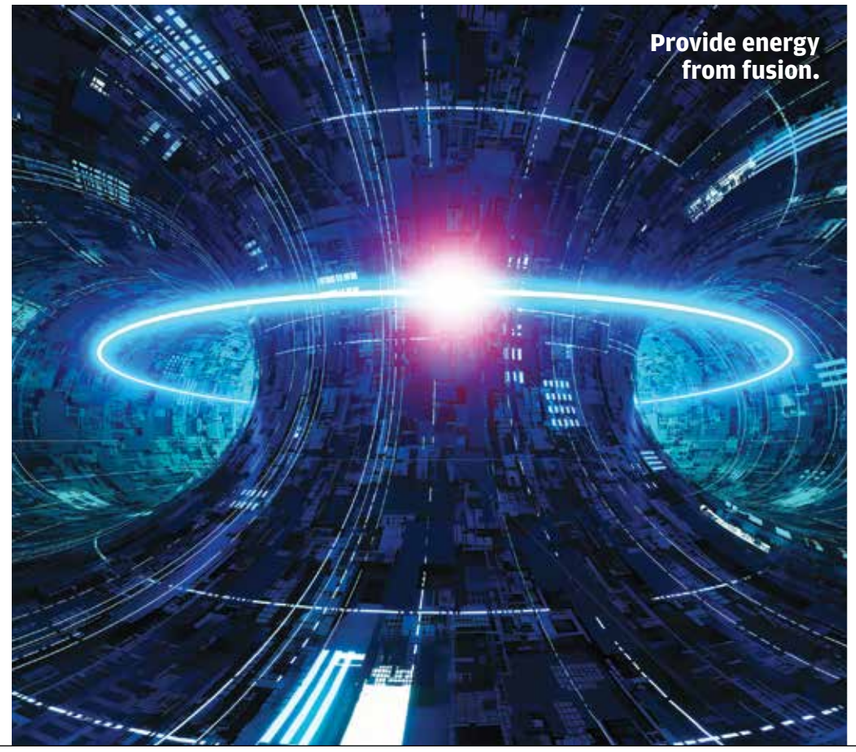
SAVING THE WORLD

One Challenge at a Time

About fifteen years ago, the National Academy of Engineering surveyed the world to identify 14 Grand Challenges engineers could tackle to enhance ongoing human existence. These challenges, set as a roadmap for the next century, aim for engineering accomplishments that would create a more sustainable, healthy, secure, and joyful world to call our own. “We wanted to show how engineering can help guide us into the future,” explains Randy Atkins, director of the Grand Challenges project. Engineering schools nationwide have incorporated the Grand Challenges into their students’ learning through the Grand Challenges Scholars Program. Students build competencies in five areas vital to addressing projects with global scope: technical content, multidisciplinary and multicultural perspectives, business savvy, and social consciousness. For students with a yen to change the world, a school with a Grand Challenges Scholars Program could be the first step. Read on to learn about just some of the Grand Challenges.

► **Reverse-engineer the brain.** Figuring out how the brain works and learns could lead to engineered solutions for human neurological problems. Called neuroprosthetics, engineers and scientists in this field have





