



# Sloan Career Cornerstone Center

## Profiles of Chemical Engineers



**Liza Munda**

**Associate Process Engineer  
Genentech  
San Francisco, CA**

### **Education:**

B.S. - Chemical Engineering, California Polytechnic State University, San Luis Obispo

### **Job Description:**

Associate Process Engineer

### **Advice to Students:**

"Keep plugging away. It's a rough road and we suffer a lot, but later on it pays off. It's really not the journey, it's the destination."

### **Interview:**

Munda: My name is Liza Munda. I'm an associate process engineer at Genentech.

### **Q: What do you do as a process engineer?**

Munda: I do drawing reviews, specifications of equipment, and design.

### **Q: When you say specifications of equipment, what does that mean?**

Munda: Specifying a piece of equipment is making sure that all the requirements, as far as utilities and finishes on the equipment, are sanitary. Basically, what the operations people require of a piece of equipment. We have to make sure that it can do what they need and, at the same time, be safe. It must be sanitary, clean in the area that they're going to be using it, and functional.

### **Q: How do chemical engineers fit into this?**

Munda: Some of the courses that we take, like unit operations, teach you how to specify pumps, heat exchangers, and other types of equipment. That's where you get some of your education. Then, at the same time, you have to know how to do calculations on different things that a certain piece of equipment might require-flow rates, fouling, and fouling rates.

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### **Q: How did you first get interested in being a chemical engineer?**

Munda: I actually think it was in high school. I was always pretty strong in math all through my education. When I went into high school, I had a really good chemistry instructor who made me want to go more into chemistry. My basketball and volleyball coach was actually a guidance counselor. I was talking to her at one of our tournaments and she said, 'What do you think you're going to do when you graduate?' I didn't think I knew, and I said I really liked chemistry, so she suggested chemical engineering. And I thought, chemical engineering, that sounds exciting-I could tell people I'm a chemical engineer. So that got me to look into it, and then I decided that's what I wanted to at least try when I went into the university. And when I started at the university, I just followed the path, not really thinking about anything else. Then, in my third year, I had a senior advisor who introduced me to biotechnology. He was starting a program at the university in biotechnology. I heard about Genentech, and came here to work.

### **Q: Has reality differed from what you first thought chemical engineering might be?**

Munda: For a while it was tough for me, because when I graduated I was told by my senior advisor that it would be really tough to get right into the engineering group. I'd probably have to start off in an entry-level position, something like manufacturing. He said most engineering professions require somewhere on the range of five to ten years of some kind of experience. What I didn't understand was how do you get that experience if no one's going to take you? So I decided to go ahead and work with Genentech. I liked what the company did and the culture that they portrayed when they came to recruit at my school. I got in and started working in manufacturing. I heard, 'maybe two to five years and then I could move into engineering.' So I said, that's fine, it's worth it to at least get my foot in the door. It kind of got me down, though, because I was slowly moving away from being in engineering work. I had some projects that did involve engineering but, for the most part, it was manufacturing, which in this company, is technicians who run the facility. They run the equipment and make sure that we get the product out into the market.

### **Q: How are you involved in biotechnology?**

Munda: We're involved with the equipment that produces all the drugs. We have scientists who create the process. They say we need to do this, that, and the other thing in order to produce this drug. Then they come to engineering and let engineering know that they need the equipment to produce it. That's where we step in. We design facilities that will have all the utilities that they need. We design the equipment. We make sure that it's aesthetically pleasing for operators-they won't have to reach two places to do the same thing at the same time. It's pretty exciting to know that we still get a part of the science because we are pretty involved with the process, since we need to design the equipment. And we still do the engineering.

### **Q: Who do you work with on a daily basis?**

Munda: We basically work with process scientists. They're the ones who developed the process to produce the drug. In the engineering group that I work in, I think that people do have the communications skills. We have to deal with sciences for validation, quality assurance, quality control, regulatory-even human resources when we need to go out and get extra help for our group. We deal a lot with outside contractors that we bring in to help us do

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some design work. Or they might be the construction folks who work on the facility. So it's important to have strong communications skills.

**Q: When you mention communications skills, what specifically are you talking about and how can a chemical engineering student get those skills?**

Munda: I think being involved in clubs helps, maybe being involved in things where you interact with a lot of people. Definitely in lab work. In labs, you tend to work in groups where you get some teamwork experience. I think being involved outside of that as well gives you a chance to interact with other people. That really helps. Going out and doing intramural sports, joining clubs, just being out and about. It's important to meet people and learn how to deal with them.

**Q: How can you learn job- and industry-specific communication skills?**

Munda: I think you can develop them in school and outside of school. I never took an internship when I was in university, but now I think it's really valuable because you get to learn what goes on in industry and interact with people on a different level, people who are actually professionals. As an intern, you might even deal with the contractors, depending on the company you work for. You get to see the whole gamut of people with whom you might be working. Just being out there and meeting people is really helpful.

