Dr. Jacqueline Mozrall, department head and associate professor of industrial & systems engineering, Kate Gleason College of Engineering, Rochester Institute of Technology (RIT), became interested in engineering while still in high school. Since she enjoyed math, science, and problem-solving—and was adept in all these areas—engineering was just one of many career options available to her. 

“I don’t think when you’re 17 or 18 you really know what you want to be,” admits Mozrall. “There’s a small percentage of the population who knows when they’re five-years-old what they want as a career,” she concedes, “but the other 95% of us muddle through and waver back and forth between lots of things. I even thought about being a lawyer.” In the end, Mozrall chose engineering because it’s a good field with many job opportunities.

As an undergraduate at RIT, Mozrall participated in the school’s required co-op program. “One of the good things about the co-op program is that you gain experience,” she says, “but it also allows for career exploration and advisement. When working in industry, even as a student, you get exposed to things you like and things you don’t like.” As an undergraduate in industrial engineering, I found I was interested in ergonomics. RIT is a five-year program and sometime between my junior and senior year I thought I’d like to go to graduate school and potentially teach,” she notes. “I’ve always enjoyed talking and working with people and I thought a teaching career would be interesting.” Mozrall eventually earned a master’s of science degree in industrial engineering from North Carolina State University and a doctoral degree in industrial engineering from the State University of New York at Buffalo.

For those contemplating a career in the academic arena, at least at the college level, an advanced degree is desirable. “It’s best to have a PhD,” says Mozrall, “even though some schools will hire people who only have master’s degrees. But in general, teaching engineering at the college level requires a PhD at most schools. I enjoyed graduate school and decided I wanted to stay in academia. I like the flexibility and the ability to interact and work with college students. It’s a great environment.” After graduation, Mozrall was hired as an assistant professor where she primarily taught industrial engineering courses and laboratories related to human factors/ergonomics, engineering design, and statistics. After only five years, she was named the department head in industrial & systems engineering at RIT where she oversees and manages department operations. Her dual role has many rewards and challenges. “As a professor,” states Mozrall, “the challenge is to always stay on top of the technology.”

Mozrall continuously learns about new technologies and what her students might see or do while they’re part of the workforce. “When they come back from co-op and take classes again, I don’t present them with the most up-to-date material, they’re going to know it,” she states. “We as a department have to ensure that we continually adapt our curriculum and that we teach state-of-the-art, contemporary topics and current issues and move forward.”

Made By Women, For Women
Mozrall believes engineering is a great career choice for women because it’s all about solutions. “Women are good at solving problems,” she states, and having a woman’s perspective on design—from lotions and kitchen products to automobiles and computers—many of which are aimed at today’s women, makes perfect sense. Mozrall notes, “A lot of these products are going to be used by women, so to have women fully integrated into
helping design, distribute, and deliver these products to the marketplace is a good thing.

“This country needs more engineers,” continues Mozrall. Yet, many qualified women still shy away from this exciting and lucrative field. “There are lots of theories as to why women steer clear of engineering. Some people say it’s a critical mass theory—that there aren’t a lot of women in the field, therefore other women don’t want to go into it,” states Mozrall.

To help change this way of thinking, RIT developed its women in engineering program to both promote and attract more women to the field. “I’m involved in that program, which has a portfolio of outreach programs that are aimed at

of the car, whereas industrial engineers are concerned “For instance,” she explains, “when designing a car, more women to the field. “I'm involved in that program, women also like to be in fields where they help people, and so it seems to me engineering is a natural. There are a lot of opportunities to help people in engineering.” As for Mozrall, she plans to continue helping women discover and take on the challenges of industrial and systems engineering. “I enjoy working in an academic environment,” she concludes, “and I enjoy the continuing opportunities to learn and work with students.”

A Fan Of Math And Science

Ann Yates, a senior marketing engineer for Rockwell Automation, manages specific product offerings for its customers. Yates’ primary job purpose is to ensure cost-effective and globally competitive products. Her specific responsibilities include competitive evaluation, product positioning, product identification, forecasting, pricing, product development coordination, and market introduction of new products. The result of these activities allow for the company to sell the correct products to the field, while offering daily support to ensure the company is providing fine and accurately engineered products to its customers.

