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Job Market
OPPORTUNITIES FOR EE GRADS

The job outlook is good for electrical engineers

More positions are open and starting salaries are rising

*By Jon Boroshok
Contributing Editor*

After several years of downsizings, closings and jobs being shipped offshore, current and soon-to-be electrical engineering graduates have reason to look forward to entering the working world. They may even find jobs waiting for them. According to the Job Outlook 2005 Fall Preview, published by the National Association of Colleges and Employers (NACE, www.naceweb.org) employers say they plan to hire 13.1 percent more college graduates from the class of 2004 than they hired from the class of



At Energizer, electrical engineer Tara Kohmetscher installs battery manufacturing equipment.



Jessica Bowles-Martinez enjoys her varied responsibilities at JHU's Applied Physics Lab.



2003.



The news might be particularly good for electrical engineering graduates. The NACE Job Outlook report, based on data gathered during the summer of 2004, lists electrical engineering among the majors expected to be most in demand from the class of 2005.

NACE has been tracking the expected demand for specific degrees for the past four years. Electrical engineering, sixth on the list in 2001, rose to the top five in 2002, 2003 and 2004.

NACE research director Camille Luckenbaugh says that the association's Summer 2004 Salary Survey report found that the top jobs for electrical engineering graduates were in project engineering; hardware design and development; design/construction engineering; systems/programming engineering and power systems engineering.

How much can a new electrical engineering graduate expect to make? Dr Benjamin Flores, professor and chair of the electrical and computer engineering department at the University of Texas at El Paso, tells students that "for every year of college, expect a salary of \$10,000." He also stresses that the likelihood of employment increases with education.

Luckenbaugh says the news could get even better. NACE's Summer 2004 Salary Survey indicates that starting salaries are moving upward.

Diversity/Careers spoke to ten recent electrical engineering graduates, who shared their educational, job-hunting and early employment experiences.



Maureen Loy.

Whirlpool's Maureen Loy: programming and circuit design

High energy would be a good way to describe Maureen Loy. She grew up in Grosse Pointe Farms, MI, and first got turned on to electrical engineering in high school. At the suggestion of a guidance counselor, she spent a week at a Women in Engineering camp at Michigan Technological University (Houghton, MI), where she did programming and worked with robotics. Inspired by the experience, she majored in electrical engineering at the University of Michigan (Ann Arbor, MI), earning her BSEE in 2004.

In college, Loy was active in the Society of Women Engineers, and was an officer in Eta Kappa Nu, an electrical and computer engineering honor society. She was awarded a University of Michigan Engineering Scholarship of Honor for all four years of study, as well as the Robert C. Byrd Honors Scholarship from the state of Michigan and a one-year scholarship from the Society of Professional Engineers.



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Loy got practical experience during college to bring to her job hunt. She completed a summer internship doing research at the university's wireless integrated microsystems lab, and did a co-op at IBM in Austin, TX as well. During the IBM co-op, Loy learned of an opening at Whirlpool through Michigan's career website. Her first interview was on the telephone.



Loy participates in Whirlpool's Technical Excellence program. The program includes a six-week orientation to the company, followed by two six-month rotations. She'll return to Michigan for a one-year masters program paid for by Whirlpool, followed by two more six-month rotations.

Currently on her first rotation, Loy is part of Whirlpool's advanced electronics applications group in Benton Harbor, MI, where she's doing C programming and circuit design for new refrigeration products. She says the transition from school to work was easy, thanks to the six-week Whirlpool orientation. "We got to see a lot of different sides of the business, not just engineering," says Loy. And it gave her time to adapt. "Not many other companies give you that opportunity while you're just starting," she says.

Loy is still involved with the Society of Women Engineers and planned to attend the society's annual conference in October to recruit for Whirlpool.

Sally Simmons: back home with FirstEnergy

Sometimes you can go home again. Hartville, OH native Sally Simmons is an assistant engineer in the substation design department of FirstEnergy Corp (Akron, OH). Her department is part of FirstEnergy's energy delivery technical services group. Simmons ensures the reliability of substations that serve residents and businesses in and around her hometown. She was also a project manager for FirstEnergy's "summer readiness" program, which was designed to boost service reliability during the peak summer season and beyond.



Sally Simmons.

Simmons' father, a mechanical engineer, encouraged her to go into engineering because of the many career options the field offered. After attending a summer engineering camp at Purdue University (West Lafayette, IN), she enrolled in the engineering program at Grove City (PA) College. She received her BSEE in 2003, the only female graduate out of twenty students. She was a member of the Society of Women Engineers, and is still an active member of the Institute for Electrical Engineers.

In school, she did an internship at Altman Hospital in Canton, OH, working with women engineers in several different engineering disciplines. "It was a great internship, a great place to work and very family-oriented," she says.

