



The College Spy® Podcast with Michelle McAnaney

Episode 9

Great Advice for Future Engineers: An Interview with Sol Rosenbaum of The Engineering Mentor

Welcome to The College Spy Podcast, a podcast for parents and students addressing all aspects of the college selection and admissions process. I'm Michelle McAnaney, the founder of The College Spy. We offer college planning services to students and families across the United States and internationally. We are a team of dedicated educators who are committed to helping students and families identify the right colleges to apply to and get accepted. We offer our guidance and expertise in a way that improves student performance, increases confidence and promotes college readiness and maturity. The College Spy works with all students including students interested in the STEM fields, students with learning differences, international students, and third culture kids. To learn more about The College Spy, visit our website at thecollegespy.com and follow us on [Facebook](#), [Twitter](#), and [Instagram](#).

Welcome to episode nine of The College Spy Podcast. This episode includes my interview with Sol Rosenbaum, an engineer and the founder of The Engineering Mentor, The College Spy's Tip of the Day, and a college spotlight on Rose-Hulman Institute of Technology.

After receiving his bachelors and masters in mechanical engineering, Sol Rosenbaum moved into the energy engineering world and has worked in this field in one way or another for over 20 years. He is currently the owner and managing engineer of a small firm that provides energy engineering and engineering review support within the mortgage finance industry. He also has a passion for mentoring younger engineers and founded The Engineering Mentor in an effort to assist the next generation in their engineering journeys. I really enjoyed speaking with Sol about the soft skills engineers need that aren't taught in college, as well as various factors a high school student could consider as they search for a perfect college, such as ABET certification and the ability to sit for the professional licensing exam. We also talked about whether or not selectivity is important when choosing an engineering program.

Michelle McAnaney:

Sol, welcome to The College Spy Podcast. I'm so glad you're here.

Sol Rosenbaum:

Thank you. Happy to be here and help out your audience.

Michelle McAnaney:

Thank you. So, give us some background on what you do as an engineer and let us know a little bit about your journey from college student to engineer.



Sol Rosenbaum:

Absolutely. Well, I graduated with my mechanical engineering degrees and I went to a job that, honestly, I thought was going to be MEP design work. Obviously I was a little bit naive about what the job actually entailed because we did a lot of the MEP work, a lot of HVAC design, but it was really within the energy efficiency space. And that's where I have been in one way or another to the past 20 years. I've been in various roles with pre-project engineering, business development, to the point that I ended up opening my own firm. I now work within the mortgage finance industry, still doing a lot of energy efficiency projects, often tied to various green loan programs. And I also do engineering support for property commission assessments, which is essentially the commercial version of a home inspection. And I also reached a point where I saw that mentoring for younger engineers was really lacking in the field. So, I also have a passion for mentoring younger engineers. To some degree, it's a side job, but I feel like it's something that is all encompassing and affects everything that I do.

Michelle McAnaney:

So you have your own engineering firm and then you have a, what you're calling a side job, called The Engineering Mentor?

Sol Rosenbaum:

Yes.

Michelle McAnaney:

Which is what attracted me to invite you to be on this podcast because a lot of the students that I'm working with are planning to become engineers. They're in high school and I don't know that everybody realizes that there's a need for mentoring for engineers. Can you talk more about it?

Sol Rosenbaum:

Absolutely. I think that a lot of people get into a job and there's a great mentorship program set up within the company. They have a way to take somebody from really just what I call the young and dumb engineer, and I don't mean that in a bad way. I was the same way. When you start off, you don't know anything. To get you to a point where you're really a productive member of the team, some places have a rotation. They really have a very formal mentoring program. Other places, such as I experienced, really just team you up very closely with senior engineers who help you along the way. And I honestly thought that was the norm, that everybody had that experience until several years into my career when I was talking to some other engineers that were give or take at the same experience level. And they were just blown away, like, "wait, you actually had somebody help you out there? You had somebody to guide you?" And it was at that point that I realized "wait, this is really lacking in the field." Yet it was something that I know if I did not have that mentoring and guidance in my career, I would not



be where I am today. So I kind of took what I was doing informally, just helping out some engineers in my firm in general, to something bigger where I can reach a broader audience.

Michelle McAnaney:

Is the engineering mentoring that's being offered either a little bit more informally at a smaller engineering firm like you were referring to, or a more formal program, are they mentoring the new engineer in engineering the hard skills or more the soft skills?

