

Answering Your Common Questions About Engineering and Engineers



What exactly is “engineering”?

Engineering is defined in the dictionary as “the practical application of science and math” – and that definition really does capture what engineering is all about: Bringing science (with the help of math) to life by creating practical, real-world things. So in a very real sense, engineering is “applied science.”

So an “engineer” would be an “applied scientist”?

Yes! - Someone who takes scientific discoveries and theory out of the laboratory and puts them to work in the real world. In short, engineers “turn science into reality.” So while traditional scientists produce knowledge, as applied scientists, engineers use that knowledge to produce things – products, structures/buildings, machines, technology, complex systems, etc. – just about anything you can think of that is man-made!

That’s not what I thought an “engineer” was!

Unfortunately, engineers haven’t done a good job in getting the word out about what they really do (perhaps because they’re too busy doing it!). As a result, a lot of misconceptions exist about what engineering is and what engineers do, with people believing engineers to be anything from locomotive train operators to mechanics/technicians, to construction supervisors, to NASA personnel, to generic “computer people”. But now you know the truth – as “applied scientists,” engineers “turn science into reality.”

How exactly do engineers “turn science into reality”?

By using their technical knowledge of science and math, along with equal doses of creativity and inventiveness, engineers first design something new (or improve the design of something that already exists). They then get involved in manufacturing or building that new or better-designed thing (“bringing it to life”). Finally, if it is a complicated thing (for instance, a power plant), engineers also get involved in operating and maintaining it (“keeping it alive and running” in tip-top shape).

What specific things do engineers design, help to manufacture or build, or help to operate and maintain?

Just look around you for the answers – cars, vans and trucks; roads, bridges and highways; trains, planes and buses; computers, cell phones and MP3 players; refrigerators, air conditioners and heating systems; etc. - the engineer’s “invisible hand” is present in almost everything that you and others use and depend upon each and every day. Plus a multitude of other things that are not as obvious: medical instruments, fire engines, farming equipment, food processing plants, sports equipment, musical instruments and recording equipment – and the list goes on and on!

It sounds like I can really make a valuable contribution to society as an engineer, helping better my community, our nation and the world?

You bet you can. From helping to provide everyday things that we all depend on (such as clean water and electricity) to creating the latest in cutting-edge technology (such as biotechnology and nanotechnology), engineers “make a difference” every day, serving in a very real way as the architects of the modern world in which we live.

So are all engineers the same?

No. Just like scientists, engineers specialize in a particular field (discipline), based on their academic training. So while the main types of scientists out there are biologists, chemists and physicists, in engineering the main types are civil, computer, electrical and mechanical engineers – about two-thirds of all students studying engineering earn a degree in one of those four disciplines. And again like science, there are many other fields that students can specialize in within engineering, such as aerospace, biomedical, chemical and industrial/manufacturing, which the next most popular engineering majors out there. So don’t worry, there’s an engineering major out there waiting for you!

Where can I find out more information about the different engineering fields:

Just visit The Online Guide to Engineering Schools at www.FindEngineeringSchools.org – you’ll find a brief introduction to each engineering major offered, as well as links to sources providing more information on each.

So what type of academic training do I need to become an engineer?

You'll need to go to college and earn a bachelor's (4-year) degree in engineering. Many engineers (about one-half overall) also obtain a master's degree, which takes an additional 1 to 2 years more to complete.

Can I study engineering at any college?

Unfortunately, no. Of the some 2500 4-year colleges in the U.S., only about 350 offer engineering as a major. However, at least one college in every state offers engineering as a major, so you won't have to go very far to study engineering.

How can I find out more about colleges offering engineering?

Just visit The Online Guide to Engineering Schools at www.FindEngineeringSchools.org – there you'll find a powerful search engine that can help you quickly identify potential colleges. You can then view detailed profiles of your identified colleges and their engineering programs, profiles which also provide extensive school contact information.

I heard that you need to be a math whiz to be an engineer?

While it is true that you will need to take more math courses than most other college students, plenty of today's engineers will tell you that they were far from math whizzes in school and struggled in their math courses, yet today they are making tremendous contributions as practicing engineers. So don't let your struggles at math hold you back from pursuing engineering.

I like biology, but I can't stand chemistry or physics, so I guess engineering isn't for me, is it?

Not so fast there. You don't have to like all the sciences to be an engineer – just one type will do! As we said before, there's a specific engineering major out there for everyone. And if you really like biology, check out biomedical engineering – it's the hottest field in engineering right now, attracting more and more students every year.

I thought only geeks or nerds become engineers?

No, you don't need a "pocket protector" to become an engineer! Take this quick quiz instead:

-- Would you like to use science to improve the world and create/invent new things?

-- Would you like to know how things work and use that knowledge to make them work "better, cheaper, and faster"?

If you answered "yes" to either question, you may well be a future engineer!

And to see real-world examples of who young engineers really are (and what they really do), visit the "Faces of Engineering" section of the National Engineers Week website (online at www.eweek.org).

Anything else I should know about engineering?

-- Engineers have reported very high career satisfaction rates, consistently exceeding those reported by lawyers and medical doctors, reflecting an underlying passion that engineers have for their work.

-- One important distinction separating engineering from many other professions/occupations is the amount of teamwork typically involved. Because of the complexities involved in many engineering projects, engineers with different expertise are often needed, so teamwork is an integral and essential part of engineering.

Where can I go for more information on engineering studies and careers?

Here are eight websites that offer a wealth of valuable information and resources:

Engineers Dedicated to a Better Tomorrow (www.DedicatedEngineers.org)

The Online Guide to Engineering Schools (www.FindEngineeringSchools.org)

Engineering Education Service Center (www.EngineeringEdu.com)

JETS (Junior Engineering Technical Society) (www.JETS.org)

Engineering K-12 Center (www.EngineeringK12.org)

TryEngineering.org (www.TryEngineering.org)

Sloan Career Cornerstone Center (www.CareerCornerstone.org)

Engineer Girl! (www.EngineerGirl.org)