ROWAN UNIVERSITY COLLEGE OF ENGINEERING

Looking Ahead

Rowan University College of Engineering
Annual Report 2009-2010

FOCUS ON THE FUTURE

The last year has brought us devastating earthquakes, a damaged oil well gushing relentlessly into the Gulf of Mexico and countless other crises that have tested the greatest minds of the day.

Future generations — including the engineers we are now educating — will continue to be tested as global challenges emerge.

Only a decade into the new millennium, the Rowan University College of Engineering celebrated 10 years of graduates who gained solid footing in preparing for many of these looming challenges. With their innovative hands-on, minds-on training, these graduates are equipped to confront the complex problems of tomorrow.

MESSAGE FROM THE DEAN

Envisioning a bright future as the Rowan University College of Engineering was created, Founding Dean James Tracey said, "Build it and they will come!" Students did and they still do. Every year we turn away bright, ambitious and prepared students who want an engineering education from Rowan. To accept all applicants would be unfair, as we carefully manage capacity within the College.

Still, even with the demand for our program, we, like real estate experts, know that simply "building" is not enough to sustain success. It requires the continuing vision of many people.

I have thought about why we have triumphed in close to a decade and a half, rising from a new and unknown entity to ranking 15th among the 187 engineering colleges in our peer group (*U.S. News & World Report's* "Best Colleges," September 2009). As we gathered in April to celebrate 10 years of engineering graduates, Dr. Tracey and Mr. Henry Rowan — whose $100-million contribution to our University in 1992 made our College possible — joined alumni, industrial partners, faculty and friends to celebrate our milestone. The energy of that group made it clear that key components that support our success include outstanding faculty and students, industry involvement and a curriculum that promotes real-world problem solving from the first day of class.

As you read this annual report, you can appreciate the quality of our faculty, as exemplified this year by Dr. Kauser Jahan, who achieved national recognition when she received the American Society for Engineering Education 2010 Sharon Keillor Award for Women in Engineering Education. And you can learn more about the accomplishments of our students by reading about those who win awards such as one of the top prizes in the IEEE Presidents' Change the World Competition and the ASEE International Division Best Paper Award.

Industry investment in education that prepares students for their careers is showcased in our engineering clinics, where industry sponsored 70 percent of the 121 faculty-managed clinics for juniors and seniors during the past year. Our annual report highlights clinic news that spans The Gambia in Africa to grease traps in our local wastewater systems, and we can see that becoming a multi-year clinic sponsor serves regional industries and many others as well.

I invite you to enjoy the highlights of our activities in this annual report. Please contact us if you would like more information about our outreach and clinic projects or want to explore opportunities to work together. We welcome your energy and interest as we look to the challenges of tomorrow.

Regards,

Dianne Dorland

Dianne Dorland
Dean of Engineering

Kyle Fitzpatrick, Taylor Kirk, Paul Natalino, Dr. Hong Zhang and Nick Mirto (left to right) test kite technology as part of the EHAWK engineering clinic.

ENVISIONING REAL-WORLD SOLUTIONS

SEARCHING FOR GREEN ENERGY SOURCES

The sky's the limit in the College of Engineering's search for alternative energy sources. With this philosophy in mind, students in the EHAWK (Electricity from High-Altitude Wind With Kite) engineering clinic have concentrated on harnessing wind power to generate electricity. To accomplish this task, they are using large parasail-type nylon kites that attach to a generator. A joystick directs a remotely controlled mechanism attached to the kite and guides it into a steady-state figure 8 to generate the maximum amount of power.

Kites have potential advantages over wind turbines as an alternative energy source. "As you ascend higher, the wind gets stronger," said Dr. Hong Zhang,

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In our engineering clinics — the keystone of our engineering program — students solve real-world problems for industry, organizations and the community, developing an extensive range of skills for the future. Here are just a few of the 2009-10 highlights:

Probing for New Solutions

Restoration and improvement of urban infrastructure are critical challenges for the future. In Camden, Rowan students are tackling these problems, collaborating with the Camden-based Cooper's Ferry Development Association and Cramer Hill Community Development Corporation. Using the Cave Automatic Virtual Environment, known as a CAVE®, a 100-cubic-foot virtual reality system located at the South Jersey Technology Park in nearby Mantua Township, they are investigating stormwater management solutions for areas prone to frequent flooding.