Sol Rosenbaum:

It's a little bit of both. I think that most places are going to focus on the hard skills because engineering school is a great foundation for your engineering career, but you're not going to learn everything that you need for the career. I have so many energy engineering formulas flying around my head, so many different variables that I consider on a project that were never touched in any of my classes. So not to discount engineering school, but for my knowledge skillset, it's not enough. You're definitely learning the hard skills. The soft skills are going to depend on really your team structure, the culture of the company, and a little bit of whether you see the need in it, so you kind of push for it. For example, public speaking, if you see the need for it and you tell your boss "Hey, I'd like to present at a conference", I'm sure they would love that. That's a way to get their company out there, but they may not have it internally as something that they want you to do.

Michelle McAnaney:

Do you run The Engineering Mentor mentoring young engineers right out of college or up until five years after college? Who are you helping?

Sol Rosenbaum:

So, my primary demographic, it used to be just younger engineers, I would say from graduation through three, four years into their career. What I found is that, especially when it comes to networking and also starting to set up the beginning skills, when it comes to the soft skills, it really helps if you do that while you're in university. So really, my demographic now that I'm trying to help is students from freshman year through that three, four year career mark.

Michelle McAnaney:

And I don't think that the engineering schools are providing these soft skills. I don't think that's what they're teaching engineering school at all.

Sol Rosenbaum:

No. I think that not only are they not purposely teaching it, but I think that sometimes when you look at a liberal arts degree, you find that they might get writing skills just through a history class because that's the way you present the material, or they have to give an oral report about



a various subject. But when it comes to engineering school, I think the only time I ever did a public speaking presentation was during my senior capstone project, and even that was, honestly, the presentation side of it was a bit of a joke. It was really more of a check-in for the professor to see that every two weeks you were doing something, that you were moving along, and it was more of a progress report than anything else. And I'll tell you, the way I got into public speaking initially was purely looking for an easy a. And a friend of mine told me about a public speaking class in university and said, "Hey, why don't you go take this class?" And so I took it because I wanted the easy A and had no idea that would actually help me in my engineering career.

Michelle McAnaney:

What are the skills that young engineers are lacking that they need and you're working on?

Sol Rosenbaum:

Well, I would say, as I mentioned, public speaking is a big one, and for all the people who have no interest in being Tony Robbins and they kind of push public speaking to the side, don't push it to the side because if you're speaking in front of your own department, you're giving a progress meeting or you're meeting with two or three investors or even with an interview, the skills that you learn from public speaking can really help you out in that side of things. So certainly public speaking is way up there. Networking is very important. One of the things that I like to present to the younger engineers is the concept of preparing that network well before you need it, very similar to hurricane preparation. If that storm is starting to make landfall, you don't want to all of a sudden think "oh, you know what? I'm going to go to Home Depot, buy some wood for the windows, go out and buy a generator, stop and get some gas for the generator, and then stock up my fridge." At that point, you're in trouble if you do that. So I say build a network up slowly. Have a quality network and just put it aside for that potential eventuality. Other skills, you know, negotiation skills, sales skills, writing. These are all within that soft skill realm that every single one of them, the more of them that you have at your disposal, that can really help you in your engineering career, particularly for mobility within jobs. Because if they can see you going to another role where it includes these extra skills and you already have them, you're going to be considered for that position.

Michelle McAnaney:

I work with a lot of high school students interested in becoming engineers and other things, but many of them that are interested in becoming engineers and I would say at least half of them, if I sat down and talked to them about the importance of public speaking, networking, negotiation, sales, definitely writing, they would feel either overwhelmed or there would be resistance from the student. Because when they're seeing themselves as "I'm going into engineering", what they're looking at, and the reason why they'd be good at it is, "I'm great at STEM, I'm great at math, I'm great at science, I'm interested in physics." What are your



thoughts about that? About the young student who really wants to study the work of an engineer as opposed to the skills that are needed to advance in your career?

