

TOP
10

STEM



CAREERS



Here's a look at the fastest growing opportunities in science, technology, engineering, and math

BY S. C. BIEMESDERFER

There's been more and more buzz lately about the demand for STEM professionals. Employers and recruiters all over the country are looking for people with the skills to fill the more than 7 million STEM (science, technology, engineering, and mathematics) jobs. While the current national unemployment rate is in the neighborhood of 7 percent to 8 percent, the unemployment rate for U.S. citizens with STEM PhDs is just 3.15 percent, and 3.4 percent for those with STEM graduate degrees.

According to the Department of Labor, only 5 percent of U.S. workers are employed in fields related to science and engineering, yet they will ultimately be responsible for more than 50 percent of the country's economic expansion. "The need for STEM talent is very real," says HR and recruiting expert Maren Hogan, adding that "80 percent of jobs in the next decade will require significant technical skills, which translates to tremendous potential for students qualified to fill those jobs."

TOP 10

“STEM spells opportunity in many ways, including financially, with employees in STEM occupations typically earning average salaries that are higher than those of employees in other fields.”

Hogan and STEM advocates such as Edie Fraser, CEO of STEMconnector, strongly encourage students with STEM aptitude to seize the opportunity at hand. “There has never been a more important time to focus on our students, and there has never been a more important time to be sure that all students are prepared for the workforce, especially STEM jobs, and especially our minority and female students,” says Fraser. Science and engineering job opportunities are expected to increase by more than 20 percent over the next five years — more than double the rate of the overall workforce, with projections of as many as 8.65 million STEM jobs in the U.S. labor market by 2018.

STEM spells opportunity in many ways, including financially, with employees in STEM occupations typically earning average salaries that are higher than those of employees in other fields. In PayScale’s list of 130 top-tier salaries for entry-level through mid-career jobs, the top 13 rankings were STEM positions, and they accounted for 40 of the top 50 careers on the list. Starting annual salaries are reported to range from \$50,000 to \$100,000, with midcareer STEM profession-

als earning salaries in the range of \$100,000 to more than \$160,000 a year.

So what could this mean for you? If you’re interested in being one of the sought-after 8.65 million, we’ve done some homework for you. Here’s what you need to know about the top 10 careers for aspiring STEM professionals. And those fields are (in no particular order):

- Nuclear Engineer
- Database Administrator
- Aerospace Engineer
- Computer Network Architect
- Geoscientist and Environmental Scientist
- Petroleum Engineer
- Engineering Manager
- Statistician
- Biomedical Engineer
- Actuary



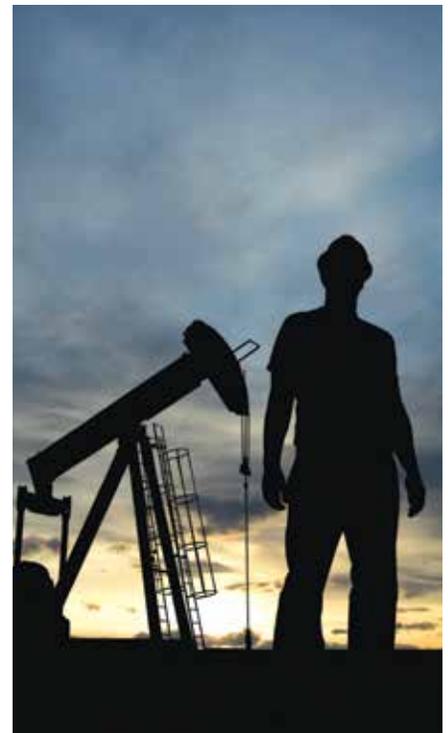
Nuclear Engineer

How about working with atomic particles? Being a nuclear engineer generally involves complex projects with a very specific focus. Some nuclear engineers specialize in nuclear fission that powers reactors, some help develop radiological tools for medical treatments and disease diagnosis, some focus on the safe handling of nuclear waste or disposal of nuclear fuel, while others work in the defense industry and weapons development. There are also nuclear physicists who work in laboratory settings doing more theoretical and experimental work for educational or research organizations. Many nuclear engineering jobs are government positions, but there are also opportunities in private sector companies. The starting point for nuclear engineers is what you might think: an undergraduate degree in nuclear engineering. Median annual pay: **\$107,000.**