"Our students are successfully using advanced technology from the engineering research labs to address infrastructure problems in cities such as Camden, thereby providing an impetus for the creation of livable communities that can attract a high-tech and prosperous workforce," said Dr. Shreekanth Mandayam, professor and chair, Electrical and Computer Engineering.

Other engineering students, under the direction of Dr. Zenaida Otero Gephardt, associate professor of chemical engineering, are studying solutions to wastewater and grease trap problems in a clinic sponsored by JSH international LLC, Mt. Laurel. Using humic substances (naturally occurring substances in soil) extracted from highly selective peat sources, the company developed a product that has a significant effect on the degradation of fats, oils and greases (FOG) in wastewater and grease traps. Use at industrial sites has proven the product enhances the rate of FOG degradation in grease traps and wastewater

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Student Evan Forosisky tests the tree-climbing device he and classmates designed, as Dr. Beena Sukumaran (second from left) and students Stephen Schwandt, Michael Panko, Mark Zielinski and Christopher Marra (left to right) observe.

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pumping stations. The company turned to Rowan University to study and optimize the effectiveness of the product in these environments.

"This project is an excellent opportunity for Rowan to collaborate with industry in a green technology effort with significant business potential," said Gephardt.

Imagining Ecological Alternatives

Our growing population increasingly strains our supply of natural resources. In light of this challenge, engineering students have been working with Dr. Tom Merrill, assistant professor of mechanical engineering, and Green Leaf Innovations LLC, Cherry Hill, to research and design a mass-market product to reduce water use in the shower. In addition, they developed plans for an odor-reduction product for the bathroom for this company.

While applying theory they studied in class, students learned about product development and how to work with an external business sponsor. "In the end, it's a wonderful story that they get to tell in their resumes," Merrill said.

Students work to convert a 2003 Ford Ranger to an all-electric vehicle.

As our culture strives to reduce its dependence on fossil fuels, students have been working with Dr. Krishan Bhatia, assistant professor of mechanical engineering, to convert a 2003 Ford Ranger into a totally electric vehicle. The engineering clinic was sponsored by Dr. Jess Everett, professor of civil and environmental engineering, and conducted in the South Jersey Technology Park. In the fall, students began mapping out their plan to convert the vehicle to electric, creating a design that met their budget as well as other critical targets. During the spring semester they constructed the vehicle. "One of the big things that we were trying to do was build an electric car that had good range and a decent charge time and could get to highway speed on a very low budget," Bhatia said.

Focusing on Life-Saving Technology

Although climbing a tree may seem like child's play, in some developing countries doing so can be a matter of critical sustenance. With this challenge in mind, students developed a tree-climbing device in a clinic led by Dr. Beena Sukumaran, professor of civil and environmental engineering. They pursued this project after reading that people in many developing countries need to climb palm trees to harvest fruit without any safety devices. "There are lots of deaths associated with it," Sukumaran said. "People are also gravitating away from it because of the dangers."

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During 2009-10, **238 juniors and seniors** and professors worked on a total of **121 clinic projects.** Of these projects, **70 percent** were externally supported by companies and government organizations.

Student Tom Cosentino works with Dr. Jennifer Vernengo on the synthesis of a polymer that is intended to replace damaged intervertebral disc tissue.

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Students created three revisions of the device and hope to pilot it during a future Engineers Without Borders™ trip so people in those developing countries can test it and provide feedback. "That's extremely important," she said. "Local people may have certain preferences and only certain materials may be available. We may not have taken that into account. But for a tree climber like this, they're just using steel materials with easily obtainable connections, so it should be pretty easy to build anywhere in the world with minimal tools. The device will make the process of tree climbing much safer."

Exploring Advanced Remedies

In the health arena, students and Dr. Jennifer Vernengo, assistant professor of chemical engineering, are collaborating with Drexel University to develop a specially formulated hydrogel that may one day be injected into patients with spinal cord injuries. In this engineering clinic, students are determining how quickly proteins are released from the hydrogel, which may help facilitate spinal cord healing. In another clinic, which is a collaborative project with Dr. Jennifer Kadlowec, associate professor of mechanical engineering, and Dr. Cristina Iftode, associate professor of biological sciences, students are synthesizing the hydrogel that could replace tissue and heal damaged intervertebral discs in the back.