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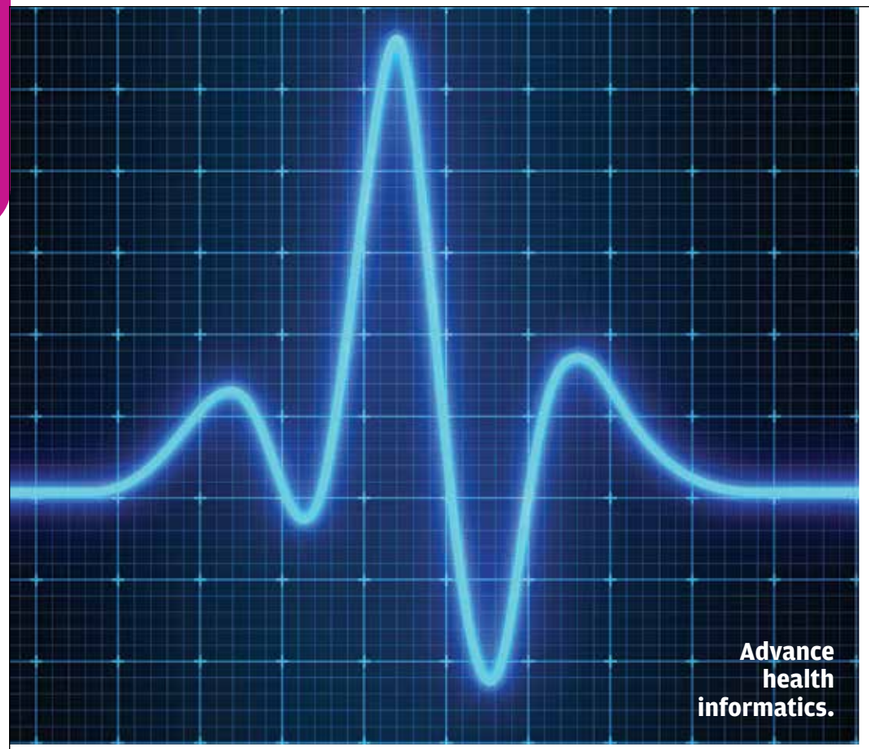

already made progress: paralyzed monkeys given a brain implant could walk again. Understanding how the brain works also drives progress in artificial intelligence, another frontier on which engineers work.

► **Provide energy from fusion.** Human-engineered fusion has been demonstrated on a small scale. The challenge now lies in scaling up the process to commercial levels, efficiently, cost-effectively, and with minimal environmental impact.

► **Enhance virtual reality.** Across various specialized fields, from psychiatry to education, virtual reality is emerging as a powerful training tool for practitioners and even a means for doctors to treat patients, in addition to the entertainment applications that have become increasingly common.

► **Engineer better medicines.** Engineering can enable the development of new medical systems to use genetic information, sense small changes in the body, assess new drugs, and deliver personalized healthcare through vaccines tailored to each individual.

► **Advance health informatics.** Given that computers are integral to nearly every aspect of our lives, adopting a structured approach to collecting, managing, and utilizing health-related information — referred to as health informatics — can enhance the quality of medical care. It can help doctors take better care of patients, make things work more smoothly, and respond faster to big health problems that affect many people.

► **Engineer the tools of scientific discovery.** Scientists always seek better tools for imaging the body and brain and rely on engineers for this. Space exploration is another area where engineering expertise is needed. Long-distance human flight faces numerous challenges, from the danger of radiation to the need to supply sustainable sources of food, water, and oxygen.

► **Secure cyberspace.** It's more than preventing identity theft. Almost every day, we hear about hackers getting into computer systems thought to be protected. Critical systems in banking, national security, and physical infrastructure are at risk. In fact, serious cybersecurity breaches in financial and military computer systems have already occurred.

► **Restore and improve urban infrastructure.** Old, overused, and undersized infrastructure systems are in dire need of revival. As more people congregate in urban areas, the challenge only grows to refurbish and build systems that allow lives, business, and society to function. Engineers are working on new construction methods and materials as well as making better use of current resources.

What catches your interest? To read more about these and other Grand Challenges, go to https://www.grandchallenges.org/.

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options, options, options

Here are some of the most popular disciplines in engineering. This is not a complete list but a look at the major fields. Multidisciplinary engineering is growing and it's likely that you will be engaged in coursework that includes several disciplines. Just because you choose a primary field of engineering does not mean you are "locked into" that one field forever!

Aerospace Engineers

They design and build airplanes, jet fighters, rockets, space ships, and satellites. Aerospace engineers work at places like NASA, where they may design rovers to explore distant planets or plan a human colony on the moon. They are also making light-weight airplanes that burn less fuel, keeping the air we breathe cleaner.

