Sloan Career Cornerstone Center

Profiles of Mechanical Engineers

Robert Rumford

Senior Associate Engineer
Lexmark International
Lexington, KY

Education:
BS, Mechanical Engineering, University of Evansville

Job Description:
Senior Associate Engineer, performing finite element analysis of computer printer components; makes recommendations to designers for modifications of parts.

Advice to Students:
"The best thing you can do for yourself is to make contacts in a professional setting. Often it's not necessarily what you know, it's more who you know, who they know, and whether they can put you in contact with people and companies that have jobs more suited to you."

Comments:
"When you're in college, it's hard to imagine what the workplace is really like or what you can learn by actually being there. It was valuable for me to see how people actually work, communicate, and interact in an office, and I quickly had to acquire and use those same skills."

Video Transcript 1:
"I was a theater major for, I guess, a year and a half, and then I realized that while theater was fun and I enjoyed doing it, it wasn't some-thing that would really feed me. I switched to business originally, and then decided that my best bet was engineering and I chose mechanical engineering because it's the broadest base of the engineers."

Video Transcript 2:
"As a mechanical engineer, I think the machine design class and machine analysis class that I took - and the finite element class also that I took - pretty much encompasses everything that I do in the normal course of my day. In terms of non-engineering classes, I guess just any class that you had to communicate in is helpful. English classes were also helpful, because we end up writing a lot of reports as mechanical engineers; and sitting in on meetings and giving presentations."

Video Transcript 3:

"It tends to be intensive. The work that we do, depending on the design cycle, is either really, really heavy, or it's really, really light, and so you end up putting in a lot of hours one week, and then maybe not so many the next week."

Video Transcript 4:

"So as soon as I graduated, I decided, well, I definitely want to go back and get my master's at some point, and that was also a big consideration with me taking the job at Lexmark, was that I could attend UK and they would help me out with it. I thought it was important for me to start grad school right away, so I wouldn't lose that momentum."

Interview:

Rumford: As a mechanical engineer I think the machine-design class and the machine-analysis class that I took, and the finite element class also that I took, pretty much encompasses everything I do in the normal course of my day. In terms of non-engineering classes, I guess just any class that you had to communicate in is helpful. English classes were also helpful because we end up writing a lot of reports as mechanical engineers, and sitting in on meetings and giving presentations.

When you're in college, it's hard to imagine what the workplace is really like or what you can learn by actually being there. It was valuable for me to see how people actually work, communicate, and interact in an office, and I quickly had to acquire and use those same skills.

During my visit to Lexmark, I met with everyone in the department where I would be working, and was really impressed with the people. Everyone seemed to enjoy their job and they were excited about what they were doing. In a number of the places where I interviewed, the people didn't come across that way.

The way I actually got this job was that Dave Buckle, my manager, graduated from my university. He came to the campus and met with my department head, and asked to see some resumes for seniors in the program. I got here through contacts with faculty and networking with alumni.

To me the most enjoyable aspect of the job is the rapid turnaround of projects. We often take a new project and turn it around in one to three days. We regularly deal with different problems that require new designs and parts. Every time that you complete an assignment and go back to the design team with your analysis and recommendations, it's very satisfying to know that your ideas contribute to the making of a better product.

Another aspect of the job that I really like is that I'm always learning. The company provides opportunities for continuing education and I am already taking advantage of them.

The best thing you can do for yourself is to make contacts in a professional setting. Often it's not necessarily what you know, it's more who you know, who they know, and whether they can put you in contact with people and companies that have jobs more suited to you.

The work that we do, depending on the design cycle, is either really, really heavy, or it's really, really light, and so you end up putting in a lot of hours one week, and then maybe not so many the next week.

Q: Start with your name -- your full name -- your age, your title, the company you're with. And say how long you've been employed here.

Rumford: My name is Robert Rumford. I'm 23 years old. My official title is Senior Associate Engineer, and I've been working at Lexmark International for three months.

Q: Bob, why don't you tell us a little bit about what made you decide to become a mechanical engineer? Was that a decision you made in high school, or is it something that evolved in college. How did that come about?