"Currently, my students are learning how gel properties, such as porosity and composition, affect its interaction with cells and biological tissues," said Vernengo. "I look forward to continuing to develop these projects with my students at Rowan. I am also excited about the potential for developing future research collaborations with Cooper University Hospital." (Rowan is partnering with Cooper to create Cooper Medical School of Rowan University.)

For people whose speech has been garbled by stroke or illness, College of Engineering students and professors envision creating an electronic speech synthesizer to help these patients communicate more clearly.

Although strokes can have many consequences, in some cases they impair speech but not the mind. When a stroke chokes off patients' ability to communicate, however, they may feel isolated and consequently withdraw from life. "It is hard to imagine how closed life can be if you have a sharp mind but cannot carry on a conversation," said Dr. Robert Krchnavek, associate professor of electrical and computer engineering, who is working on this project with Dr. Ravi Ramachandran, professor of electrical and computer engineering.

Engineering clinic research is still in the early stages, but professors see hope in developing this device. "The final objective is to build a device tailored to that particular person, which, when he or she talks into it, transforms slurred speech into intelligible speech," Ramachandran said. "What an amazing increase in quality of life if we can succeed in opening up this communication channel to so many people," Krchnavek said.

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associate professor of mechanical engineering. "They're making the wind turbines higher and bigger, but there is a limit to how high you can build them."

Dr. Hong Zhang

This technology could have many applications. When natural disasters strike, kites could be valuable in recovery efforts, especially in remote zones without fuel for emergency generators. "It's very easy to ship a kite," Zhang said. "They can attach it to the generator and fly the kite to generate power. When you have power, you can sanitize the water and perform other tasks," he said.

With innovative ideas like this at the College of Engineering, new alternative energy solutions soon may be within reach.

Placement rate for
May 2009
College of Engineering graduates:
91%

During a campus-wide career fair, students discussed career and internship opportunities with businesses and organizations.

SPOTLIGHTING OUR INDUSTRY PARTNERS

Since its inception, the College of Engineering has been fueled by extensive support from individuals, businesses and organizations, with hundreds of industrial partners providing scholarships, serving as advisors, sponsoring clinics, offering internships and hiring graduates.

During 2009-10, 238 juniors and seniors and professors worked on a total of 121 clinic projects. Of these projects, 70 percent were externally supported by companies and government organizations, including DuPont Co., the Federal Aviation Administration, Inductotherm Corp., Johnson Matthey PLC, K-Tron International, NASA, the National Science Foundation, the New Jersey Department of Transportation, PepsiCo Inc., Pfizer Inc., Sunoco Inc., the U.S. Navy and The Walt Disney Co.

In February, the University held a campus-wide career fair, providing an opportunity for businesses and organizations to meet with students to discuss career opportunities and internships.

The College showcased its state-of-the-art labs and innovative projects at Industry Day in March. This event enabled organizations to explore potential collaborations with the College and learn about the engineering clinic program and dozens of projects

with businesses and government organizations conducted on campus and at the South Jersey Technology Park.

"There's no doubt Rowan Engineering's partnerships are critical in helping us educate outstanding engineers. But time after time we hear from those partners how exceptional our students' work has been and how important our research has been for their projects," said Rowan's engineering outreach director, Melanie Basantis. "Industry Day allows us to demonstrate some of our capabilities for current and prospective partners."

The Samuel H. Jones Innovation Center at
The South Jersey Technology Park

STRENGTHENING ALLIANCES

A long-time ally of the College of Engineering, Public Service Enterprise Group (PSEG) Nuclear, a major corporate entity in southern New Jersey, has consistently hired Rowan interns and graduates. The company now plans to strengthen its alliance with the College by sponsoring a clinic.

"There are a number of companies that are now in their 10th year in participating in that program," said Robert Braun, senior vice president of PSEG Nuclear, Hancocks Bridge, who recently joined the Rowan University Foundation Board of Directors. "We're looking forward to having that distinction as time goes forward."

