

Interview with a Chemical Engineer

Many students find their way to *The Chemical Engineers' Resource Page* in search of a chemical engineer to interview for career research. We applaud these students and are happy to help in their quest to learn more about chemical engineering. The following are 17 of the most commonly asked questions.

1. How did you come to choose this career? Why did it appeal to you?

Actually, as with many college students, I changed my major course of study during my freshman year. I began college as a computer science major. I quickly found that computer science just was not for me. I explored the campus and found a course of study that combined technical thinking with a topic that had always interested me.....chemistry. As I learned more about chemical engineering, I just knew it was for me.

2. What kind of training or education did this career require and what college or university did you attend?

The training included a 5 year (sometimes 4 depending on the university that you attend) academic curriculum. I attended West Virginia University in Morgantown, WV. My classes included 4 units of Calculus, at least 6 of chemistry, some general engineering which included computer programming, thermodynamics, transport analysis, fluid dynamics, heat transfer, material and energy balance (2 classes), process control, chemical reaction engineering, separation technology, and chemical process design just to name some of the more important classes. However, at a university type setting, you'll also be required to take classes known as core requirements to make you a "well rounded individual". Mine included Theatre, Spanish, Criminology, Political Science, Geology, and Physiology....you get the picture. You can go to WVU's chemical engineering page at www.cemr.wvu/~wwwche/ and look under the "Undergraduate program" to see a complete curriculum there.

3. Are there any other skills beyond formal training that someone needs to do this job?

Your college training is just the beginning of your education. When you land your first job, you'll learn how the "real" world works. There are numerous skills that chemical engineers entering a chemical plant environment just do not know. You will learn many aspects of the business world, details of the equipment and process that you work with, and other "political" issues of the workplace. While the training that you receive in college is extremely important, I'd say that most people would agree that on-the-job training is where they learned the skills that made them a good engineer. These are all reasons why it's so hard to land that first job without any experience. In short, many people will know more than you and will be more productive much faster.

4. **How long is a typical work day? What time does your day end?**

I begin work at 8:00 A.M. and I generally finish between 5 and 6 P.M. I should mention that I now work in an office environment. I began my career in a chemical plant, but the hours were the same. The problem was that it was not uncommon to receive calls on weekends or late at night if problems occurred at the plant. I work this schedule five days a week (Monday through Friday).

5. **What is the starting salary or hourly wage for this job? Is there overtime pay?**

The starting salary is usually around \$45,000 per year but can be as low as \$38,000 or as high as \$50,000 per year. Most chemical engineers work on a fixed salary every two weeks or month. This means that they do not earn extra money for working more than 40 hours per week. Most employers are liberal with salary employees. For example, you may work 50 hours one week, and only 35 the next. Usually, I'd say that the yearly average works out to be near 40 hours per week, but some people prefer to (or are required to) work more.

6. **How can you advance your career as a chemical engineer?**

The best way for anyone to advance in their career is to separate themselves from other employees. Stand out, do something great! In general, the best ways to do this are to earn money for the company by finding ways to manufacture products cheaper, find unique solutions to complicated problems, or increase the efficiency of the way that you and others work. All of these will help the company that you work for perform better. It will also help you succeed.

7. **How much paid vacation time do you receive?**

I receive two weeks paid vacation, two "float" holidays, and two personal days. That's a total of 14 paid days off per year. During my fifth year of service with my company, I'll receive an additional 5 days per year and there are further increases the longer that you're with the company. Although some companies place restrictions on the number of paid sick days that one can receive, mine does not. We have a simple policy, "if you're sick, don't come to work" (this is not very common and people appreciate it and it is seldom, if ever, abused).

8. **Do you have a retirement plan? What is included?**

My company offers its employees a standard retirement package called a 401K. This allows employees to put money into an account (without being taxed) to save for retirement. My company automatically contributes 3% of my salary to this account and I can add up to 14% of my annual salary (up to \$10,000 per year) into the account. My company, additionally, matches 50% of the first 6% that I contribute. Essentially, if I save 6% of my salary, my company puts in 6% of my salary. Don't overlook the importance of saving for retirement when you begin your career. Young workers often begin saving too late and may delay their retirement. This money is later taxed when it is withdrawn after you retire.

