



### DEAN'S MESSAGE

Rowan Engineering embraces the Grand Challenges identified by the National Academy of Engineering in many ways.

Our outreach programs such as CHAMP (Creating Higher Aspirations and Motivations Project) provide exciting experiences for K-12 schools, addressing the Grand Challenge of attracting students to engineering. Another Rowan project, the Rubik's Cube-Solving Robot, also has captured the attention of young minds and heightened the general public's awareness of engineering.

Because Grand Challenges addressing social needs cannot be solved by academia alone, it becomes increasingly important to partner with industry. Our Engineering Clinics, a hallmark of our program, provide a vehicle for industrial collaboration. These multidisciplinary clinics are celebrated in events such as Industry Day, where we showcase our collaborative projects.

As you read this newsletter, our motto, "Innovation Starts Here," comes to life as we implement a range of strategies in meeting the Grand Challenges.

Please contact us to learn more about exploring opportunities together.

Dr. Steven Chin  
Interim Dean

## The need for speed: Student-designed robot solves Cube in seconds

For more than three decades, the vividly colored Rubik's Cube has fascinated and frustrated puzzle lovers worldwide.

This year, Rowan University College of Engineering students added their own twist to solving the three-dimensional puzzle, creating a robot that can spin it into completion with a maximum of 20 turns in 15 seconds.

The heart of the Rubik's Cube-Solving Robot is a Siemens' programmable logic controller (PLC), a piece of equipment used in industry for such tasks as automating assembly lines.

When challenged in an engineering clinic to develop a PLC application, students Zachary Grady, a senior electrical and computer engineering (ECE) major from Audubon, and Joe Ridgeway, a senior ECE major from Norwalk, Conn., considered a few options before exploring the PLC's puzzle-solving potential.

"I thought that solving the cube was something we could do with this project," said Ridgeway, a long-time Rubik's Cube enthusiast.

Grady was eager to discover more about PLCs through the project. "I learned a lot about mechanical skills and I learned PLC programming language," he said.

As an added bonus, the students' feat garnered interest from international news agencies. The students received a signed letter from Erno Rubik, the inventor of the puzzle. Furthermore, they continue to work on decreasing the solution time and hope to achieve recognition in *Guinness World Records*.

Students gained a range of benefits from the project. "From an educational perspective they learned everything they were supposed to and more," said Philip Mease, '05, ECE technician and advisor, who is pursuing an M.S. degree at Rowan. "When you have projects that students are really motivated about, they work a lot harder."

"We combined cutting-edge technology — hardware, software and fabrication — and presented it in a fun and interesting context," said Dr. Shreekanth Mandayam, ECE professor and chair.

ECE graduate student **Karl Dyer**, '10, and undergraduates **Zachary Grady** and **Joe Ridgeway** (left to right) work on the Rubik's Cube-Solving Robot project.



# COE students bring engineering education to the City of Camden

Senior mechanical engineering major Salvatore De Santis was a godsend for CHAMP.

The program — Creating Higher Aspirations and Motivations Project — is headquartered at Rowan's Camden campus. It has provided Saturday classes coordinated by the Engineering Outreach Office for students in Camden and other public school districts.

De Santis first worked with CHAMP during spring 2009. When he realized how few Saturday sessions included an engineering module, he got serious.

"Most years they filled about two or three of the close to 14 dates CHAMP runs," De Santis said. "Knowing a lot of the presidents of the Rowan engineering clubs, I called in a bunch of favors that people have owed me and begged the rest, and I was able to fill every date."

Activities led by Rowan engineering organizations ranged from constructing paper helicopters and parachutes to building sound-producing circuits and model towns

made to withstand simulated earthquakes. Dr. Paris Von Lockette, associate professor of mechanical engineering and faculty advisor, oversees the program.

"Not only are our students learning what engineering is, they are getting hands-on experience with engineering activities and interacting with College of Engineering students as well as engineering professors," said Winona Wigfall, director of pre-college programs at Rowan's Camden Campus.

De Santis can graduate worry-free. "What I volunteered to do last year has become a paid position, to ensure that when I move on someone will put in the time to do what I did." That someone is Pat Leung, who took over the role this year.