This connection would serve the College and PSEG well. "The college's curriculum promotes hands-on engineering education," Braun said. "We very much have a hands-on operation in 24/7 electric generation, so that's a superb fit."

The company also seeks to attract local talent. "A number of these students were born and raised in the state — or at least in the tri-state area — and their families are here, so their roots are here," Braun said. "We find it has real value to us in terms of the sustainability of our business that these folks want to work and live in this community."

PSEG was the major corporate sponsor of the College's Celebration 2010 (see pg. 21) and hosted a field trip for Rowan's Introduction for Students to Engineering (RISE) participants. RISE introduces high school students to the field of engineering and familiarizes them with the engineering program at the College of Engineering. "That fits into our long-term needs," Braun said. "We see a lot of retirements on the horizon for our workforce, and right now we're looking at extended operation for our current plants and possibly looking to build another plant, so we're going to have a significant need over the next couple of years. We're finding that the earlier we can reach people about careers in the nuclear industry, we can get them hooked and cultivate that over the years."

High school students learned about opportunities in engineering while touring PSEG as part of Rowan's Introduction for Students to Engineering.

INVESTIGATING NEW EDUCATIONAL STRATEGIES

Dr. Ying (Gina) Tang (center) suggests potential game improvements to students David Carbonetta, Richard Jassel and Nickolas Ernest Kowalski (left to right).

From the boardroom to the classroom, technologic advances have had a tremendous impact on the world. Faculty members are capitalizing on these innovations to bring a new dimension to education and broaden students' perspectives.

Seeing New Opportunities

Although traditional music appreciation courses can enrich students' lives, a new course offers unique insight about music within the context of engineering. This year, Electrical and Computer Engineering teamed up with Rowan's Department of Music to pilot a general education course combining the mathematics of music signals, music theory and hardware- and software-based production tools to teach electronic music composition.

"We want to give the students a broad perspective that promotes creativity using both engineering and aesthetic aspects of music composition," said Dr. Linda Head, associate professor and associate chair, Electrical and Computer Engineering.

The College also is implementing a favorite technology of today's students — animated video games — to help them strengthen engineering literacy and problem-solving skills.

"As we know, the computational technology has significantly changed teaching and learning, so we saw that there's definitely a need to bring those changes into the classroom," said Dr. Ying (Gina) Tang, associate professor of electrical and computer engineering. Because engineering students' schedules are packed with requirements, faculty sought to develop online games to replace certain laboratory activities in engineering courses.

The project began in September with a grant of just under $200,000 from the National Science Foundation (NSF). Dr. Xiufang Chen, assistant professor of reading at Rowan; Dr. Sachin Shetty, assistant professor of electrical and computer engineering at Tennessee State University; and the students working with Tang are using Vizard, a software application for construction of 3-D virtual reality environments to build scenarios for real-world problem solving. When completed, these role-playing games will enable students to become on-screen characters who must solve engineering problems.

Planning Strategies for Success

A five-year $600,000 grant from the NSF Division of Undergraduate Education to support engineering provides financial assistance to qualified students — as well as all-important tools to help them build a bright future.

The grant competitively funds four-year scholarships of up to $3,000 annually for freshmen entering Rowan Engineering in fall 2009 and fall 2010 and is known as S-STEM: Scholarships to Enhance the High-Tech Workforce of Southern New Jersey.

As an added plus, it provides educational support and creates learning communities for the scholarship recipients, which may provide a model for further expansion in the future. Students participating in this program live in a residence hall room, suite or floor with fellow engineering students; share two classes each semester during their first year of college; and participate in activities to help them focus their interest in engineering and get a preview of their academic future by visiting junior and senior engineering clinics and classes.

"The program helps students quickly create support groups for studying and doing homework," said Dr. Jess Everett, professor of civil and environmental engineering. "It also helps them create relationships with professors."

Freshman Profile 2009-2010

Average SAT (Verbal + Math) of incoming class:
1264

Average GPA: 3.67

Number of students entering:
165

John Martinson Jr. (at rear of van) and Zachary Januik, a graduate student in mechanical engineering, assist students in racing a car around a virtual track.

(Inset) The Rowan Engineers on Wheels van.

BROADENING OUR SCOPE

FOCUSING BEYOND OUR BORDERS

In the United States, we often take for granted the ability to fill a glass with clean, clear water with the turn of a faucet. In developing countries, however, it's much harder to tap this vital resource.