When FirstEnergy came recruiting on campus, Simmons jumped

at the opportunity, calling it a great way to "stay at home, save some money, and work for a great company in a stable area."

Simmons likes the variety of her job. She notes that FirstEnergy, with an aging workforce, is grooming its future leaders by offering them exposure to many aspects of the company. When Simmons expressed an interest in pursuing her MBA, her supervisors were receptive and supportive and gave her a taste of the financial side of the business by letting her work on her area's budget.



Yamaris Soto Collazo.

Yamaris Soto Collazo: Northrop Grumman's PDP

Born and raised in Puerto Rico, Yamaris Soto Collazo has worked as an electrical designer/test engineer for Northrop Grumman since 2002. She's currently in her third rotation as a participant in Northrop Grumman's Professional Development Program (PDP) for college graduates.

Right now, she's working for the company's power electronics-analog business in Baltimore, MD. There she has contributed to the design of a signal and voltage distribution board for a transmitter, and developed code for automated testing and power supplies testing.

Soto Collazo is excited about the products she helps build, the mentorship and professional development opportunities of her job, and the people she works with.

"My love of science and mathematical aptitude got me interested in engineering, plus I also had a mentor who is an engineer," says Soto Collazo. She earned a BSIE in 1999 and an MSEE in 2002 from the University of Puerto Rico-Mayagüez Campus College of Engineering (Mayagüez, PR). "I got interested in electrical engineering through a research project. I also did volunteer work in antenna and microwave engineering and I really loved it."

Soto Collazo completed internships at General Electric in Puerto Rico, Raytheon in Massachusetts, and Siemens, also in Puerto Rico. At Siemens, she worked as a commissioning engineer. At GE, she worked mostly on the manufacturing floor, and built her communication skills and her ability to work as part of a team in a fast-paced environment.

A career fair at school introduced Soto Collazo to Northrop Grumman. She was invited to interview and received an offer to become part of Northrop Grumman's PDP. The PDP typically involves four assignments of several months each. Soto Collazo's first rotation was in RF aperture systems, and her second was in systems supportability engineering. Once she finishes her current rotation in power electronics she'll take a permanent job with systems supportability engineering.

"I've chosen to work in systems supportability, because that group gives me work opportunities from the component to the systems level," she says.

Soto Collazo opted for a career in technology because it is "a field where you are always challenged and provides rewarding career opportunities." Eventually, she plans to go on to a PhD in engineering.

Damon Walker: intern and co-op at DuPont

Damon Walker is a process engineer in the DuPont Field Engineering program. Field Engineering participants spend several years in the rotation program, getting a broad view of what they might do at the company. Walker is currently on a two- to three-year assignment in Santa Barbara, CA, where he is working on organic light emitting polymers for displays.



Damon Walker.

"The polymers light up like LCDs (liquid crystal displays)," says Walker. "Hopefully, they'll make cheaper flat panel screens for cell phones or video monitors."

Walker speaks about his job with the same excitement he had at the age of six, when he proclaimed to his mother that he wanted to become an EE. The Salem, NJ native got his BSEE from Morgan State University (Baltimore, MD) in 2001. He received an academic scholarship for tuition and fees as an undergrad.

Although Walker did several undergraduate co-ops and internships for DuPont (Wilmington, DE), and received a job offer from the company upon graduation from Morgan State, he initially declined the offer to take a job at a tech startup. When he was laid off before his first day of work, he decided to go back to school for his MSEE. It was too late for the fall semester, so he took another internship with DuPont. He won a fellowship from the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc (GEM), with DuPont as his corporate sponsor, and got his MSEE from Michigan State University (East Lansing, MI) in 2003. This time he accepted DuPont's job offer.

Walker was the first in his family to get a college degree. He says he may someday pursue a PhD in computer engineering and ultimately wants to get into circuit design.

Walker has found some challenges making the transition from student to full-time employee. "In college, everyone is in the same boat age-wise and financially," he says. "While education helps prepare students for their job duties, it can't fully prepare them for the diversity of the workforce."

Jessica Bowles-Martinez does space work at JHU Applied Physics Lab

In her role as an electrical engineer for the Johns Hopkins

University Applied Physics Lab (Laurel, MD), Jessica Bowles-Martinez is currently working on hardware to test electronics for NASA and space exploration. She's helping to ensure that hardware and lower-level chips can work on Mars and in all temperature ranges.

She truly enjoys her job. "My work varies a lot," says Bowles-Martinez. "It's fun."

As an undergraduate student in the class of 2003 at the Massachusetts Institute of Technology (MIT, Cambridge, MA), Bowles-Martinez took so many humanities courses that she found she had enough credits for a second degree. She earned a bachelors in both electrical engineering/computer science and comparative media studies. Bowles-Martinez says her family believes strongly in the value of education.