Agricultural Engineers

They develop new ways to grow, harvest, and distribute high-quality, nutritious food. Agricultural engineers design vertical farms to be built in cities so crops and livestock can be raised where people live, reducing transport costs. They also are figuring out how to grow food using less water and fertilizer, saving resources and keeping the earth healthy.

Wow! Average starting salary for engineers:

$74,405

Average starting salary for computer engineers:

$81,000

Biomedical Engineers

They design, build, and test technologies that doctors can use to diagnose and treat patients. They design prosthetics (artificial arms and legs) so athletes who have lost a limb can still run, jump, and swim. They're creating artificial organs like hearts, kidneys, and livers, and growing tissues like skin and bone.

Chemical Engineers

They take raw materials and transform them into the things we use every day. Chemical engineers help develop new formulas for life-saving drugs, strong plastics for our phones, long-lasting paint for buildings, and so much more. They also work to make chemical processes use less energy and generate less waste.

QUICK TIP >
Join your school's robotics team to learn how to program and to practice working in teams. But don't worry if you don't like robotics — there are plenty of other aspects of engineering!

Engineering majors have the highest starting salaries of all college majors — 20% higher than even business majors.

Civil Engineers

They design and build the structures that we live in and travel on — buildings, roads, canals, and bridges. Civil engineers work on big projects, like hydroelectric dams that produce electricity for an entire region and city subway systems that get large populations from here to there. They also figure out how to use less energy to heat and cool a single structure.

Computer Engineers

They design the software and hardware for computers, smartphones, and all the other electronic gadgets we rely on. They help to design video game systems or social media websites, and work on cyber security to protect information. Computer engineers often need to combine electrical engineering and computer science.

Electrical Engineers

They build machines and systems that transmit electricity from where it's produced to where it's used. Electrical engineers also apply their know-how to computer systems and electronics, designing microchips to control robots, game consoles, or tablets. They also help develop wind turbines, solar cells, and other renewable energy technologies.

QUICK TIP >
Be sure to take four years of math and science in high school, but don't sideline your English classes! You need to be able to communicate effectively in college and in the workplace.

SOURCES: AMERICAN SOCIETY FOR ENGINEERING EDUCATION, NATIONAL ASSOCIATION OF COLLEGES AND EMPLOYERS, THE DEPARTMENT OF LABOR AND THE U.S. BUREAU OF LABOR AND STATISTICS

ILLUSTRATIONS BY HUAN TRAN

QUICK TIP >
Get in touch with a local branch of an engineering society to meet with real engineers. Ask questions to get a feel for what they do.

Environmental Engineers

They devise solutions to the problems facing us with our air, plants, soil, and water. Environmental engineers design systems to prevent and control pollution and conserve the earth's resources. They work on new ways to collect and sort waste so that more of it can be recycled. They are also trying to slow down and cope with the effects of climate change.

Manufacturing Engineers

They design factories and systems to make all the stuff that people use today — cars, toys, airplanes, and more. Manufacturing engineers help figure out efficiencies, how to get lots of product quickly without sacrificing quality. They also find ways for factories to use less energy and fewer materials, making production processes cheaper and cleaner.

Mining Engineers

They develop techniques for getting minerals out of the ground so we have the needed raw materials to make things. Mining engineers may design mines to dig out precious metals like gold or to extract resources like coal and uranium. They also develop ways to dig underground safely without destroying the land above or polluting the water below.

The average annual salary of a nuclear engineer is over **$83,000**

Over 146,000 engineering bachelor's degrees were awarded in 2022, 20% higher than 5 years ago.

Nuclear Engineers

They design, develop, monitor, and operate nuclear plants used to generate energy. Nuclear engineers may work on the fuel cycle, the production, handling, and use of nuclear fuel, as well as its safe disposition. They may also develop the nuclear imaging technology used to diagnose and treat medical problems.