Students working within the Rowan chapter of Engineers Without Borders™ (EWB) traveled to La Ceiba, El Salvador, in March 2010 as part of a project that began in 2007 to devise a water purification and distribution system so residents will have access to clean drinking water.

"This is probably one of our most complicated projects so far because we've looked at a number of solutions," said Dr. Jess Everett, EWB advisor and professor of civil and environmental engineering. "We probably will pull

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As we look to the future, the College of Engineering will further partner with industry and area schools in outreach programs designed to spark an interest in technology in the engineers of tomorrow.

"We need to make sure that we're preparing the next generation of engineers, making sure that students know what engineering is, exposing them to engineering, exposing them to the fact that they can do engineering and that engineering is fun," said Melanie Basantis, Rowan's engineering outreach director.

Offering a Glimpse of the Future

Carrying this concept to K-12 students in South Jersey and beyond, the College of Engineering's Engineers on Wheels program took to the road in February, with a vibrantly colored van packed with activities to introduce various engineering disciplines to students.

"The United States is falling behind other countries in producing engineers and other professionals in technology fields, so it's critical we reach our youth and introduce them to the world of engineering, science, technology and math," said Dr. Kauser Jahan, professor and chair, Civil and Environmental Engineering. In the van, students enjoy hands-on projects, such as exploring a flight simulator and building a truss bridge on a computer. Outside the van, they conduct experiments, ranging from making lip gloss to treating contaminated water to exploring the strength of materials. The program is supported by the Lawrenceville-based Edison Venture Fund; John Martinson Sr., managing partner; and John Martinson Jr., an investment associate with the company.

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Students Steve Gardner, Ben Berwick, Alan Norton, Ashish Wadkar, Nicole Bacher and Khyati Sonpal (left to right) build structures as part of CANstruction.

During the second annual Melon Propellin', contestants launched watermelons at targets using catapults they designed and built.

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Many other K-12 programs also expose students and teachers to opportunities in engineering. Those programs include:

- Attracting Women Into Engineering, introducing girls entering seventh and eighth grades to engineering
- Engineering Clinics for Teachers, enabling teachers to work with engineering faculty and bring projects into their own classrooms
- Project Lead the Way, inspiring middle school and high school students to pursue a career in engineering and technology
- Rowan's Introduction for Students to Engineering, featuring laboratory clinics, engineering activities, campus and industry tours, and mentoring by College students and professors
- High School Scholars, a program for high school seniors considering a career as an engineer or technology teacher
- Creating Higher Aspirations and Motivations Project (C.H.A.M.P.), serving seventh- through 12th-grade students

Reaching the Community

As well as nurturing young minds, the College nourished the community when it hosted CANstruction last fall. During this annual design exhibition and contest of the New Jersey Chapter of the American Institute of Architects (AIA-NJ), students competed to design and build structures with thousands of cans of food that were ultimately donated to local charities after judging.

Architects, engineers and professors mentored students during this event, which was sponsored by the AIA-NJ and the College's student chapter of the American Society of Civil Engineering.

"The students recognized these are tough economic times and many families in South Jersey are hurting," said Dr. Douglas Cleary, associate professor of civil and environmental engineering. "It was nice to be able to collect 5,000 cans of food to help the community."

Other student professional societies also play a role in the College's outreach efforts. Rowan's chapter of the Society of Women Engineers (SWE) raised funds for the American Cancer Society's breast cancer and ovarian cancer research by selling ribbons, hosting a bake sale and participating in the annual Relay for Life at Rowan University, as well as displaying posters to raise awareness of breast and ovarian cancer research. In addition, SWE sponsored Flying Bananas, where C.H.A.M.P. students built foam gliders designed to carry a banana and fly from the second floor of Rowan Hall. The project was a fun way for students to simulate aircraft design, showing them the many

options and issues associated with an efficient design while maintaining passenger safety.

The student chapter of the American Society of Mechanical Engineers hosted its second annual Melon Propellin', where contestants applied basic engineering principles to design and fabricate trebuchets (a type of catapult) to launch watermelons at targets to receive points.