Sol Rosenbaum:

I think that there's two sides to this. First of all, these soft skills are not going to come instead of the hard skills. If you come into an engineering job and you're a great public speaker, but you can't do the actual technical work, they're not going to hire you. This isn't a sales position where you only need to know some peripheral knowledge about the engineering. You have to know the hard engineering. So that's going to come first and foremost. And these are skills, you're right, it's a lot to learn, but I think so is becoming an adult, starting to learn how real life works, and recognizing that an engineering career is a lot more than just the science and math. For example, a lot of people have this notion that "okay, you know what? I'm going to work as an engineer for a little while and then I'll get promoted on my way up and become an engineering manager". And they have this notion in their head that the best engineer, is the one who gets promoted to manager, which does happen, but the best managers are not necessarily the best engineer because of the different skillset. You have to understand budgeting. You have to understand interpersonal relationships. You have to understand how to schedule things out within your team. You can have great engineering skills, but if you don't come along with those as well, you're not going to be a very good manager. And that's why I come back to the point about career mobility and options. You do not have to learn all the soft skills. You can have a successful engineering career without them. I'm not saying that you must learn them. And, of course, there are engineers that sort of hide off in the corner and sit at their computer all day long. And they're happy with that, that's fine. But if you want to have more options and more mobility, these are skills that often come into play.

Michelle McAnaney:

So, how do you help people through The Engineering Mentor? What does your program look like?

Sol Rosenbaum:

Right now, I don't have a lot of formal structure with it. I have a website where I share various articles on topics related to soft skills, I have a free newsletter that I send out along with those same ideas, and I also run a networking course every few months to help them out.

Michelle McAnaney:

What is your website? Tell everybody so that they can jot it down and go to it.

Sol Rosenbaum:

TheEngineeringMentor.com



Michelle McAnaney:

Sol, I have students who are interested in applying to college for engineering. They know they like math and science. They don't particularly love English and history, usually. But what I find when I talk to them about engineering is that they don't really know what it is. I think they've been advised by other people, you should look into engineering because you're good at and like these subjects in high school. What advice do you have for students to figure out what actually is an engineer and to determine whether they'd really be a good fit for that career?

Sol Rosenbaum:

I think a lot of it is talking to engineers. Reach out if you have within your sphere. Go talk to the engineers. Ask them what they do every day. I think a lot of younger kids, especially high school students, well actually you're right, I think they would be very surprised with what an engineer does all day. For example, when I was working as a project engineer, there were days where we would be literally climbing around a mechanical room, taking measurements of the various equipment, talking to the people there about how they operate the systems. From there, we could then design new systems based on how they're going to utilize it and also the exact space. So it's more than just straight math. And the truth is also if you find that you get into engineering school and yes, people who are generally math and science interested get pushed into engineering. But you'll find that a lot of the math in engineering school, you may not like it as much, and that's okay. You can avoid a lot of it. Personally, I hate calculus. I haven't touched it since some of my licensing exams. I'd say it was probably about 15 years ago. You can avoid some of that stuff, and I think that would come as a surprise to a lot of high schoolers that if you want to use it, yes, there are certainly engineering jobs that utilize it, but you can also avoid certain subjects. So yeah, talk to engineers about what they do. I think it's also important to know whether you want to be an engineer that works in the office, or whether you're an engineer that actually goes out into the field and is hands on with some of the work. Because there's certainly opportunities within both, or to combine them into like a bit of a hybrid model.

Michelle McAnaney:

You mentioned that you took licensing exams. Can you talk about being a licensed engineer? I'm not sure that our audience, that they're thinking about that step. And when does it come in your career as an engineer, how far into it, and why you might pursue it or not?

Sol Rosenbaum:

So this is all within the US market that we're talking. The license that I'm talking about is a professional engineering license and it consists of three essential steps. You need to have an ABET accredited engineering degree. You need to pass the FE/EIT exam, that's the fundamentals of engineering exam, and you become an engineer in training. And then depending on the state, because the EIT is a national exam, the professional engineering is



state by state. But generally you have to wait four years working under a professional engineer and then you can take the professional engineering licensing exam. It's a bit of a mix of who takes it. For the most part, civil engineers take it a lot. Mechanical engineers will take it a little bit less than them, and then there's electrical power people who take it to an even lesser degree. Essentially, what the professional engineering license allows you to do is sign off on drawings, and it's generally things that are connected to the public good. So that's why you have civil engineers that are signing off on drawings for buildings, bridges, those types of things. A mechanical engineer, there are projects where I've worked on that required a professional engineer, but I didn't necessarily sign off on it. For me though, having my own firm, it was very important to have that license. And I saw early on that I was probably going to move in that direction. So even if you don't officially need it, it's one of those licenses that gets your foot in the door. And here's my words of wisdom, if you take anything away from this, if you are qualified to take the FE exam, which usually happens when you are a senior in engineering school, take it right then. Even if you don't see yourself getting the professional engineering license, take the exam then, because that exam is based on your four years of undergraduate studies.

