

EngineeringNews



A MESSAGE FROM OUR DEAN

Lately we've seen more global outsourcing of engineering positions. The U.S. graduated approximately 70,000 engineering students with bachelor's degrees last year. Japan graduated about 110,000, and China graduated 220,000. Salary-wise, U.S. engineers average \$70,000 compared to \$15,100 in China. It's not surprising to hear that instead of "qualified people seeking work wherever work is available, work is seeking qualified people wherever they are."

Our strength remains in the qualified people we educate. We recognize that innovation made the U.S. great, and we still are the best at fostering creativity and innovation. These are strengths where the U.S. can continue to dominate.

We see such creativity and innovation right here at Rowan. Our students experience real-world challenges through our clinic environment, which promotes innovation and entrepreneurship. We meet work force outsourcing challenges by providing valued graduates who quickly contribute to their employers, country and world, which you'll read more about in this newsletter.

Regards,
Dianne Dorland
Dean of Engineering

Prof, Students "Re-Up" with U.S. Air Force Work to Clean Contaminated Land in Three States

Civil and environmental engineering professor Dr. Jess Everett has re-upped with the United States Air Force to develop methods to clean contaminated land more quickly and with fewer hazards than is presently done. Everett and his student clinic team are undertaking site remediation at Dover Air Force Base in Delaware, Goodfellow Air Force Base in Texas and Altus Air Force Base in Oklahoma.

The Air Force Center for Environmental Excellence (AFCEE) funded Everett's two Dover projects, awarding him a \$150,000 research grant in 2003 and \$60,000 in 2004. The team is completing one Dover project, which involves injecting the chemicals sodium lactate and magnesium sulfate in the ground to destroy the contaminant trichloroethene (TCE) – a chlorinated solvent used for cleaning and a suspected carcinogen. Naturally-present bacteria consume the lactate and sulfate, resulting in the formation of iron sulfide, which destroys TCE on contact.

The Rowan team is working on the second Dover project with Parsons Engineering and Earth Science Services under a \$250,000 grant from AFCEE. Team members will back-

fill a 500- by 25-foot trench with a mix of mulch, sand and limestone. Half of the trench also will contain gypsum, a source of sulfate. The half with sulfate will destroy TCE by generating iron sulfide, the process developed by Everett and his colleagues. The half without sulfate will destroy TCE by an established technology called biostimulation. Through testing and analysis of the two TCE-destroying technologies, the Rowan students will help determine which works best. The team is conducting similar work at Goodfellow and Altus, working with Oklahoma-based Earth Science Services.

"This work is important because site cleanups can be very expensive, and we are always looking for better ways to facilitate them. This technology appears to work more quickly than the current technologies that are used and may be more effective. It also may have safer byproducts," Everett said.

He noted the work also is important for the Rowan team. "Our students get to participate in real-world projects and work on remediation by doing, not just by reading books," he said.



Dr. Jess Everett and students discuss samples tested for the Rowan project related to U.S. Air Force site cleanup in Delaware, Texas and Oklahoma.

Rowan Programs Contributed to Jeffries' Rise at Lockheed Martin

Catherine Jeffries (ME '00) credits her Rowan engineering education with introducing her to defense and civil government contractor Lockheed Martin and honing the skills she now uses professionally. "For Rowan clinic projects, I was the program manager, gathering the troops, managing the schedules and budgets and preparing out-briefs. This activity prepared me for the world of management," said Jeffries, who now is manager of supply chain services for the Moorestown operation, matching technical subcontractors with Lockheed's needs across the corporation.



Catherine Jeffries

Lockheed interviewed Jeffries at a Rowan recruiting event. An ensuing series of interviews led to an opportunity in the Operations Leadership Development Program, a master's in engineering management from Drexel, and her current position.

On any given day, Jeffries may make marketing calls to provide services to other areas of the corporation, meet with finance personnel to review and approve budgets, fine-tune contracts that represent some of the more than 300 subcontracted technical people she manages, or mentor the 10 people she directly manages, to name just a few of her responsibilities.

Jeffries credits her achievements in her professional life to what she learned at Rowan. "At Rowan we worked on real issues with real problem-solving," she said. And at Rowan, she learned to ask the right questions and to focus on the process as well as the end results, skills she uses every day.

Nobel Winner Draws Crowd to Henry M. Rowan Speakers Series

With a nod to Rowan Engineering's hands-on education, which he said was "right up his alley," Nobel Prize winner Dr. Horst Stormer spoke to a packed house about nanoscience and technology at the latest session of the Henry M. Rowan Speakers Series in October.

“It's important for everything around us. The microscopic property of things is decided on the nanoscale. The one who can manipulate the nanoscale can manipulate anything.”

More than 140 students, staff, faculty, members of the Dean's Advisory Council and friends crowded the Betty Long Rowan Lecture Hall and spilled over into a nearby classroom to hear Stormer's presentation, "Small Wonders: The World of Nano Science."

"This (subject) will probably be the basis for the most important technology we ever develop," said Stormer, who shared the 1998 Nobel Prize in physics for his discovery of a new form of quantum fluid with fractionally charged excitations known as the fractional quantum Hall effect.

Now a professor of physics and applied physics at Columbia University and a physicist at Bell Labs, Stormer used visual aids that included a basketball to illustrate the nanoscale, or items one-billionth of a measurement. "It's the biggest Lego set of the universe to build something," he said of nanolife. "It's important for everything around us. The microscopic property of things is decided on the nanoscale. The one who can manipulate the nanoscale can manipulate anything."