Rockwell Automation manufactures industrial controls that include everything from pushbuttons to logic controllers to software—everything needed for completely integrating automation systems for a wide variety of customers ranging from those in the automotive industry to those in the entertainment field.

Like most engineers, Yates was a fan of both math and science while in school. “I decided to study engineering first,” she says, “because it would be easy to fall back into math if I wanted to later. I ended up liking applied science, which is essentially what engineering is. I chose mechanical engineering because I liked the hands-on, true application,” she explains. Ann Yates’ area of expertise revolves around terminal blocks, which is a product that creates a central termination point for field wiring. A terminal block groups and distributes inputs and outputs by function, and provides an easy, convenient method to group wiring together. Her product line consists of more than 1,000 variations of products and accessories.

Yates has a four-year mechanical engineering degree from Purdue University and a master’s of business administration (MBA) degree from Marquette University. She toiled in the real world for five years before going back to school to earn her MBA. “It worked out well for me. I was able to get much more out of the MBA program by waiting several years because I had the real-life experience and was able to understand the material better.” Another bonus of delaying her return to school was that Rockwell Automation paid for her studies.

“Ultimately, our customers come to us for the final word on how they should use our product for their particular application,” she explains. Yates’ area of expertise revolves around terminal blocks, which is a product that creates a central termination point for field wiring. A terminal block groups and distributes inputs and outputs by function, and provides an easy, convenient method to group wiring together. Her product line consists of more than 1,000 variations of products and accessories.

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The workload was not as difficult as engineering undergraduate school,” admits Yates. “And it was definitely a different mindset, especially after being out of the rigorous college life for a few years. But it was still a challenge going to classes while working.” Yates’ classmates in the school of mechanical engineering were predominantly men, only about 30% were women. “Engineering is usually not a top choice for women and I think that’s because a lot of women don’t know it can be an option for them. I think many girls feel a little intimidated by the field.” Yates believes the tide will turn with additional encouragement and education. “Many people are ignorant about what engineering is all about. In fact, here in the inner city of Milwaukee, WI, some kids think engineering deals with maintenance because the school system calls its janitors ‘engineers.’ Some people just don’t understand what engineering entails, so they limit what an engineer is and does.”

Yates sees a slow but steady change now that many schools such as Purdue offer outreach programs to better explain to high-school girls what engineering is all about, and that they should not have limited expectations of themselves. “Engineering has so many options with many different types of fields,” she notes. As for Yates’ future, she has her sights set on a higher-level project and business management position. She’d like to focus more on the bigger picture as opposed to one product category. Yates works toward this goal by getting more experience in the marketing field, which allows her a better business viewpoint of how the company works internally with the external business world.

An Encouraging Role Model

Unlike many women who are good in math and science, Melissa Price was actually encouraged to be an engineer. “My teachers were always encouraging,” says Price, “but the person who pushed me the most was my mother, who is actually not in engineering. She’s always recognized my strength and interest and supported me.”

One catalyst for Price’s interest in engineering was her fascination with earthquakes and how buildings were designed to withstand them. “I thought I could build the perfect earthquake-proof city,” she states. “I just knew I could do that.” And that was her goal when she first made the decision to become a civil engineer. At the University of Southern California (USC), Price studied building design and enrolled in civil structural courses and architecture studios to learn modeling and application. After sitting through numerous classes studying beam deflection, Price knew she needed something more people oriented. “I just couldn’t handle how dry and boring it was,” she admits.