Student professional societies also include chapters of the American Institute of Chemical Engineers, American Society of Civil Engineers, Engineers Without Borders, IEEE, New Jersey Water Environment Association and Tau Beta Pi National Engineering Honor Society.

The Society of Women Engineers at Rowan sponsored Flying Bananas, working with C.H.A.M.P. students to build foam gliders designed to carry a banana and fly from the second floor of Rowan Hall.

Young students in La Ceiba received homework help from Juan Roche, a graduate student in mechanical engineering.

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water from the river and put it through a bio-sand filter, pump it into a water tank and distribute it to some public faucets in the village."

Students traveled to The Gambia in Africa in January 2010, working to restore the critical Kuntaur Road built in the colonial era that repeatedly is washed out by flooding during the rainy season. Students will find ways to improve the road so that it will not be washed out and eventually turn over the project to a contractor. "Once the contractor does the work, then we'll work with the locals to keep it repaired but also move on to other projects and some water-related issues," Everett said.

EWB was introduced at the University in 2003, after Dr. Yusuf Mehta, EWB founding advisor and associate professor of civil and environmental engineering, attended a conference in Boulder, Colo., almost a decade ago. "We saw the excitement in the students there. I thought, 'Let's start this here,'" Mehta said.

Brian Fischer (ME 10) of Manchester, president of the Rowan chapter, has been involved in the club since his sophomore year. He traveled to The Gambia, working on one of two teams to obtain soil samples and check elevations.

"It's definitely given me a lot of experience," Fischer said. He appreciates the perspective he gained while helping those in a developing country as well as the experience he attained from managing real-life projects. "Managing projects is a big responsibility. It's not easy to coordinate projects, especially with overseas communications," he said. "It's a real-life project. It's not just a small classroom assignment."

Three children from La Ceiba pose for the camera.

Since 2003, approximately 150 students from the Rowan Engineers Without Borders chapter have completed projects in Thailand, South Dakota, Senegal and The Gambia that have benefited approximately 2,000 people.

CONCENTRATING ON CAREER SUCCESS

Hands-on projects and real-world internships give students a head start in developing the insight and expertise they will need to solve the problems of the future.

Allison Dickey (ME 11) from Stevensville, Md., secured an internship in the Research and Development Department at Paul Reed Smith Guitars, Stevensville, Md., working on drafting and 3-D modeling, as well as prototyping and design. "I actually was able to help design a new pickup, cases, fingerboards, jigs and winding tools for their 25th anniversary guitars," she said. "I got to design a jig to push the pickups together to be soldered."

Dickey appreciated the hands-on nature of her internship. "I now understand the importance of communication between the designing company and the manufacturing company through drawings," she said.

At Northrop Grumman Shipbuilding, Newport News, Va., **Steven Malsbury (ME 10)** from Medford landed an internship in structural engineering for submarines, approving installation or changes to the installation of equipment aboard the many ships in the Los Angeles Class. "The best part by far was to be able to take a tour of the shipyard and see the newest aircraft carrier and submarines at various stages of completion," he said. After graduation, Malsbury attained a full-time position in mechanical engineering for submarines at Northrop Grumman Shipbuilding.

David Schiavi (ChE 10) from Wilmington, Del., secured an internship at Citrus Products Inc. at its facility in Port Newark, N.J., a storage and distribution center for orange juice. Schiavi performed a variety of tasks, such as completing necessary documentation, participating in inspections and designing an in-house presentation. "My experience with Citrus Products Inc. has helped me realize what areas of my studies are important to the food industry," Schiavi said. "I have gained the ability to focus and prepare for what I want to do after I graduate."

Gaining experiences such as these has helped Rowan graduates surpass the competition in the job market and academia.

Yousef Ghotok (ChE 09) of Pitman, an associate engineer at PSEG Nuclear, Hancocks Bridge, monitors daily trends in plant systems, performs long-term analyses and troubleshoots problems.

Ghotok continues to use the knowledge he gained in college. "PSEG Nuclear is not very chemical engineering based, but my chemical engineering degree and the Rowan curriculum gave me a very broad understanding of every engineering discipline, so even though I wasn't mechanical or electrical based, I did have a knowledge foundation to get in, learn and actually develop into a well-rounded engineer."