Materials Engineers

They create new substances out of the basic building blocks of matter, sometimes imitating those found in nature. Materials engineers use chemistry and physics to design materials with just the right properties for whatever engineers want to make. Some work with nanotechnology, like carbon nanotubes, to make new types of electronics and medicines.

The school that issued the most engineering degrees in 2022 was Georgia Tech with: **3,765.**

24%

of all engineering degrees awarded in 2022 were in mechanical engineering.

Mechanical Engineers

They design and build all types of machines and products, often using computers to work out their great ideas in 3-D. Mechanical engineers are found in many fields, designing what's useful — appliances, medical equipment, and cars — and also what's fun — rollercoasters, cool new gadgets, and more.

Ocean Engineers

They design and build marine vessels, whether ships that sail on the water's surface or submarines that navigate the depths. Ocean engineers also design marine structures, like floating oil rigs and offshore wind farms. They work on solving problems of beach erosion and water pollution, such as the trash from our throw-aways.

Systems Engineers

They think about the big picture, figuring out how to manage complex projects involving people, processes, goods, and information. Systems engineers often need deep knowledge about many different areas, as well as analytical and organizational skills. They work in a wide variety of fields, such as transportation, the military, manufacturing, and software.

QUICK TIP >
Apply for summer internships or apprenticeships with firms in your field of interest. A little experience early on can really influence your ultimate career choice.

SCHOOLS THAT AWARD THE MOST ENGINEERING DEGREES, BY DISCIPLINE

AEROSPACE

1. Purdue University
2. University of Central Florida
3. Georgia Institute of Technology
4. Embry Riddle, Daytona Beach
5. University of Colorado Boulder
6. Virginia Polytechnic Institute
7. Texas A&M University
8. Iowa State University
9. University of Maryland, College Park
10. The University of Texas at Austin

BIOMEDICAL

1. Georgia Institute of Technology
2. University of California, San Diego
3. Texas A&M University
4. North Carolina State University
5. Boston University
6. University of California, Irvine
7. University of Wisconsin, Madison
8. University of Maryland, College Park
9. University of Michigan
10. University of Virginia

CHEMICAL

1. Texas A&M University
2. Georgia Institute of Technology
3. Purdue University
4. University of Texas at Austin
5. Ohio State University
6. University of Alabama
7. University of Illinois, Urbana – Champaign
8. Colorado School of Mines
9. Arizona State University
10. Pennsylvania State University

CIVIL

1. California State Polytechnic, Pomona
2. Virginia Polytechnic Institute
3. Texas A&M University
4. Pennsylvania State University
5. University of Illinois, Urbana – Champaign
6. New Jersey Institute of Technology
7. Purdue University
8. California State University, Long Beach
9. California State University, Sacramento
10. Iowa State University

INDUSTRIAL / MANUFACTURING

1. University of California, Berkeley
2. Georgia Institute of Technology
3. Purdue University
4. Texas A&M University
5. Virginia Polytechnic Institute
6. University of Michigan
7. Pennsylvania State University
8. Arizona State University
9. Clemson University
10. University of Illinois, Urbana – Champaign

MECHANICAL

1. Georgia Institute of Technology
2. Iowa State University
3. University of Central Florida
4. Purdue University
5. Texas A&M University
6. University at Buffalo, SUNY
7. Virginia Polytechnic Institute
8. University of Florida
9. University of Alabama
10. University of Maryland, College Park

ELECTRICAL

1. Arizona State University
2. Texas A&M University
3. University of Illinois, Urbana – Champaign
4. Pennsylvania State University
5. Purdue University
6. University of California, San Diego
7. North Carolina State University
8. Georgia Institute of Technology
9. California State Polytechnic, Pomona
10. California Polytechnic, San Luis Obispo

COMPUTER

1. University of Illinois, Urbana – Champaign
2. Iowa State University
3. Purdue University
4. Virginia Polytechnic Institute
5. Texas A&M University
6. Georgia Institute of Technology
7. North Carolina State University
8. Northeastern University
9. San Jose State University
10. University of Central Florida

ALL PHOTOS COURTESY THE SCHOOLS

NOTE: ALL DATA IS FROM THE 2022 SCHOOL YEAR, LATEST AVAILABLE. SOURCE: AMERICAN SOCIETY FOR ENGINEERING EDUCATION.