Database Administrator

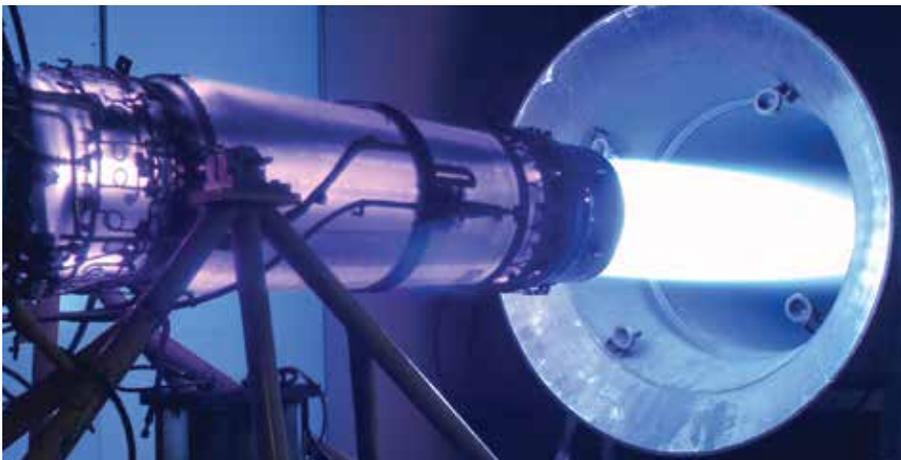


A database administrator (DBA) is responsible for the design, construction, and maintenance of database management systems — a role that could be filled in any number of settings. A DBA identifies user needs, sets up computer databases, tests systems, and is responsible for system security. Virtually every business and organization in America has an in-house DBA or outsources this job to an IT firm, so you would have many options in this role, ranging from being part of a larger, consumer-facing business to working in a government agency, an IT firm, or even running your own business as a sole proprietor. Most DBAs have an undergraduate degree in computer science or management information systems, and specific software program certifications can be required (for example, Microsoft Certified Database Administrator). Median annual pay: **\$80,000.**



Petroleum Engineer

Petroleum engineers are frequently hired by oil and gas companies to develop approaches for locating and safely extracting and refining oil and gas. The job can be multifaceted and involve a spectrum of activity, including locating dig sites, developing equipment and tools, and overseeing extraction and refinement processes. This position can also include developing cost-efficient and environmentally sound methods for drilling and extraction. Petroleum engineering often involves fieldwork, as well as travel to drilling sites operated by multinational oil and gas companies around the world. With sometimes long hours and typically a lot of time on the road, salaries in this field are higher than in most STEM professions. You'll need at least an undergraduate degree to start on this career path, and you should be able to demonstrate strength in math, computer programming, science, and physics. Median annual pay: **\$147,000.**



Aerospace Engineer

If you really are a rocket scientist, this role may be for you. Aerospace engineers play a lead role in the design, construction, and the testing of everything from aircraft to spacecraft, satellites, and missiles. As an aerospace engineer, you could be employed in the private or public sector, with the top-hiring employers falling into the categories of scientific research and development, government agencies, aerospace product and parts manufacturing, and the design of navigational, measuring, propulsion, and control devices. Good problem-solving skills can be a real plus in this job, as there are rigorous testing phases for building things that end up flying high in the air. Job candidates in this field should have an undergraduate degree in aerospace engineering or another field of science or engineering related to aerospace systems. Aerospace engineering positions related to national defense also require security clearances. Median annual pay: **\$105,000.**

TOP 10

“In addition to greater awareness of the economic opportunity, stereotypes have changed — and both male and female students know it’s cool now to be a geek.”

Computer Network Architect

A computer network architect designs computer and telecommunications networks, often as a specialist within a larger company, or as part of an IT firm. This job requires expertise in hardware and software, and the ability to grasp an organization’s needs across the entire range of users. Depending on the size of an organization, a network architect may also help coordinate network construction as well as maintenance, repairs, or upgrades. Rather than being an entry-level position, this is typically a supervisory role for someone who’s been working with networks for several years. Success as a computer network architect calls for a great deal of analysis and precision, strong listening skills, the ability to innovate, and the capacity to work with deadline-driven stress. An undergraduate degree in computer science will help you get started on this career path, and specific certifications may be required (e.g., Cisco, Nortel, Novell). Median annual pay: **\$94,000.**



Women in STEM

According to the Institute for Women’s Policy Research and the National Coalition for Women and Girls in Education, female students represent fewer than one in four students in STEM education programs. And according to a study by researchers at the University of Pittsburgh and the University of Michigan, women may be less likely to work in STEM professions out of choice, not because of lack of ability. In fact, researchers found that female students with high scores for both verbal and math skills were less likely to pursue STEM careers because they had more career options to consider.