Eric Nette (ChE 09) of Worcester, Mass., recently earned a master's degree in fire protection engineering from Worcester Polytechnic Institute in Massachusetts and is pursuing a Ph.D. at that institution. His Rowan education provided a solid foundation for his graduate studies, particularly group projects and his thermodynamics course. As he interviewed for positions, prospective employers were impressed by his engineering clinic experiences. "At all of my interviews I just kept talking about my junior/senior clinic activity. They loved that," he said.

Yousef Ghotok (ChE 09)

SHOWCASING ACHIEVEMENTS

Faculty and Students Earning Admiration

Dr. Kauser Jahan

Dr. Kevin Dahm

Dr. Stephanie Farrell

Since opening its doors, the College of Engineering has featured first-rate faculty members who continue to earn recognition for their accomplishments. The following are among those who received major awards in 2009-10:

Dr. Kauser Jahan, professor and chair, Civil and Environmental Engineering, received the competitive 2010 American Society for Engineering Education (ASEE) Sharon Keillor Award for Women in Engineering Education in recognition of her distinguished accomplishments.

Dr. Kevin Dahm, associate professor of chemical engineering, received the 2010 Distinguished Teaching Award of the Middle-Atlantic Section of the ASEE. The ASEE Middle Atlantic Section is committed to excellence in the instruction of engineering and engineering technology students and annually recognizes an outstanding engineering or engineering technology teacher from the section.

Dr. Stephanie Farrell, associate professor of chemical engineering, was the 2010 National Effective Teaching Institute (NETI) Fellow during the NETI three-day workshop, which is held each year before the annual meeting of the ASEE.

ROAD SCHOLARS EYING NEW SOLUTIONS

Students and faculty are paving the way to more environmentally and economically friendly roads in the College's new state-of-the-art Binder and Recycled Materials Lab (BRM) at the South Jersey Technology Park in nearby Mantua Township.They are working on a number of projects, including research for the New Jersey Department of Transportation (DOT) and industry. One DOT project is examining the use of increased percentages of re-claimed asphalt pavement (RAP) when paving highways. "The state currently allows up to 25 percent, and it would increase that amount," said Dr. Yusuf Mehta, associate professor of civil and environmental engineering. Therefore, Rowan students and faculty are examining how an increase in reclaimed materials would affect pavement performance. "In New Jersey there are huge unused stockpiles of RAP," he said.

Dr. Yusuf Mehta

A second DOT project focuses on the Multiple Stress Creep Recovery test, where students and faculty will evaluate a potential new specification for polymer-modified binders, said Aaron Nolan (MSE 06), a civil and environmental engineering technician.

The BRM Lab expects certification soon. "Our plan is to start with certification of the binder lab and establish ourselves and then eventually become certified in other construction materials," Mehta said.

Dr. Douglas Cleary, associate professor of civil and environmental engineering, received the 2010 New Jersey American Society of Civil Engineers Educator of the Year Award. This award is presented to an outstanding educator who has contributed substantially to the field of civil engineering.


Dr. Douglas Cleary

Two College of Engineering students, **Allison Daniello (ME 10)** from Manalapan and **Kelli Martino (ME 11)** from Dennisville, each received $4,000 scholarships from Lockheed Martin Corp.

Daniello also received the highly competitive $1,500 Jerry Kilby Memorial Scholarship from the Professional Engineering Society of Southern New Jersey, which is awarded to the student most likely to improve the image of the engineering profession.

Two engineering students received awards at the annual New Jersey Water Environment Association Conference: **Ryan Agostini (CE 10)** from Vineland received the Daniel Bigler Award for outstanding undergraduate research, as well as first prize in the Undergraduate Poster Competition; and **Shu Xu (MSE 10)** from Galloway received the Louis Fontanelli Award for outstanding graduate research.

The following students won awards at the IEEE Regional Student Activities Conference:

Kevin Montgomery (ECE 10) of Sewell and **Cliff Kaelin (ECE 12)** of Malaga won first place in the Project Showcase.

Sara Davis (ECE 13) of Westfield won second place in the Physics Competition.