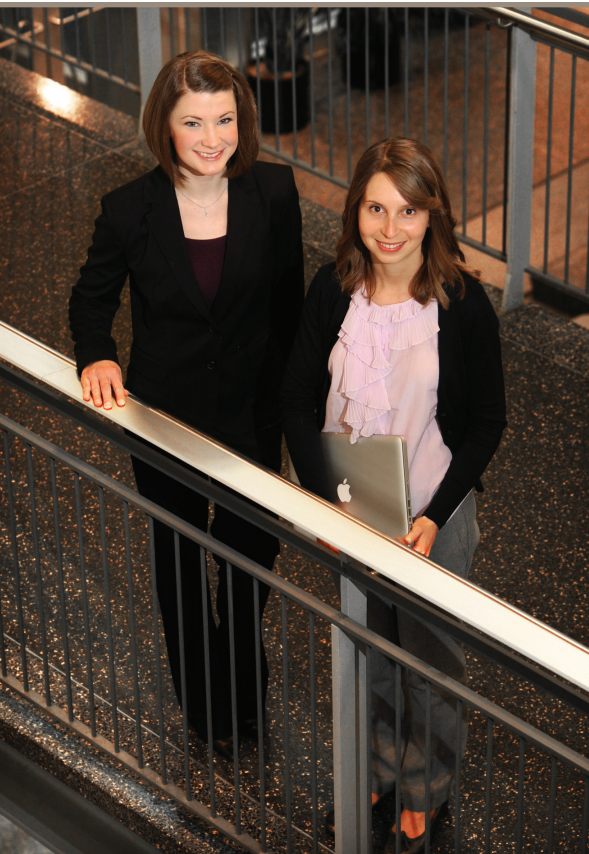
CHAMP isn't Rowan's only Camden-based outreach. On Feb. 11, 25 science, technology, engineering and mathematics students from Leadership, Education and Partnership (LEAP) Academy University Charter School visited Rowan's Glassboro campus for a demonstration of the College



Students from the LEAP Academy University Charter School enjoyed hands-on engineering projects during a recent visit to the College.

of Engineering's Cave Automatic Virtual Environment (CAVE®).

Of talking to the LEAP Academy director after the visit, Dr. Mira Lalovic-Hand, Rowan's associate provost of Institutional Effectiveness, Research and Planning, said, "The LEAP students were so excited, and most of them added engineering to the top of their list of what they want to be when they grow up."



Pamela Kubinski (left) developed important skills for her Drexel Ph.D. research while working with Dr. Jennifer Vernengo at Rowan.

## College forges partnership with Drexel

When Pamela Kubinski, '09, a chemical engineering student from Jackson, began her master's research at Rowan University, she also began laying the groundwork toward earning a Ph.D. in biomedical engineering from Drexel University.

Thanks to a new partnership the College of Engineering is forging with Drexel University, many Rowan engineering students may someday follow in her footsteps.

The College recently inked an agreement enabling electrical and computer engineering students to engage in joint research at Rowan's College of Engineering toward a Drexel Ph.D. — a collaboration that should be expanded soon to other Rowan engineering disciplines.

Dr. Jennifer Vernengo, assistant professor of chemical engineering, who advised Kubinski at Rowan, eagerly awaits this advance. "It would be great to have an official program where fantastic students could work on a joint project with Drexel," said Vernengo, who has many collaborative projects with the Philadelphia-based university. "They could get their master's degree from Rowan and their Ph.D. from Drexel, work-

ing with faculty at Rowan and at Drexel."

Kubinski, who is writing her master's thesis, will have the option of continuing her Rowan spinal cord research with Vernengo and her collaborators at Drexel, Drs. Anthony Lowman and Itzhak Fischer, while earning her Drexel Ph.D.

She explained that her Rowan research gave her a head start on her Ph.D. work.

"When I started my master's research, I began working on culturing cells and getting involved in the tissue engineering aspect, and that is exactly what I'm going to be working on for my doctorate," she said. "I'm ahead of everyone in my classes when it comes to the lab work because I've already been exposed to that."

The partnership between the universities will promote collaborations between the two institutions, with numerous benefits for everyone involved. "Drexel can benefit from our high-quality students who have undergraduate experience through our clinic program here at Rowan, and our faculty also can benefit from the program because it would allow us to conduct doctoral-level research through Drexel's Ph.D. program," Vernengo said.



## Annual event strengthens industry connections

Rowan Hall buzzed with activity during Industry Day, drawing everyone from students seeking career opportunities to industry partners and representatives curious to learn more about the innovative College and its industrious students.

The March event began with an engineering job and internship fair in the atrium. Beneath a vibrant banner bearing the slogan “Innovation Starts Here,” students connected with company representatives, gaining valuable career direction.

This segment drew numerous companies and organizations from the region, such as Anheuser-Busch, which is seeking information technology professionals and engineers. “It’s a great opportunity to meet students, especially having an engineering career fair. It’s very specific,” said Stacy Daley, people supervisor, Anheuser-Busch Inc., Newark Brewery, Newark, N.J.