IN DEMAND ... AND WELL PAID

Engineers work at large corporations and established small businesses. They start high-tech companies that power the nation's economy and can also be found in government agencies. Here are examples of where engineers from different disciplines work.

AEROSPACE
BAE Systems, Boeing, Department of Defense and Energy, Lockheed Martin, NASA, Northrop Grumman

AGRICULTURAL
John Deere, Cargill, Kellogg's, Weyerhaeuser

BIOMEDICAL
Boston Scientific, Eli Lilly, Genentech, Johnson & Johnson, Medtronic, Merck, Pfizer

CHEMICAL
Air Products, Bayer, Chevron, Dow, Dupont, Procter & Gamble

CIVIL
Bechtel, CH2M Hill, CSX, Department of Transportation, Fluor, U.S. Army Corps of Engineering

COMPUTER
Apple, Cisco, Department of Defense, Electronic Arts, IBM, JPMorgan Chase, Sophos, Symantec

ELECTRICAL
Dassault Systèmes, General Electric, Google, Intel, Micron, Raytheon,

ENVIRONMENTAL
Environmental Protection Agency and Department of Interior, Roux Associates, Sierra Club, Veolia

MANUFACTURING
General Dynamics, Illinois Tool Works, Raytheon, Toyota

MATERIALS
Alcoa, General Motors, Kimberly Clark, Nike, 3M, Under Armour, Unilever

MECHANICAL
BMW, Caterpillar, Ford Motor Co., General Motors, Walt Disney World

MINING & PETROLEUM
APA Corp., BP, Chevron, Exxon Mobil, Ingersoll-Rand, Schlumberger, Shell Oil

NUCLEAR
Babcock & Wilcox, Constellation Energy, Los Alamos National Lab, Westinghouse Electric

OCEAN
Deep Ocean Engineering, GEC, Department of Defense

SYSTEMS
FedEx, Rockwell Automation, Royal Caribbean, United Airlines, UPS

Engineering graduates across disciplines are among the highest-paid students coming out of college — 20% higher than even business majors. Petroleum engineers earn the most due to the global demand for oil and gas, but market conditions could always change.

AVERAGE SALARIES

DISCIPLINE	STARTING SALARY
Engineering	$74,405
Computer Science	$72,843
Math & Science	$67,199
Business	$62,069
Social Sciences	$60,107
Agriculture	$59,282
Communications	$58,097
Humanities	$52,938

TOP-PAID MAJORS

MAJOR	STARTING SALARY
Petroleum Engineering	$117,000
Marine Engineering	$90,000
Nuclear Engineering	$83,000
Computer Engineering	$81,000
Chemical Engineering	$79,000
Electrical Engineering	$77,000
Mining Engineering	$75,000
Mechanical Engineering	$75,000
Aerospace Engineering	$73,000

SOURCES: US CENSUS BUREAU, BIG ECONOMICS, 2022 DATA


Pfizer


Google


Dassault


Boeing


Lockheed Martin


Nike


Ford

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SOURCE: AMERICAN SOCIETY FOR ENGINEERING EDUCATION AND THE NATIONAL ASSOCIATION OF COLLEGES AND EMPLOYERS

Find out today where a degree in engineering could take you tomorrow.

Engineering is smart, diverse people making our lives easier, better, safer – and more fun! Look inside to discover the cool things engineers do, find the school that's right for you, and determine the pathway to the engineering career you want.

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