In October, Nobel prize winner Dr. Horst Stormer gave a lively lecture to a packed house in Rowan Hall.

Stormer was the eighth speaker in the Henry M. Rowan Speakers Series, which the Dean's Advisory Council started in early 2002 for the College of Engineering. The series brings top professionals in their fields to campus to discuss relevant topics of interest to students, engineers and the general public.

"Dr. Stormer addressed a critical topic that interests students and professors, providing insight on a subject that will impact their careers and their world," said Dr. Dianne Dorland, dean of the College of Engineering.

The recent Tech Expo provided the opportunity for engineering and computer science majors to interview for internships and jobs.



Tech Expo, Outreach Activities Assist Students

The attire was suits and shoes, not everyday student garb. The conversation focused on talents and skills, not on tomorrow's test or next week's lab. The place was Rowan's Student Center, and the event was the fall Tech Expo, which brought together representatives from the U.S. Navy, Inductotherm, the New Jersey Department of Transportation and Sunoco, among others, for interviews with more than 60 engineering and computer science majors.

The Tech Expo is one of the College of Engineering Outreach Office's projects.

Melanie Basantis, outreach director, said, "We are involved in the daily operations at the College, coordinating technical events, providing tours and seminars for local counties' industrial executives and hosting middle-school-age 4-H members. We are involved with promoting engineering education and serving as the link to the business community for the College of Engineering."

The Outreach Office also coordinates the spring Technical Career Fair, where company representatives and students talk about possible jobs and internships. Basantis stressed the importance of internships today. "They're almost a must on the resume," she said.

Basantis, who informs students about campus resources to help them prepare for interviews, raises awareness of the Career Fair and the Tech Expo by talking with classes about the events and their importance. As an added bonus, the Outreach Office runs a new web site with round-the-clock access that provides students with information about job opportunities.

Other important ongoing efforts include coordinating the Fundamentals of Engineering and Professional Engineers exams given on campus, hosting the New Jersey Technology Council's Civil and Environmental Forecast Forum, supporting the Dean's Advisory Council for the Henry M. Rowan Speakers Series and co-sponsoring joint activities with partnering high schools.

Clinic Project Promotes Clean Energy for Rowan Campus

A five-member student engineering clinic team has taken the latest step towards the installation of a photo-voltaic (PV) system on the Rowan campus, which will provide a renewable source of energy for the University. The team has sought input from other campus groups and recently met with Rowan's Master Plan Committee to discuss three potential campus sites. The students are designing and procuring the PV unit, which will convert sunlight to electricity, and should site the system in the spring.

Dr. Peter Mark Jansson, associate professor of electrical and computer engineering, said Rowan is making strong progress in the right direction toward reducing campus greenhouse gases with the PV project. Additional engineering clinic topics add to this progress, highlighted by recent funding from Rowan Facilities Planning for campus energy audits.

Rowan's interest in clean energy is not new. Dr. Linda M. Head, associate professor of electrical and computer engineering, brought a PV installers course to campus in 2001 for a utility company. In June, Jansson and Head organized the



Engineering students and Dr. Peter Jansson (center) have been working to site a photo-voltaic system on the Rowan campus.

New Jersey Clean Energy Symposium, which drew about 150 attendees to Rowan to learn more about obtaining clean and renewable energy.

Through Head's efforts, Dr. Gay Canough, president of ETM Solar Works, Endicott, N.Y., taught a PV Installers Course at Rowan in September. "Dr. Canough, a scientist and a businesswoman, has the experience plus the scientific expertise on installing photovoltaics and providing pointers on the business aspects of such work," Head said.

Rowan also reaches out to the community through Jansson's participation in the New Jersey Higher Education Partnership for Sustainability (NJHEPS), for which he is serving as vice president for 2004-05. In that role, Jansson focuses on how NJHEPS can assist New Jersey colleges and universities in moving towards renewable energy sources.

"The College of Engineering has established a presence in the clean energy community," Jansson noted, "and Rowan is moving forward to set an example for energy sustainability."

Sampling the Work of Dr. Beena Sukumaran

Whether teaching classes, investigating a civil engineering topic or organizing a conference, Dr. Beena Sukumaran, an associate professor of civil and environmental engineering, makes an impact on today's world.

Through a \$55,000 Federal Aviation Administration grant and with the aid of graduate student Michael Willis ('05) and seniors Douglas Schmeelk (CEE '05) and Carolyn Hampton (ME '05), Sukumaran has been working on finite analysis modeling to further understanding of pavement behavior, particularly under the weight of today's heavier aircraft. Sukumaran said, "The finite element modeling study will enhance the understanding of pavement behavior, and the results will help develop better predictive tools for designing the airport pavements of the future."

Through \$76,200 in funding from the National Science Foundation, Sukumaran and Georgia Tech collaborators are organizing an international workshop for March 2005 in Cambridge, England. The program, "Micro-Geomechanics Across Multiple Strain Scales," will bring together researchers and practitioners from academia, government and industry to talk about their work in micro-geomechanics, treating soil materials and their properties in terms of individual particles.

Sukumaran also has been involved with an Engineer's Without Borders™ water project in Honduras.



Dr. Beena Sukumaran

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