But in an economy in such need of STEM professionals, STEM advocates are urging women to recognize the great opportunity at hand. “This has never been more important, and I think we will see interest continue to grow,” says HR consultant Maren Hogan. “In addition to greater awareness of the economic opportunity, stereotypes have changed — and both male and female students know it’s cool now to be a geek.”

Cheryl Birdsong-Dyer, a network access planning analyst for Sprint and a spokeswoman for the American Society for Quality (ASQ), points out that risk taking is required to solve problems in STEM settings, and that in a recent ASQ survey that characteristic was flagged as an issue for girls. The study found that 58 percent of teenage girls said they felt uncomfortable or afraid when facing a difficult problem in school, compared with

34 percent of boys. “We encourage kids with STEM skills and interests, particularly girls, to understand that risk taking is a part of life,” says Birdsong-Dyer, “and that every failure, whether failure to solve a problem or failure to land a particular job, is an opportunity to learn and grow.”

A number of organizations are now working to help close the STEM gender gap. Girls Who Code (girlswhocode.com), for example, was established in 2012 to help equip young women across the country with skills and resources to pursue academic opportunities in computing fields. STEMconnector has released “100 Women Leaders in STEM” (stemconnector.org/100women), a publication in which successful STEM women talk about their commitment to be mentors and sponsors to those who aspire to follow in their footsteps. In addition, the Committee on Women in Science, Engineering, and Medicine (CWSEM), a standing committee of the National Research Council (NRC), continues to step up its efforts to encourage women to pursue STEM professions (sites.nationalacademies.org/PGA/cwsem).

The bottom line: If you are a female student with an interest in STEM, it definitely goes both ways — STEM is interested in you. Identify the job that speaks to you, read about role models, consider finding a mentor, and step up and get the skills you’ll need to compete for those jobs!

— S.B.

TOP 10

“The good news is that with the growing demand for workers, there is also lots of continued growth in the STEM jobs sector.”



Geoscientist and Environmental Scientist

Geoscientists study all aspects of the earth, conducting laboratory research and often spending time in the field collecting data. They examine the earth's internal composition and its various aspects, including fossils, rocks, minerals, and sediments, as well as groundwater, rivers and oceans, the atmosphere, and volcanoes. There are numerous specialties within this career category, including jobs for environmental scientists, geologists, geophysicists, and hydrogeologists. A great deal of math, chemistry, and physics goes into this work, and many professionals in this field tend to work in teams. Communications and writing skills can also be important in geoscientist roles, as report writing and presentations are often part of the job. You should have an undergraduate degree in geology or a related earth science field before applying for an entry-level geoscientist position, and more advanced positions can require an advanced degree. Median annual pay: **\$107,000**.

Where the Jobs Are

California tops the list of states with the most projected STEM jobs by 2018, according to a recent My College Options report funded by technology giant Cisco (available at stemconnector.org). The California STEM Learning Network (CSLNet) is working to help address the STEM worker shortage. “The good news is that with the growing demand for workers, there is also lots of continued growth in the

STEM jobs sector,” says Suzanne Goldstein, CSLNet's chief of policy and development. The organization's mission is to ensure that students have access to high-quality STEM teaching and learning statewide. Similar efforts are underway in a number of states. Other top states for projected growth in STEM jobs are Texas, New York, Florida, Virginia, Illinois, and Pennsylvania. — S.B.



Engineering Manager

An engineering manager supervises other engineers and professionals and manages engineering projects. They are accountable for a range of critical activities, including project planning, budgeting, staffing, training, and quality control. Engineering managers can end up working in a variety of specialty areas, most often in larger companies. Both sides of the brain are required for this work, which calls for experience in business and engineering as well as leadership, communications, and people skills. Successful job candidates in this arena have an engineering management degree — which in most cases is a graduate degree, although some colleges now offer undergraduate Engineering Management programs. These programs usually include a combination of classes in systems engineering, project management, accounting, finance, quality control, mathematical modeling, health and safety, and human resources management. The more experienced an engineering manager is, the higher the salary. Annual median pay: **\$119,000**.



