

EngineeringNews



DEAN'S MESSAGE

At Rowan, we work to help every student become a success. We don't believe in the "sink-or-swim" approach that often results in a loss of talent as students pursue an engineering degree.

Our supportive approach enables our faculty to seek innovative clinic experiences such as the aquarium project featured in this newsletter. Our engineering clinics build on a foundational concept in engineering: we learn best when we teach others.

The clinic experience promotes a different dimension in engineering, one of discovery, design and imagination. We seek to focus on project outputs and potential career opportunities. The clinics enable students to see how engineers make a real difference in the world.

Integral team-based initiatives encourage development and success. The retention rate for Rowan engineering students is 86 percent from the freshman to sophomore year and 80 percent through graduation. This compares to 56 percent nationwide. Courses are not easier here, but the environment and experiential learning in Rowan Engineering make the difference for our students.

Regards,

Dianne Dorland
Dean of Engineering

School's in session for Rowan Engineering and K-12 students throughout South Jersey



The Adventure Aquarium is providing a window on engineering for both Rowan and K-12 students in a collaborative project that includes the College of Engineering, the New Jersey Academy of Aquatic Sciences and Cumberland County College. (See story on page 3.)

\$600,000 NSF grant will fund CoE scholarships

Thanks to a recent \$600,000 grant from the National Science Foundation's Division of Undergraduate Education, financially qualified Rowan College of Engineering students will receive a prestigious scholarship in one of the most highly ranked undergraduate programs in the nation.

The "NSF Engineering Scholarships," also known as "S-STEM: Scholarships to Enhance the High-Tech Workforce of Southern New Jersey" will fund four-year scholarships for College of Engineering cohorts entering the program in Fall 2009 and Fall 2010. The scholarships will replace loans such as the Stafford, but will not replace grants or other scholarship awards.

The grant – the largest the College has ever received for scholarships – also will supplement tutoring services, create learning communities where engineering students can interact and study together, facilitate mentoring opportunities and build outreach programs to high school seniors who have participated in past College of Engineering programs for middle and high school students, such as Attracting Women to Engineering and Rowan's Introduction for Students to Engineering.

Dr. Jess Everett, the civil and environmental engineering professor who is coordinating the scholarship program, said all students who are accepted into the College of Engineering will be considered for a scholarship.

"This grant acknowledges our nationally recognized engineering programs and will ensure that more gifted students with financial need will be able to study in those programs," said Dr. Dianne Dorland, dean of the College of Engineering.

Rowan is in the process of developing criteria for the scholarships. Information will be available in the future in the College of Engineering and Financial Aid sections of the Rowan website at www.rowan.edu.

CoE alumnus cooks up a successful business

When Rowan engineering student Michael Muhlbaier came up with the idea for a new type of light-emitting diode (LED) taillight in 2003 for an engineering clinic, he certainly didn't think it would lead him to running such a successful business as Spaghetti Engineering.

But, after creating the taillights, Muhlbaier started thinking about other possibilities for automotive products, and Spaghetti Engineering was born. He started his company during his senior year at Rowan and fully developed it while earning his master's degree in engineering at Rowan in 2004

"It was a learning experience," the 25-year-old Muhlbaier said. "There was an army of details and dilemmas to battle to start a company and keep it growing."

An LED taillight comprises multiple, smaller lights, as opposed to a traditional single incandescent taillight. Typically, those smaller lights stay lit at the same time, but Muhlbaier patterned the lights.

"The primary values of our technology are safety and style," Muhlbaier said. "Studies have shown that human reaction time is reduced when reacting to a moving signal as opposed to a stationary signal."

Muhlbaier even had his product featured on the popular MTV show "Pimp My Ride" and the Discovery Channel's "American Hotrod" in 2005.

Based in West Berlin, Spaghetti Engineering designs, develops and produces high-performance automotive products. Muhlbaier said that currently the firm's market focus is on aftermarket parts for American muscle cars and classics.

Muhlbaier said Rowan gave him the necessary tools to run a successful business. "One thing I found, which is particularly true for graduate education, is that it is not as much about what you learn as how you learn, and Rowan has taught me a great deal about how to learn," he said.

In his free time, Muhlbaier also works as a consultant and, together with a Rowan associate professor of electrical and computer engineering, Dr. Robi Polikar, he is publishing a journal paper in the IEEE publication "Transactions on Neural Networks" in December.

So what advice does Muhlbaier have for current Rowan engineering students who are interested in starting their own businesses? "I would encourage you to take advantage of the opportunities around you," he said. "Rowan has a wealth of opportunity, but it requires some initiative and hard work to realize your potential."

To learn more about Spaghetti Engineering, visit www.spaghettiengineering.com.

Michael Muhlbaier holds up a taillight and a front marker light for a 1967 Chevy Camaro. Muhlbaier began a company that makes LED taillights while he was an undergraduate engineering student at Rowan.



Project brings new energy to CoE engineering clinic

Things are literally heating up on the third floor of Rowan Hall.

That's where chemical engineering associate professor Dr. Kevin Dahm and his students are working with a Medford-based engineering company to advance a new solar thermal collector.