**Q: How did you get your first job and what kind of steps did you take to ensure you did get that first job?**

Munda: Genentech came to my school to recruit. I went to the recruiting session and set up an interview with the recruiter, which is something standard that they do with graduating seniors. I had to fight for an interview, because they were mostly looking for scientists. They weren't looking for engineers and didn't post it as an engineering interview. But I talked to my advisor. I really wanted to interview with Genentech. And he said, go in there and see. So I did, and they asked me to come up here for an interview. I had only interviewed with one company when I graduated.

**Q: What kind of skills does a chemical engineer or engineer bring to this job that a scientist may not bring?**

Munda: For the position that I was going for, you needed to be technically oriented because you're dealing with a lot of equipment. I think they really viewed that as a valuable thing because, for the most part, you have a scientist who says, 'Yeah, I can do this and I understand the science and everything.' But when a piece of equipment breaks down or there's something wrong with it, they kind of scratch their heads and don't know how to go about troubleshooting. Whereas most people who go into engineering have a technical aptitude. So it's just the methodology of solving a problem and then having the technical aptitude as well. You have to like the technical end of things to be an engineer.

**Q: Have you thought about a long-term career path?**

Munda: I feel like I actually have come up to what I want to work on for a long time. I started in manufacturing, and after two years, my manager talked to the engineering folks over here, and

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my current director was looking for someone with a little bit less experience. So I moved from doing manufacturing technician things to an engineering career. Being an associate engineer, I have a long way to go to move up, but I think even being a group leader and having a couple of engineers below me to guide along would be pretty great.

**Q: Do you have a mentor?**

Munda: I do-my group leader, or supervisor, guides me along. I also have my director. They're both chemical engineers as well. I'm learning from what they know and from all their experience. I also use the other engineers above me a lot. I can go to anybody for any questions. It could be the smallest little dumb question and I could go to someone and spend a good half hour talking about it. Or, if not, then they can direct me to the right person.

**Q: What kind of courses did you take in college that you're continuing to use now?**

Munda: I basically use Fluid Dynamics the most, and Thermodynamics a little bit as well. Those are the two that I really use the most. Public speaking really helps a lot since we have to give presentations quite often. We have to head up meetings, and if you don't know how to speak well in public, you have to learn. You're going to have to learn somehow.

**Q: What type of things do chemical engineers do in manufacturing?**

Munda: Actually, there aren't too many chemical engineers in manufacturing. I know a couple of people who are chemical engineers right now in manufacturing, and it's basically knowing the unit operations and understanding how things fit together and work, how things heat up and cool down, and then being able to troubleshoot. Otherwise, you follow a set procedure all the way through. Then it's a matter of the way that you think things through.

**Q: What do you like about being a chemical engineer?**

Munda: I know that I'm contributing to the development of drugs that save people's lives, or at least improve the quality of their lives. If it's not a drug to cure something, it's a drug to improve the quality of their lives and that's very, very satisfying.

**Q: Do you think people understand what chemical engineers do?**

Munda: I don't think chemical engineering gets promoted nearly as much as it should. I think that people tend to focus mostly on mechanical, civil, and electrical engineering. Chemical engineers do a lot of things that I don't think people realize. Chemical engineers do things like develop new materials for clothing and running shoes. They also develop new types of foods, maybe diet foods, sugar free or fat free. The food industry is pretty big. Someone might create the newest alloy for a new type of bicycle, motorcycle, or automobile. I don't think people realize that. People probably assume that those are chemists, or when it comes to the actual hardware or things, it might be mechanical engineers. Chemical engineers are involved in that as well. I didn't find that out till later on in my university career.

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**Q: Is there any advice that you have for young potential engineers or young engineers?**

Munda: Keep plugging away. It's a rough road and we suffer a lot, but later on it pays off. It's really not the journey, it's the destination. People might look at it the other way, too. Definitely the destination is worth it because you get fulfillment out of the job that you do and you know that it was worth it. All the long nights that you stayed up, all the weekends you had to give up because you had projects to do, all the lab work you spent, it really pays off.

**Q: Was there any benefit or drawback to being a woman engineer?**

Munda: Being a woman engineer is tough in school -- and in industry as well. I think that there are now more female engineers coming out of school and I think people are learning more about engineering. It was really a challenge for women in school. I know that there were probably three out of 35 students in each of my classes who were women. The competition is pretty fierce between the women and the men. Then the women against the women, because you're the only women. You either stick together and work this through or you're going to dwindle. In the industry, what's tough is you have to work a little bit harder to earn the respect of the other groups that you work with. Construction, you have to work with a lot of construction companies. You probably have to work a little harder to get their respect because, for the most part, it's also a male-dominated field. They might look down on women a little bit more. But once you earn the respect, whether you're a man or a woman, things are fine.

**Q: Is there anything you might have done differently while you were in college?**

Munda: I would have taken an internship or a co-op assignment to help me understand what was out there, what was available in the industry. I never did that, and it's something I do regret.

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