9. Does the job have medical or dental benefits? Is it full coverage or is there a deductible or co-payment?

I have both medical and dental benefits. With the cost of healthcare, very few companies offer “full” coverage. I pay (very little) for these insurance plans and my employer pays the remaining amount. Most dental work is covered at 80% (check-ups and an annual x-ray are covered at 100%). I have a small co-pay for hospital and doctor visits, but under normal circumstances I have to visit my Primary Care Physician (PCP) and coordinate my care with her. To avoid the circus that healthcare has become....try to stay healthy :)

10. What are three things that you enjoy about your job?

I enjoy most everything about my job! I work as a design engineer for a company that supplies heat transfer equipment to the chemical industry. I also do some marketing and sales work as well. I guess I enjoy the following the most:

- a. The independent work environment (no one looking over my shoulder)
- b. Knowing that I'm directly responsible for helping my company to succeed
- c. Being able to travel anywhere in the US at any time that I choose

11. What are some things that you do not enjoy?

I spend a lot of time on the phone, which really is not my favorite thing to be doing, but it's important nonetheless. Sometimes, it can be hard to accomplish goals because of the “official” channels that you have to work through...this can be frustrating.

12. How long have you been working in this occupation? How long do you expect to remain in this field? If you are going to make a change, why?

I've been in my current position for two years now. I also working for another company for a year. I made the change because I really did not feel comfortable with my last employers. They did not encourage “forward” thinking at all. Creativity was not encouraged for fear that an idea may not work. This is not a good environment for a young engineer. I made the change and I've glad that I did ever since. My current employer goes out of their way to encourage new ideas and we're a better company because of it.

13. How much of a demand do you see for this occupation in the future?

When I graduated from college in 1998, there was a great demand for chemical engineers. Naturally demand goes up and down depending on the economy and how many people graduate each year. Generally, I'd say that there is always a need for good chemical engineers. Chemical engineers can perform many different functions. Probably why you don't hear of many chemical engineers who are out of work.

14. What high school classes are good for preparing to become a chemical engineer?

This is an easy question. While the classes are free, take as much math and science as you possibly can. They will only prepare you better for college and give you an advantage over your peers who will probably be very intelligent.

15. What advice would you give to someone considering this occupation?

Be ready to work hard to get through college. Don't get discouraged. If at all possible, DO AN INTERNSHIP, DO AN INTERSHIP, DO AN INTERSHIP. An internship will give you an opportunity to get some experience before you graduate. The field is very rewarding and you most likely will never have to worry about finding a job for the rest of your life. Instead, you'll only worry will be finding a job that you enjoy.

16. Where are job for chemical engineers available (rural, urban)?

Most chemical plants are found in rural areas, so to begin you're career, you may find yourself in a remote area. After you gain some valuable experience, you may consider a bit of a career change and may be able to land a good job in a more urban area (this is pretty much what I did). My first job was in rural South Carolina and now I reside in beautiful Richmond, VA.

17. Did you specialize in any topic in particular?

In school, I emphasized polymers (plastics) in my studies. This helped get me my first job in a polymer plant. Now I concentrate on heat transfer (one topic in chemical engineering).

18. How does chemistry enter into your profession?

For example: As a chemical engineer, you may have to separate water and benzene sometime....you had better know how the two interact chemically before you start. Do you know if they are miscible in one another? "Miscible" is a term used to describe two liquids that mix thoroughly....like water and alcohol. But water and oil are "Immiscible" in that the oil "floats on top of the water".....this is just one example of how chemistry is very important to a chemical engineer. If you're going to be responsible for moving, separating, and reacting chemicals...you better know about the chemicals and how they react to one another first! Some of the chemical knowledge will also come with experience. For example, if someone were to ask you how to remove caffeine from coffee beans, what would you recommend? Experience tells me that there are two basic, industrially accepted methods. One uses a solvent known as methyl chloride and the other uses carbon dioxide under extremely high pressure (supercritical carbon dioxide). The use of methyl chloride is an older method and requires additional precautions because methyl chloride is poisonous so one must be sure that it does not contaminate the coffee. Using supercritical carbon dioxide requires more expensive equipment, but the risk on contamination is no longer there because carbon dioxide is not poisonous to humans. Using carbon dioxide to



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decaffeinate coffee has been advertised as "natural decaffeination"....check out the label in the grocery store!

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