Dahm and his students, with the help of Neal Cramer, entrepreneur and founder of Helios Products, LLC, are testing and evaluating the materials used in the construction of a new solar thermal collector. For a small fraction of the cost, the thermal collector will capture as much energy from the sun in the form of heat as traditional photovoltaic systems produce electricity.

Without going into too many specifics, as the patent for this new technology is pending, Dahm said that during the last 30 years the engineering industry has been making improvements on the same basic design. "We think the Helios panel is a fundamentally new approach," he said.

The potential applications for this technology are widespread, including industrial, commercial, manufacturing and residential uses. In residential settings, it can be used to heat water and for space heating, goals Dahm refers to as "low-hanging fruit." But Dahm added that the new solar thermal collector could also be used to cool homes.

In August 2007, Helios approached Rowan about a partnership. Dahm had already completed extensive research on the absorption and scattering of light, and with a crew of motivated engineering students and the ingenuity of Cramer, went to work.

According to junior chemical engineering major Anthony Martorano of Burlington Township, the project has been a great experience. "The project itself is taking a new spin on an older renewable energy idea and is proving to be very competitive," he said. "Sustainability is becoming more important in the world's eye, and this project is one that has the potential to benefit society and prosper in this market."

For more information, contact Kevin Dahm at dahm@rowan.edu or Murray Luftglass of Helios at murray@mandalondon.com.



*Chemical engineering associate professor **Kevin Dahm** (kneeling left) and Helios Products, LLC, founder **Neal Cramer** read a temperature indicator for a prototype solar panel that was built by a Rowan clinic team.*

School's in session for Rowan Engineering and area K-12 students

School's in session for Rowan College of Engineering students and professors — and K-12 students as well — thanks to a new collaboration with the Adventure Aquarium, the New Jersey Academy of Aquatic Sciences (NJAAS) and Cumberland County College (CCC).

Under a \$150,000 grant from the National Science Foundation, Rowan is teaming with the other organizations to help educate K-12 students about the engineering and science behind a seemingly simple aquarium at both the Aquarium and NJAAS in Camden, and potentially in classrooms around the world via the Internet.

Dr. Kauser Jahan, chair of Civil and Environmental Engineering, is leading a team of Rowan students and faculty from all four disciplines, including Drs. Jess Everett, Stephanie Farrell, Gina Tang and Hong Zhang. They are developing instrumentation for a 100-gallon tank that will measure such things as temperature, dissolved oxygen and pH levels; outfitting a distance-learning classroom at the Aquarium/NJAAS; and developing hands-on activities, experiments, lectures and presentations that will be made available via the Internet for participants. Jahan expects to have the program running by January, after which students will be able to learn about engineering fundamentals at the aquarium or via a website tied to the location that they can access from their classrooms.

Personnel at the non-profit NJAAS, based at the Aquarium, will offer an educational outreach program that will feature engineering concepts in the study of the 100-gallon aquarium it houses in the distance-learning classroom. NJAAS will provide real-time data and visuals of the aquarium accessible through its website (www.njaas.org) under the title "NJ-Quarium," which will show a live web cam view of the aquarium, offer teachers of all grade levels access to recorded experiments NJAAS performs in the tank and provide real-time data for classroom analysis.

Vineland-based CCC, which is helping develop lessons for the program, will adopt experiments and modules for its Introduction to Engineering course in an effort to make the transition easier for students entering Rowan Engineering from the county college.

Rowan also will feature the aquarium as a component of a freshman engineering clinic that includes reverse engineering, a process in which students disassemble products to assess how they were engineered.

"An aquarium is more than an attractive habitat for fish," Jahan said. "It is an exquisite combination of interacting systems that can be analyzed using multidisciplinary engineering and scientific principles. The aquarium connects engineering with an interactive, innovative and exciting application that appeals to a wide audience."

Prof enjoys opportunities engineering provides



Dr. Shreekanth Mandayam

From image processing to inspecting rocket engine test stands, associate professor and Electrical and Computer Engineering Program Chair Dr. Shreekanth Mandayam has dedicated himself to engineering.

“As a researcher, I love the challenges and the freedom to pursue diverse interests and apply my skill-set to address problems that are completely new to me,” Mandayam said.

As one of the first faculty members of the Electrical and Computer Engineering Program at Rowan, Mandayam said he revels in the program’s success and the work he and his students have completed.

“Seeing the ECE program being successfully accredited twice and being ranked in the top 10 ECE programs in the nation has been exceptionally rewarding. I take pride in being part of a team that made it happen” he said.

Currently Mandayam is working on research for NASA Stennis Space Center in Mississippi, inspecting rocket test stands. He also is working for the United States Navy to detect leaks in ships’ pipes. Both of these projects will make use of the Cave Automatic Virtual Environment (better known as CAVE®) virtual reality system that is being installed at the South Jersey Technology Park.

Before coming to Rowan, Mandayam earned his B.S. in electronics engineering from Bangalore University in India and his M.S. and Ph.D. in electrical engineering from Iowa State University.

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Engineering students demonstrated various projects, including virtual reality work, in labs in the Samuel H. Jones Innovation Center at the South Jersey Technology Park. The building was officially opened in October.