While at MIT, she was active in both the Society of Hispanic Professional Engineers (SHPE) and Mexican American Engineers and Scientists (MAES). She completed summer internships in EE jobs at Hewlett-Packard, Intel, and Ball Aerospace. She received a scholarship from Intel during her sophomore year that covered the remainder of her undergraduate education as well as a fifth year, enabling her to dispense with loans and take enough courses to earn the two degrees.

"I'm still getting a feel for what I want to do," she says. While working full time, she is also pursuing her MSEE through the part-time program at Johns Hopkins University (Baltimore, MD).



Kelia Nichols.

Kelia Nichols: EE in astrodynamics at the Naval Research Lab

Kelia Nichols actually started preparing for her career before she graduated from seventh grade - she just didn't know it at the time. Back then, when her father decided to return to school for his electrical engineering degree, he took Nichols along with him because baby sitters were expensive. While he went to class, Nichols played on a Macintosh.

Those times shaped her interest in computerized special effects. In high school in Woodbridge, VA, she took vocational electronics classes. Then she attended nearby George Mason University (Fairfax, VA) and earned her BSEE in 2004.

Her father, now an aerospace engineer for the Naval Research Laboratory (Washington, DC), suggested Nichols look into a summer co-op or internship there. She landed a slot in the lab's Student Career Experience program. Under that program, she worked for the lab during summers and school breaks. And the lab paid for her tuition and books, in exchange for her agreement to work there after graduation. "I didn't have to go through the stress of a job hunt," Nichols says.

Nichols' work as an EE for the Naval Research Laboratory doesn't seem far removed from her early experiences. She's the only EE in the astrodynamics group, which computes satellite orbits. Nichols tests GPS receivers for upcoming launches; the receivers' technology senses, analyzes and controls aircraft heading, pitch and roll. She also tests the data processing schemes for new experiments.

"I'm on a learning curve. EEs don't usually do a lot of work with GPS," says Nichols. She wants to get her masters and hopes to take advantage of the lab's Edison program, which covers tuition and allows an employee to take two days a week off for school and still receive full-time pay. The program is named for Thomas Alva Edison, whose initial suggestions for a civilian weapons research facility led to the formation of the lab.

Kate Leach of BAE Systems: learning daily

Kate Leach is proof that good exposure to the working world at an impressionable age, along with a positive early educational opportunity, can lead to a promising career.



Kate Leach.

When representatives from BAE Systems' Women in Technology organization came to Leach's high school in Merrimack, NH, she quickly got involved. "The program helped me see a reason for math," she says.

She was part of her high school's FIRST Robotics competition team, working one on one with real engineers from BAE Systems' Nashua, NH site. She received a one-year college scholarship for engineering from her high school, and decided to major in EE. She earned her BSEE from Worcester Polytechnic Institute in 2003.

In high school, Leach had visited BAE Systems in Nashua. She interned there during college, and when the internship ended, BAE Systems offered her a job as an EE in research and development. Today, Leach designs and tests circuit boards.

Leach now serves as a mentor for Women in Technology and for FIRST. She proudly points out that her old high school robotics team is still sponsored by BAE Systems.

Leach is considering the masters program at the University of Massachusetts (Amherst, MA), and continues to love her job. "The people I work with are really awesome," she says. "I'm doing stuff I didn't learn in college. Every day I come home with something new."

Energizer's Tara Kohmetscher helps manufacture batteries

Nebraska native Tara Kohmetscher is an electrical engineer for Energizer's plant engineering group (Asheboro, NC). The plant makes the alkaline batteries used in flashlights, personal stereos and other consumer devices.

Her job involves new equipment installation for battery manufacturing. Kohmetscher provides plant power and machine controls, upgrades older machinery, supports daily production efforts, and troubleshoots electrical controls.

Kohmetscher received her BSEE in 2002 from the University of Nebraska (Lincoln, NE). Among the first generation in her family to go to college, she was awarded a scholarship from the AFL-CIO, the union to which her father belongs. When Energizer recruited on campus, she submitted her resume through her school's career services office and landed a job.

Although she didn't do any internships or co-ops, she recommends that students get some sort of experience to help smooth the transition to the working world. "I was inexperienced and didn't know what to expect. It was very different from school," Kohmetscher advises.



Ami Shah.

John Deere's Ami Shah: improving product development

Originally from Surat in the state of Gujarat in the northwest part of India, Ami Shah comes from a long line of engineers, but is the first woman in her family to go to engineering college. When she graduated from Sarvajanik College of Engineering and Technology (Surat, India) with a BSEE in 2001, it was a very proud moment for her parents.

She went right on to graduate school, earning her masters of science in electrical and computer engineering from Purdue University's Calumet, IN campus in 2004.