Rumford: When I was in high school, I thought that I might want to become an engineer, and so when I was applying to colleges, I looked at a lot of engineering schools around the area, and I guess about halfway through my senior year, I was in some advanced physics classes, in calculus and whatnot, and I decided there was no way that I wanted to do this for the rest of my life. And so I decided to major in theater, and I started college out as a theater major. I was a theater major, I guess, a year and a half, and then I realized that while theater was fun and I enjoyed doing it, it wasn't something that would really feed me. If I wanted to eat, I should probably get a real job. I switched to business originally, and then decided that my best bet was engineering and I chose mechanical engineering because it's the broadest base of the engineers. My thought was at that time was that I wanted something that gave me skills, that I could use, and no matter what job I ended up with when I finally graduated from college, I would have a good background, and I would be prepared to enter the workplace. And the other side of that was that I was interested in how things worked. I mean I didn't know how a refrigerator worked before I got to college and took thermodynamics, and it's just little things like that. I guess that's the reason I chose engineering as a field of study.

Q: How difficult was that transition for you?

Rumford: Well, I guess in high school I didn't have to study a whole lot. I just kind of skated through it. It wasn't any big deal. But when I was a theater major, we put in a lot of hours, but the work wasn't brain-intensive. I don't know if that's a good word to use or not. But I ended up probably spending as many hours in theater as I did in engineering, but hours spent in doing different things. Engineering was a lot more intellectually intensive and a little more frustrating. The transition wasn't too difficult because I wanted to make the transition and it was something that I decided I was definitely going to go do. But it wasn't hard, but it wasn't necessarily easy either.

Q: So how long did it take you to finish school in total?

Rumford: In total? I graduated in five years. So I got out easy. I didn't do a co-op or anything. I interned over the summers. But I didn't have a co-op, and so I went pretty much five years straight through.

Q: What about your internship? What did you do for your internship?

Rumford: For my internship, I spent the summers between my junior and senior year, and the summer before that also, interning with ASME in New York and I guess that was sort of an office-type position. I did some programming and some spreadsheet designs and forecasting and whatnot. That was a really good experience. Just being in New York was a good experience.

Q: And what skills did you acquire, that were a taste of the real world? What do you think you got out of all that?

Rumford: When you're in college, it's hard to imagine what the workplace is really like, and no one can really tell you what it is until you're actually there, and so in that regard, it was really good. It let me see how real people actually worked, and I also think the communications skills, and the interaction, that take place in an office were really valuable for me to learn and to experience.

Q: How well did you feel prepared to go into the working world?

Rumford: You know there's nothing quite as scary as graduating from college and actually having to face the real world. I think college did a good job in giving me skills and a background that I could work with and use in my professional career, and I guess I was ready when I graduated. I mean I'm still learning now, and I probably will continue to learn until I find a different job or move into something else.

Q: What subject areas that you studied in college as an ME do you use the most? Actually, it doesn't have to be limited to your engineering degree. What do you find you draw on the most from your formal education?

Rumford: As a mechanical engineer I think the machine-design class and the machine-analysis class that I took, and the finite-element class also that I took, pretty much encompasses everything I do in the normal course of my day. In terms of non-engineering classes, I guess just any class that you had to communicate in is helpful. English classes were also helpful because we end up writing a lot of reports as mechanical engineers, and sitting in on meetings and giving presentations. I guess it's more of a broad-based background that you get in college, as opposed to one specific area.

Q: Bob, can you summarize what Lexmark does. I know what your job title is, but give a description of your job, what that really means to a layperson who's not here at Lexmark.

Rumford: Lexmark International makes computer printers and information supplies, computer supplies. The job that I am doing is computer-aided engineering, essentially. And the term that's thrown around is finite-element analysis, and basically what that is, is taking a complex part, breaking it up into a grid, composed of nodes and elements, and you apply forces or you hold it in certain places and the computer runs through an algorithm that will tell you where the high-stress areas are in the part, where and how it's going to deform. And then, basically, we interpret that information and use it to make recommendations to designers on, “Hey, you need

to thicken out this part because you don't have enough material here, or you have too much material here, it's going to break." And just kind of help them out with their design in an effort to reduce costs in terms of materials, and also to ensure the quality of the product and customer safety and satisfaction.