“There are a number of innovative and unique things going on here.”



**Zachary Grady, '11,** shares his experiences in creating the Rubik's Cube-Solving Robot during Industry Day.

The event also attracted companies looking for additional ways to collaborate with the College.

Brad Strauss, a service account representative for Honeywell Building Solutions, Marlton, is well aware of the College's accomplishments through the company's service relationship with the University and is exploring internship opportunities with the College. “I wanted to seek other ways that we could partner with Rowan to benefit both Rowan and Honeywell,” he said.

Throughout the day, faculty members led visitors on tours of clinic research projects, and department chairs highlighted the expertise of faculty and students during a presentation.

Events such as Industry Day not only benefit the College, but also the region. “There are a number of innovative and unique things going on here, and I think it offers the region and all of New Jersey an opportunity that we didn't have 10 years ago for students to find very viable and valuable opportunities in the sciences and technologies,” said Lisa Morina, executive director, Gloucester County Department of Economic Development. “Not only do they get educated here, but then they stay here. We want to try to cultivate that.”

## Students and faculty celebrate engineering

Whether they gained the inside scoop on preparing for licensure exams, coached middle school students on hands-on activities or blew off steam in a faculty-student basketball game, campus engineering students found many ways to celebrate their future profession during Engineers Week 2011, part of an annual nationwide event.

“Engineers Week is about the celebration of the engineering profession, and it raises awareness of the profession so we will have a new generation of engineers to address the issues that will face us during the next decade and beyond,” said Dr. Steven Chin, interim dean.

A blood drive kicked off this year's events on Feb. 10, followed by a variety of career-building activities the week of Feb. 21 — such as the Career and Graduate School Fair and the IEEE Student-Professional Awareness Conference. The event also included the Get Licensed, Get Ahead presentation, featuring engineering alumni Jamie Gooch, '05, and Brad Summerville, '01, M '02, who provided advice on obtaining professional engineering licenses.

Attracting tomorrow's engineers is a critical focus of Engineers Week. This year, eighth-graders from Estell Manor School and seventh-graders from Bridgeton's Quarter Mile Lane School toured campus and participated in hands-on projects with engineering students.

“Through these activities, students learn more about engineering,” said Melanie Basantis, engineering outreach director. “During this event we don't just sit at tables. We have fun promoting engineering.”

“A lot of students in elementary and high school realize they enjoy math and science and they like hands-on learning, but a lot of times they miss the chance to experience what engineering really is,” said Brighid Burgin, Tau Beta Pi president-elect and a junior chemical engineering major from Mantua Township. “When they enter college, they don't know about the opportunities available to combine math and science with real-world applications. I feel like we give ... students the opportunity to experience them through campus outreach programs before they get to college so they're ahead of the game.”



Students explored opportunities at the Career and Graduate School Fair during Engineers Week.



“Protecting a water source with La Ceiba’s children,” a photo taken by chemical engineering major **Brighid Burgin**, ’12, was selected as one of the winners in the Engineers Without Borders–USA 2011 Photo Contest. In this photo, **Juan Roche**, a Rowan mechanical engineering graduate student, stands with the children at a well in La Ceiba, El Salvador.

## Experience engineering this summer

K-12 students and teachers can experience the excitement of engineering through these summer programs at Rowan University College of Engineering:

### Rowan Introduction for Students to Engineering (RISE) High School Engineering Workshop, July 5 to 7, 2011

High school students participate in hands-on projects, labs and campus and industry tours.

### High School Scholars Program, July 10 to 14, 2011

Rising high school juniors and seniors experience hands-on activities, seminars and field trips.

### Engineering Clinics for Teachers, July 10 to 14, 2011

Educators learn engineering basics through this program, which helps them integrate engineering content into their classrooms.

### Project Lead the Way Teacher Training, July 17 to 29, 2011

Select high school teachers learn to implement project-based, pre-engineering curricula to motivate students to pursue engineering and technology careers.

### Attracting Women Into Engineering (AWE) Workshop for Middle School Girls, July 19, 20 and 21, 2011

These single-day workshops introduce girls entering seventh or eighth grade to various engineering disciplines and focus on hands-on experiments and professionalism.

### Young Profs Summer Camp, July 27, 2011

Through this week-long camp, 11-14-year-olds with high-functioning autism and Asperger’s syndrome explore numerous academic programs, including an engineering segment on July 27. Contact John Woodruff at woodruff@rowan.edu for details.

Visit [www.rowan.edu/engineering/k-12](http://www.rowan.edu/engineering/k-12) for additional information on programs.

### Engineering News

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