Michelle McAnaney:

One of the things that you mentioned as you were explaining this is ABET accreditation, and I wonder if we could talk a little bit about that and also about selectivity of colleges because I have a lot of families who are trying to figure out which engineering school would be good for them. And when I say you want to find one that's ABET accredited, when they're new to studying this, they're not familiar with ABET. And the other thing that is confusing is, how important is it to attend a school that's very selective? And I think you'd be a good person to talk about this because you are a graduate of Columbia University, an Ivy League University in New York. So what are your thoughts?

Sol Rosenbaum:

So the first part is with the ABET accreditation. I do know that ABET has their qualifications of what a school has to do, and every few years they will come back and check the university to make sure they are up to par. I'm not giving an opinion on whether this is a good thing or a bad thing. I think probably overall it's a good thing, but I will tell you that if you go to a non-ABET accredited university, it hurts actually. I know that the PE, it's harder to get that license. There are engineering companies that won't hire you straight off the bat. So not that you can't get a job with it, but it can create some roadblocks. So if you are considering a non-ABET school, I would look into that further. When it comes to selectivity, some people at Columbia might not want me to say this specifically, but the actual education that you are going to get from a top tier school versus the actual education you're going to get from a non-top tier school is going to be pretty much identical. They're both going to be ABET accredited. They're going to have the same education. The difference that you often find in a top tier school is sometimes they have



more money and they're getting more grants. So from the research side of things, you might have more opportunities to get involved with that. The other thing is that the average person who goes to a top tier university is likely going to have greater success, is probably a smarter as judged by the universities. Throw in there the cost of some of those schools and what opportunities that avails itself. So I think the advantage that some of the top tier schools can give is when it comes to networking and where those people who are in your class or other alumni, where they're going to end up and how they can help you in your career. But it's not something that you have to go to the top tier school to get those connections. It just might be a little bit easier.

Michelle McAnaney:

I talk about that often with students, about the caliber of students that might be sitting around you in class is different. They did different types of courses perhaps in high school or got different grades in high school. This is a big topic in my field: how important is it to go to a selective, you say top tier, I say selective, just so hard to get into university and I think often the answer is it depends on your field, what field you're going into. And it sounds like with engineering, in terms of education, it doesn't matter.

Sol Rosenbaum:

No, I don't think it does. The other thing that is very important, and this is a concept that Malcolm Gladwell talks about, where a student went to a highly selective university and basically fell flat on their face. They looked around, and I suffered from this a little bit at the beginning. You look around, and you're like, "Wait, am I the only one who finds this class hard?" Because you're in a room where everybody is really at the top of their game. And what he found was that when that student, when she moved to a less selective university, she was able to thrive there and really just be a little less stressed out about her classes, really have a connection with her professors, and in that environment she did much better than she did in the highly selective university. Because, at the end of the day, it's not a joke to go to any engineering program, but if you're going to go to a highly selective university, not have a good GPA, you're not going to have any extracurricular stuff because you're just really overwhelmed, in that case, you're much better off going to a less selective university where you can, it's not relaxing per se, engineering school, again, is hard, you should be ready for that, but you're not going to be under the same stress that you would be in that highly selective university.

Michelle McAnaney:

I find that my students who are going for engineering, who attend schools that are a little bit less selective, receive a lot of support from the schools, a lot of academic support and social support. So for example, I had a student a while ago who went for engineering at Western New England College, which is a small school in Massachusetts. And was really struggling with the first year of calculus and they allowed him to audit the rest of the class and retake it the second



semester. I've heard back from families that I've worked with at other schools where it's not cutthroat as much as it is supportive. What did you find at Columbia? I know we're talking back in the nineties and it might be different now, but was there a lot of support?

Sol Rosenbaum:

Right. I think from other students, I think it was fine. We had study groups that worked well. I did have a real mix of professors, some of them were really good and some of them were really top researchers, or they were experts in their area, but they weren't very good professors. And I think that is something that I've definitely heard from other people, anecdotal that in universities that are not as pressured to have the publishing, or not as pressured to have the research, they really focus on the students a lot more. And especially for the students that really need that extra support that can be very useful. The other thing that I have found across the board, everybody who I've spoken to, is that you need to take advantage of your professor's office hours. Because even that top research guy, like I had one class that I remember was ridiculously hard in my master's program, and this happened to be a professor that I also had an undergrad, he was not that great of a professor, but when I went to him one-on-one in his office hours, he was wonderful. Like he knew the topic so well, but he was able to explain it on a level that I was able to grasp it and move along. So for anybody, regardless of the university that you're in, take advantage of those office hours you're paying to be there, make them explain it to you if you don't understand it.