Q: Why don't you go through quickly a typical day for me? What do you tend to spend more time on? More time on the computer, more time in meetings, on the phone? Kind of walk me through, if there is such a thing as a typical day for you.

Rumford: Usually, I get here in the morning and I check my E-mail, all my messages, and write out replies, and check my phone mail. And then I usually come in, and if I have a project to work on, the majority of my day is spent in front of the computer, running analysis, trying to determine what kind of conditions to apply and how to analyze the part. I would say maybe an hour out of my day is spent in meetings, and then the rest of the day would either be spent writing reports or just doing general-education type stuff. It tends to be intensive. The work that we do, depending on the design cycle, is either really, really heavy, or it's really, really light, and so you end up putting in a lot of hours one week, and then maybe not so many the next week.

Q: But there are no typical hours for you, basically?

Rumford: Not really. Generally speaking, I work between 8 and 5, and take an hour off for lunch. But that fluctuates a lot.

Q: In your area, do you tend to work more on your own, or do you work closely with other people on a team? How does that work out?

Rumford: Generally, the way it works out is I meet one-on-one with the designer or a group of designers, and they explain the problem that they have and the part that they want me to look at. And I take that back and analyze it, and generally, I get the input of the rest of the numbers on my design team, which consist of four other people, and we look at the part and decide, "Are they valid results, and what can we do to improve the design?" and then go back and meet with the original designers. So there's a lot of interaction going on, but most of the work is done on an individual basis.

Q: Who are those four other people that you would talk to? Are they all mechanical engineers? What are they?

Rumford: They're all mechanical engineers.

Q: And so you strictly work with other mechanical engineers.

Rumford: Yes.

Q: How did you happen to get your job here at Lexmark? What brought you to the Lexington area? I know you're not originally from here.

Rumford: Right.

Q: So tell us a little bit how that worked out? How you networked or what tools you used.

Rumford: At the end of my senior year of school, I was hunting desperately for a job, and I thought for a while that I'd be living under a bridge in South Jersey. But it didn't work out that way, fortunately. I had a lot of different interviews that I went to at the end of my senior year, and at the same time a lot of my professors were encouraging me to go on and go to grad school with the philosophy that if any one wants you now, then they can wait two years and you'll have a Master's degree and you'll have better technical skills. The way I actually got this job was Dave Buckle -- my manager -- was a graduate of the University at Evansville, and he came down to Evansville and met with the Dean of Mechanical Engineering and said, "OK, basically, who do you have in your department and let's see some resumes." They went through them and, fortunately, the dean gave me a good recommendation, and Mr. Buckles called me that next week and said, "Can you come to Lexington for an interview?" and so I came up for an all-day interview. It was right around finals time. I met with everyone in the department that I would be working with, and I was really impressed with everyone here at Lexmark. Everyone seemed to enjoy their job and was excited about what they were doing -- which at a lot of the places I went to and interviewed, people didn't. It seemed they spent more time sitting around the copying machine, complaining about stuff, than they did actually working. So basically, I ended up getting the job on the recommendation of one of my professors and there's some networking, and I guess the University of Evansville Alumni network.

Q: What about, Bob, I know you had mentioned last night that you were going back, starting graduate work, already. What made you decide to do that so quickly, and why do you think that's important, and how has that been so far?

Rumford: One of the things I decided when I did graduate from undergraduate was that I wanted to go and pursue a graduate degree, because I felt that undergraduate gave me a good basis, a good foundation, but I was just getting to some things and some topics that were interesting, and that I knew enough and had enough background in that I could pursue. So as soon as I graduated, I decided, well, I definitely want to go back and get my Master's at some point. That was also a big consideration with me taking the job at Lexmark, was that I could attend UK and they would help me out with it -- University of Kentucky. And so classes actually start tomorrow, so I'll let you know how grad school goes. But I'm excited about it, and I thought it was important for me to start grad school right away, so I wouldn't lose that momentum, because it's really easy to go home from work at the end of the day and fix dinner and then sit in front of the television and just "veg- out." And so I wanted to get started, back as soon as I could.

Q: Did you take the FE exam? The Fundamentals of Engineering?

Rumford: Yes, I did.

Q: The IT.

Rumford: I did take the IT, and I just found out last week, actually, that I passed it.