Biomedical Engineer

Biomedical engineering is all about applying engineering principles to the world of medical science, with an aim of improving patient care and quality of life. For example, significant medical advances such as the development of replacement joints, the artificial heart, and the artificial hand have involved critical efforts by biomedical engineers. These professionals also collaborate on and problem-solve challenges such as creating communications and mobility tools for people with physical limitations or injuries. Biomedical engineer jobs tend to be in research and manufacturing companies, hospitals, health care facilities, and rehabilitation units. For this career path, you would want to start with an undergraduate mechanical, electrical, or chemical engineering degree, along with some biology background. If a school offers a biomedical engineering degree, that could be the ticket. Median annual pay: **\$91,000**.

Statistician

If you really like numbers and lots of them, this career could be in your wheelhouse. Statisticians can land jobs in both businesses and the government, working wherever data is needed to report results, inform decisions, test theories, or draw conclusions about the effectiveness of a practice or message. Fields where statisticians work include medicine, the environment, politics, government agencies, and a range of consumer-facing industries. The work includes not only collecting and analyzing data, but also drawing conclusions and reporting on them. Strong verbal skills are a real asset in this position, as you can end up explaining complex statistical data to people with not-so-statistical backgrounds. Many statisticians work in office settings during regular business hours, although some do field research. For an entry-level statistician, you would want an undergraduate degree in statistics and a background working with various types of computer software. Median annual pay: **\$80,000**.



MEET 5 NATIVE STEM STARS

They did it, and so can you! Find out how these Native professionals launched their careers in these top STEM fields, in our Summer Digital Guide.

TOP 10

“Seek out smarts: The work world is continually evolving, but there’s still nothing like a mentor — a role model who understands what it takes to achieve success in your field.”



Actuary

What exactly does an actuary do? It depends on what kind of actuary you’re talking about. These professionals are aces in math and statistics and are hired to work in some of the most complex specialty areas in the financial sector. Many have jobs that focus on pensions or life insurance, but also in the general insurance, investment, education, and health care arenas. Actuaries can be hired to do a range of things, from assessing risk to researching investments, advising on business deals such as mergers and acquisitions, and offering advice on companies’ pension plans. To become an actuary, you must pass a tough series of certification exams. Successfully completing all the exams can take between five and 10 years, but generally speaking, you can get a job in the field after passing the first two tests, one on financial mathematics and one on probability. Doing what it takes to be an actuary eventually pays off. Salaries for experienced actuary professionals are reported to be well into six figures. Median annual pay: **\$107,000.** ■

Words for the STEM-Wise

You’re not alone: STEMconnector reports that “since 2002, American Indian students have had a higher level of interest in STEM than any other ethnicity,” excluding Asian students. “It’s encouraging to see this interest, and we encourage students to pursue the educational paths and STEM jobs out there,” says American Society for Quality spokeswoman Cheryl Birdsong-Dyer.

Near can take you far: Pursuing a STEM-related degree doesn’t have to take you far from home. In fact, STEM students are more likely than non-STEM students to prefer attending a small- or medium-sized college. “There’s no one established way to pursue a STEM career, just do it your own way, and earn and learn where you can,” says STEMconnector’s Edie Fraser.

Seek out smarts: The work world is continually evolving, but there’s still nothing like a mentor — a role model who understands what it takes to achieve success in your field. “We have to be sure that students nurture their love of math and science,” says HR consultant Maren Hogan, who is also

a strong advocate for students seeking out internships and apprenticeships in STEM fields.

Keep your dream close: Nearly 28 percent of high school freshmen declare interest in a STEM-related career, but 57 percent of them lose interest in STEM before graduating. Focus on whatever part of STEM appeals to you, and keep it alive through group projects, hobbies, and jobs. “The most important thing is to simply go for it!” says Suzanne Goldstein of the California STEM Learning Network. “The sky’s the limit when it comes to crafting the perfect STEM career fit for you.”

Learn online: In addition to colleges that offer STEM degrees online, there are schools with courses, lectures, and more to supplement your STEM learning. Go at your own pace and see what’s out there for free. One great place to start is “50 Best Sources of Free STEM Education Online”: onlineuniversities.com/blog/2012/04/50-best-sources-of-free-stem-education-online. — S.B.