Although she did not do internships, Shah gained experience as vice president of the Purdue chapter of the Society of Women Engineers, and as a teaching assistant for C and C++ classes. She's now an embedded software engineer at the John Deere Product Engineering Center (Waterloo, IA) of Deere & Co (Moline, IL). She found her job through a Society of Women Engineers job fair at Purdue.

Shah writes code and is helping to develop AutoTrac software to improve automation, efficiency, safety and fault detection in product development. Most of her work is for Deere's steering control group.

Deere makes equipment for farm, industrial and home use. Its green and yellow tractors are a familiar sight in rural and suburban areas.

Shah says that while the problem solving and code writing she does are like what she did in the classroom, she feels that an internship or co-op would have helped her with both her confidence level and the transition from school to work. Shah is very happy with the way her own career is progressing, but she advises students to apply for internships to find out more about what they want to do.

Lorinda Wilson of Nissan learns from co-workers

Lorinda Wilson is a project engineer for Nissan's Technical Center-North America (Farmington, MI). She earned her BSEE from Tuskegee University (Tuskegee, AL) in 2004. At Tuskegee, she won the University Presidential scholarship and state grants, adding them to an award from the Detroit Urban League during high school.



Lorinda Wilson.

Wilson grew up in Detroit and inherited her interest in technology from her father, who was an electronics enthusiast and worked as an engineering recruiter for several major companies. She likes working with computers, and Tuskegee's program combines computers and electronics.

It's no surprise to see someone from Detroit working in the auto industry, and even less surprising that her college internships were for automotive companies like Ford and Visteon, the automotive electronics supplier. After gaining valuable automotive experience, she was recruited on campus by Nissan, and was then invited to meet with the company in Michigan. She now works in intelligent transportation systems, developing bezel switches for the displays in Nissan vehicle dashboards.

Wilson's transition from college to the professional world was easy because of the preparation she got at Tuskegee. Her curriculum provided many real-world projects. "Tech and leadership training gives Tuskegee students an edge," she says.

Nissan's buddy system and six-month cultural indoctrination program were also helpful. She finds great support within her group, and says her co-workers are "very knowledgeable and cooperative. They're always there."

Wilson hopes to stay at Nissan and move into management. She is looking into MBA programs that she can combine with her job. As a former member of the Tuskegee Student Government Association and president of the Michigan Club at Tuskegee, Wilson would like to get involved in civic organizations like the Urban League and NAACP.

All these new EEs are building on their experiences to create successful careers. They recommend job experience during college, and encourage students to stick with engineering, however hard it seems.

FirstEnergy's Sally Simmons says, "Getting through engineering school is not the easiest thing in the world. The determination that engineering majors develop will follow them throughout their careers."

D/C

Jon Boroshok is a freelance writer in Groton, MA.

OPPORTUNITIES FOR EE GRADS

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<p>AREVA/Framatome ANP (Bethesda, MD) www.areva.com</p>	Nuclear power generation, electricity transmission and distribution
<p>BAE Systems North America (Rockville, MD) www.na.baesystems.com</p>	Aerospace and defense engineering, intelligent electronic systems, information technology and technical services
<p>Dell Inc (Round Rock, TX) dellapp.us.dell.com/careers/</p>	Computer hardware
<p>DuPont (Wilmington, DE) www.dupont.com</p>	Products for agriculture, nutrition, electronics, communications, safety and protection, home and construction, transportation and apparel
<p>Eveready Energizer Battery Inc. (Westlake, OH) www.energizer.com</p>	Battery and lighting products
<p>Federal Aviation Administration (Washington, DC) jobs.faa.gov</p>	Operates the U.S. aviation system and regulates commercial space transportation
<p>FirstEnergy Corp (Akron, OH) www.firstenergycorp.com/employment</p>	Public utility holding company
<p>Ford Motor Company (Dearborn, MI) www.mycareer.ford.com</p>	Automotive products and services
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<p>Micron Technology, Inc (Boise, ID) www.micron.com/jobs</p>	Semiconductors
<p>MIT Lincoln Laboratory (Lexington, MA) www.ll.mit.edu/careers/careers.html</p>	Federally funded research and development center of the Massachusetts Institute of Technology
<p>NAVAIR (Patuxent River, MD) jobs.navair.navy.mil</p>	Cost-effective readiness and maritime combat technology for the U.S. Navy and Marine Corps
<p>Naval Research Laboratory (Washington, DC) hroffice.nrl.navy.mil/jobs/index.htm</p>	Navy's corporate laboratory for R&D
<p>Nissan Technical Center North America (Farmington Hills, MI) www.nissanusa.com</p>	Automotive R&D
<p>Northrop Grumman Corporation (Los Angeles, CA) careers.northropgrumman.com</p>	Defense
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