Q: Congratulations.

Rumford: So I'm going for my PE in a couple of years I guess.

Q: What do you think, Bob -- I know you've only been here three months -- what do you see the rewards of this position being? The part that makes you feel good, like at the end of a day or at the end of the project? What specific things? Has there been a specific project that you've worked on?

Rumford: I think the most rewarding aspect of the job is the fact that there's a high turnaround. I mean we'll get a new project, and typically, we'll turn it around in one to three days, and so you get to see a lot of different things and a lot of different parts, and every time you complete that, every time you give the results back to a designer and you say, "This is what I suggest you do, or your part's fine," it's a really satisfying feeling, that you've somehow contributed to the making of this printer. And it's rewarding in that, and the job is challenging, and it's not one of those boring, no-brainer jobs, and so that in and of itself is kind of reward, when you can go through and figure out a problem. I think the other aspect of the job that I really like is the fact that I'm always learning and the opportunities for continuing education are there, and I'm trying to take advantage of them. And so I guess all those things, kind of make the job worthwhile.

Q: Who has influenced you? It sounds like you had people at Evansville, anyway, whom you really spoke to about the career path. Who was probably the most influential person, that's helped you get to where you are now?

Rumford: I don't know if there's a single person, but I would definitely say that my professors at the University of Evansville were really helpful. I don't know how many different times I would sit down with a professor and just say, "So, really, what do mechanical engineers do?" And I would talk with them about grad school and whatnot, and they were really helpful, and they gave me a lot of direction and a lot of encouragement.

Q: What about ASME? Were you active as a student member at ASME or not really?

Rumford: I belonged to ASME as a student member, and unfortunately, I kind of wish I had done more with ASME while I was there. I did a couple of the design competitions and went to the meetings on Tuesdays and got free pizza. But I think there was a definite opportunity where I could have done more there, and I think if I had, I really would have enjoyed it. That was probably my only regret, going through college.

Q: What do you think a professional society could do to help students?

Rumford: I think the contacts that you make in a professional setting are the best thing that you can do for yourself because it's not necessarily what you know. It's more who you know, and if one person knows someone else, then maybe they can put you in contact with them and maybe that job is more suited to you, for you, than something that's you wouldn't know about normally.

Q: Bob, what about outside of work, things that you enjoy doing? Give us an idea of what you do with your spare time?

Rumford: Typically, when I get home from work I take a nap, actually, to be truthful, and then I usually fix dinner and I either go out and work out or play tennis or play basketball. Usually, a couple of guys from Lexmark get together and we play volleyball a couple of times a week. I like to read. I've taken up painting. I'm not real good at it, at this point. But it's fun, and it's enjoyable. Usually on weekends, I'll go hiking or camping or just kind of touring around, sightseeing and whatnot. It varies. But I guess I don't spend a lot of time watching television. I have one, but that's about it.

Q: What about a computer at home? Do you have a computer at home? Do you spend a lot of time on your computer at home?

Rumford: I do have a computer at home. I don't spend a lot of time on it, just because I pretty much spend eight hours a day starting at one at work, and so the last thing I want to do when I get home is look at another computer screen.

Q: What about your family life? Do you think that contributed, how you were raised, to your dedication to being educated or pursuing all these things?

Rumford: I think my parents and my upbringing had a very positive impact and probably got me where I am now. But in what ways? It's kind of hard to say. It's just a general preparation for life, I guess.

Q: What do you think makes a successful mechanical engineer?

Rumford: I think the most important thing in being a mechanical engineer is you have to be willing to work really hard and spend long hours figuring out stuff that's pretty tough. Intelligence helps. But it's not always necessary. I have a lot more respect for someone who's willing to work hard enough to work through a problem than someone who can just get it off the top of their head. I think that's probably the key, is hard work. And the second thing that you probably need is dedication. You have to be able to see something through. A lot of the problems that you do in undergrad, they take a long time to do, and you have to make yourself do it, and you have to be disciplined enough to get through it, and it's not always fun at the time. But when you finally do get the problem done, and you reach a solution, it's really rewarding and it's satisfying.

Q: I know Lexmark is an international company. Are you involved in any international projects?

Rumford: Not at the moment.