Price had more than a few discouraging experiences, including professors who, even in this day and age, did not take the women in their classes seriously. “I was ready to leave engineering entirely,” continues Price. She met with Louise Yates, associate dean of engineering, student affairs at USC, who directed her toward Dr. Maged Dessouky in the industrial and systems engineering (ISE) department. “Dr. Dessouky is an outstanding professor who sold me on industrial engineering—it was a broad curriculum with entertaining classes. ISE wasn’t pointed in one general direction, so it was something I could dig into. I’m interested in all general directions, so it was something I could dig into.”
BY LANA RUSSO

WOMAN ENGINEER ON THE RISE: Cindy Allen Of Texas Instruments

I graduated from Texas Tech University in Lubbock, TX, with a bachelor’s degree in chemistry. My first job after graduation was as a process engineer in a Texas Instruments’s semiconductor wafer fabrication (fab) plant. After five years, I left the company to stay at home with my three children for several years. I then worked a short stint at Fairchild Semiconductor, returned to TI in Lubbock, and eventually transferred to Dallas. I have worked at TI for over 20 years and have held many positions in various departments including process, equipment, and manufacturing engineering.

WE: Can you describe your background?

CA: I graduated from Texas Tech University in Lubbock, TX, with a bachelor’s degree in chemistry. My first job after graduation was as a process engineer in a Texas Instruments’s semiconductor wafer fabrication (fab) plant. After five years, I left the company to stay at home with my three children for several years. I then worked a short stint at Fairchild Semiconductor, returned to TI in Lubbock, and eventually transferred to Dallas. I have worked at TI for over 20 years and have held many positions in various departments including process, equipment, and manufacturing engineering.

WE: What do you enjoy about your current position at TI?

CA: I am a factory manager for one of the largest wafer fabs at TI. My responsibilities include managing all operational aspects of a facility that produces almost one million wafers a day. These wafers are used in a variety of applications including automotive, wireless, computing, military, and consumer products.

WE: Why do you enjoy work at TI?

CA: The semiconductor industry is a fast-paced, highly technical and ever-changing environment. TI is one of the premier semiconductor companies and our success to date can be contributed to strategic direction, having the right technology, customer support, and execution. I believe in the company’s direction and am excited to be a part of this winning team.

WE: Express your opinion about the industrial engineering, field and its future. Do you see a lot of job potential?

CA: Industrial engineering can be limited to or include many disciplines. Industrial engineers in the manufacturing sector are responsible for design factory layouts, model equipment, manage development labor-staffing models, and create cost models that enhance productivity. On more general terms, industrial engineering can be defined as engineering positions that include chemical, electrical, and civil engineering. These engineering disciplines will be the key enablers to promote increased productivity, profitability, and innovation as we compete globally.

WE: What advice do you have for others pursuing this degree?

CA: Industrial engineering is a tough academic field, so proficiency in math and science is a fundamental requirement. My advice for those beginning their education is to study hard, learn the technical materials, and earn the grades. Second, pursue internships and co-op opportunities. Third, enroll in courses that improve the soft skills such as presentations, communications, and organizational behavior. Networking and understanding what the top companies are in the chosen field is essential to land the premium jobs. In addition, consider a graduate degree. In some cases, a master’s degree or PhD is valued in the highly technical jobs.

WE: What types of skills do you feel are necessary to be a part of Texas Instruments?

CA: I believe the most important skill at TI is to be good at what you do. College choice, earning excellent grades, completing internships, and writing for publications are critical to build résumés for entry-level positions. For experienced workers, it is necessary to be a part of the winning team.

WE: Where do you see yourself in the coming years?

CA: My current career roadmap is to stay in the manufacturing sector and utilize my core competencies to add as much value as possible. However, I do look forward to becoming a grandmother someday and having more time to stop and smell the roses.

California Institute of Technology (Caltech) Incorporated, based in Dallas, TX, is a world leader in digital signal processing and analog technologies. The company has won numerous awards for its commitment to diversity, healthy lifestyles, and advancement. For its efforts to reward and recognize people, TI regularly appears on Fortune magazine’s “100 Best Companies To Work For” list. Woman Engineer magazine recently had the opportunity to chat with Cindy Allen of TI, to learn what she enjoys about work at TI and to discover her thoughts on engineering as a career.

WE: What do you do in your current position at TI?

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