Michelle McAnaney:

It's good advice. It's not advice that students often use. I talk to them a lot about "how important is accessible professors to you" as we're searching around for colleges and looking for which colleges to put on your list. And the kids are like, "well, I'm supposed to say that's important to me, that makes sense." And so when we scratch at it a little bit further, what I say is "what do you do when you don't understand right now in school? Where do you go?" And so for the students who will go straight to the teacher for help, they want accessible professors. That's important to them. And they're likely to knock on their professor's door for office hours. But I have a lot of students who will tell me "well, first I'm going to go to YouTube, or I'm going to go to a peer. And then maybe as a last resort, I might check in with the teacher." And those are the kids I think that we really need to encourage, "yeah, use those resources to get in front of the professor, they're going to help you."

Sol Rosenbaum:

Absolutely. And I think also one of the things that is not directly involved with helping you is that if you go to the professor and you show them that you actually care, that you're really trying, if there's a question of giving you the benefit of the doubt between two grades, they're going to give you the benefit of the doubt because they see you're somebody who cares and you always want to have that little push. It's funny you mentioned YouTube. There actually are



some really good resources on YouTube to find professors that explain things in a different manner than your professor explained. So sometimes if you combine what you do with YouTube, with what your professor taught, it can be beneficial. But I wouldn't use that as a way to get out of going to your professor's office hours and working on that connection.

Michelle McAnaney:

Is this part of what you do as The Engineering Mentor, when you're working with students in college, is help them understand that they're not just networking and learning these skills for their future career, but that it can actually help them do better in college. When you go to a professor's office hours, it's kind of a way of networking, letting them get to know you. Did you talk about that with them?

Sol Rosenbaum:

Right. Absolutely. I mean, I think what I cover is pretty much anything outside of your classes. I'm not going to help you with your homework. I'm not going to help you write your dissertation. I might say, "okay, here's some resources", this is what you should try in terms of people who have issues struggling in a class, studying, keeping up with the homework. I'll certainly give various tips and tricks and work with them and especially make them accountable to somebody so that they are pushing in that direction. But I won't actually sit there and do homework with them.

Michelle McAnaney:

I bet they'd like it if you would.

Sol Rosenbaum:

You know what? They might not because at this point, some of that stuff, I could sit there and struggle along with them, so I don't know. That would depend on the class, but certainly the truth is within all of this framework, if there are people who want to go into the energy efficiency field or the energy field, then I do help them in extra areas where I just can't help other people because I'm so familiar with this part of the field and then also the people within it.

Michelle McAnaney:

Right, of course. Sol, thank you for coming on The College Spy podcast. I really appreciate it.

Sol Rosenbaum:

My pleasure. I'm happy to help and people can contact me through my website, but also I'm fairly active on LinkedIn. If anybody wants to reach out and connect to me over there.



Michelle McAnaney:

Sounds good. Thanks so much.

Sol Rosenbaum:

My pleasure. Have a great day.

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The College Spy's Tip of the Day:

Today's tip has to do with resumes. All high school students should write a resume and update it each school year. There are two reasons I recommend having a resume. First, you will need to list your activities in the activities section of the common application, and having your activities organized in one place, such as a resume, will make this job easier. Second, writing a resume is an active reflection. As students write their resumes, they often realize that they have impressive skills and experiences that should be showcased in their college applications.

Today's college spotlight is on Rose-Hulman Institute of Technology.

Rose-Hulman is located in Terre Haute, Indiana, a few hours' drive from Cincinnati, Chicago, and Indianapolis. Rose-Hulman is a small STEM school with a friendly and collaborative student body. The grad school is very small, so the focus is on undergrads and students have lots of opportunities to do research. Classes are small and professors are accessible. Rose is on a quarter system, which means classes are fast paced. There are more boys than girls at Rose-Hulman. It doesn't have the "Rah Rah" school spirit of rival Purdue, but it is a friendly place with traditions, Greek life, and passionate students.

Interesting majors not found at all other Polytechnic institutes: optical engineering, international computer science, computational science, and engineering physics.

Famous alumni from Rose-Hulman: Tim Cindric, Don Lincoln, Marshall Goldsmith and Abe Silverstein.

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