Q: Do you feel that you have a lot of input in the decision-making process around here? Do you feel it's democratic? How are things run around here? Especially as the new guy?

Rumford: I think when I do decide to speak, people do listen and they take what I say into account, which is kind of a nice thing, especially just being an undergraduate and the four other guys that I work with all have their Master's in mechanical engineering and some of them have MBAs also. And so it's kind of nice to have that, that they respect what I say. But I am low-man on the totem pole, I feel like at this point, and I've been here three months, and I expect that will change. It's a big company, but it's managed and it's organized as a smaller company along team lines, and so I think within the team, an individual has a lot of input and what they say does count. It doesn't get lost somewhere.

Q: What do you think is most important for students, engineering students, to do while they're in college, to kind of get a jumpstart on the real world? What do you think that you did or you didn't do, that would be important for new students to know?

Rumford: I would say get involved in anything, really. Your local ASME chapters are probably a really good place to go because it gives you experience outside the classroom. If you go to a design competition, you're actually making a part and you're seeing it all the way through, and that's something that you don't necessarily do within the classroom. I would also say take computer classes. I know as an undergraduate that wasn't necessarily part of our program. But if you intend to go onto grad school, computer classes are a plus. Programming languages specifically, C++ or Fortran. And talk to people. Communication skills are probably the most important thing a mechanical engineer can have, and it's probably going to get you the furthest in your career, as well as in social life.

Q: Do you find it a challenge, Bob, to do things for yourself? Like do fun things, like get a chance to go golfing, and still be good at work and put in the hours you put in. Is that difficult for you?

Rumford: I think in order to be good at work, you have to take time for yourself, and normally I'm a really quiet person, and I guess most mechanical engineers are, and so I like to have a lot of time for myself, you know, just walking in the woods or what have you. But I think in order to be effective at work and to really do well, you have to have that there, and you have to have some sort of outlet that you can go to, to relieve stress. If it's working out or playing basketball or hitting a punching bag or whatever, you've got to have somewhere to go, and so I think it's important that you develop things that you can do in your free time and not just sit around like a couch potato.

Q: So how do you like working so far? What's your take on it?

Rumford: From school -- just because the schedule is different -- the thing that I didn't realize how much I missed until I actually didn't have it was a nap after lunch. You know, I mean, in between classes you only go to class three, five hours a day, and the rest of the time you spend working. But it's broken up, and you're in different environments, and you walk into different classrooms. You're talking with different people. But at work, you're in your office or you're in a lab or something pretty much most of your time, and it varies. But it was hard the

first week or so, just to get used to spending eight hours in one building or in one place without having a lot of change of scenery. The thing that I'm finding now, after the initial excitement has worn off, is getting up. It's getting tougher and tougher. When I first started working, I got in at 7 o'clock and stayed till 6, and most of the time I spent trying to learn the programs that we use. But lately, I'm struggling to make it in the door by quarter till eight. And I still stay late, but it's getting rougher, but I'm going to start grad school and so I'll be on a different schedule. That'll hopefully keep things interesting.

Q: So you would just say it's different.

Rumford: Yeah. I think it's easier, actually. I think being out in the real world's a lot easier than being in school. You don't have to stay up until 4 in the morning, trying to crank through a problem and get two hours of sleep and go to class for another 12 hours. And you leave your work at work, usually. You stay until it's done. But once you're done, you're done, and that's it. And so in that regard, it's really nice, and I feel like I have a lot more freedom to do what I want to do. That's kind of nice, too. But again, I wouldn't take back a second of undergraduate either, and there's always something going on. Didn't sleep a whole lot, but.

Q: Had a good time.

Rumford: Had a good time.

Q: Any other last words of wisdom? Something you wish maybe someone had told you? When you were a freshman, sophomore?

Rumford: I would say while you're in school, enjoy it. There's more to being in college than just going to classes and doing homework. That's all important. But being involved in outside projects, doing an independent research project, or any research project, you know getting involved with campus organizations, and just having fun, I mean going out and hanging out with your friends, is probably the best thing you can do for yourself as an undergraduate and in preparing you for the real world. So take the time, enjoy it, because too soon it's all over and you're out, you're out in the real world, and it's a good place to be, but college is a lot of fun. So have fun.