Nick Kowalski (ECE 11) of Woodbury Heights; **Zach Grady (ECE 11**) of Audubon; **Joe Ridgeway (ECE 11)** of Norwalk, Conn.; and **Dwight Bedford (ECE 11)** of Hewitt won third place in the Brown-Bag Competition, competing to design a circuit with only a certain number of components in a specific amount of time.

Dr. Beena Sukumaran, professor of civil and environmental engineering, and the following students won the 2010 ASEE International Division Best Paper Award for "Establishing Entrepreneurial Opportunities for the Developing World Using Engineering Design": **Kevin McGarvey (MSE 09)** from Williamstown; **Michael Panko (MSE 10**) from Perkasie, Pa.; **Michael Kerbaugh (ME 10)** from Marlton; **Gabriel Posluszny (CE 11)** from Manasquan; and **Anthony Cavalier**, a math major from Sewell.


Dr. Beena Sukumaran

Kevin McGarvey's entry, "Engineering Innovators Without Borders: Human-Powered Grain Crusher," was one of the top prize winners in the IEEE Presidents' Change the World Competition last summer. He and his teammates — **Jesse Hill (ME 09)** from Sewell; Panko; **Michael Biggs (ME 09)** from Turnersville; and **Nicole Bacher (CE 10)** from Washington Township — received a $2,500 prize and the title "Exceptional Student Humanitarian."

Overall Student Enrollment: Fall 2009

Total number of undergraduate students:

529

Total number of graduate students:

89

Total Number:

618 students

A BRIGHT FUTURE FOR THE ROWAN UNIVERSITY COLLEGE OF ENGINEERING

Celebration 2010 — commemorating 10 years of graduates from the Rowan University College of Engineering — allowed us to celebrate the many successes of the Rowan University College of Engineering since the first class graduated in 2000, and it also enabled us to ponder the future of a very fine engineering school.

Without a doubt, the College's future is brighter than ever before. Core faculty and staff remain committed, energetic and excited about preparing young engineers, and they also are positioned to take on new opportunities for the College and its students.

The South Jersey Technology Park at Rowan University provides additional laboratory space, new research opportunities and the ability to attract innovative faculty and researchers to Rowan University. We expect the same impact when collaborations begin with Cooper Medical School of Rowan University, which Rowan is creating with Cooper University Hospital.

To forecast the technology of the future, I was taught to look at the breaking-edge research of today and see how it will apply tomorrow. When I consider current research conducted by Rowan engineering faculty, it excites me to know how ready they are for the major challenges of the 21st century.

Dr. Thomas Merrill's research on a cool-guide catheter focuses on cooling the heart and reducing the amount of tissue that dies during a heart attack. This research ultimately may be extended to the new medical school.

Without the Cave Automatic Virtual Environment®, now located at the South Jersey Technology Park, Dr. Sheekanth Mandayam and other faculty and students would not have the tool to obtain major research funding such as that for the Constellation rocket systems that will be launched for moon and Mars missions.

Feeding our planet and helping those in other parts of the world have always been fundamental needs and will continue to require the best efforts of our society. Dr. Zenaida Gephardt's research on finding better ways to feed salmon at Chilean fish farms and the invention of Dr. Beena Sukumaran and her students of a bicycle-operated grain crusher that can be driven from village to village in India to process grain and generate income for a poverty-stricken region of our planet satisfy needs that will only grow.

Sustainability is a key component of the new "green engineering" that is quickly gaining momentum. Numerous engineering faculty members are conducting "green" research, ranging from the creation of photovoltaic devices to biofuels to waste treatment. An essential element is teaching sustainability principles to the next generation, as exemplified by Dr. Stewart Slater's efforts as he develops green education courses.

Finally, we need to not only nurture the next generation of engineers but also excite our youth about the opportunities of an engineering education. Cultivation of exceptional engineers continues to be a passion for Dr. Kauser Jahan. Jahan's Attracting Women Into Engineering, which focuses on middle school young women, and Engineers on Wheels, which brings engineering to K-12 students at their own schools, are wonderful vehicles to bring many youth into engineering who otherwise might miss the opportunity.

As I begin my own retirement from Sony, I reflect on my 15-year involvement with the Rowan University College of Engineering that began with curriculum development, and now I look forward with confidence at a program that will help lead us into the future.

Chester A. Dawson
Chairperson, Dean's Advisory Council
Director, Site and Environmental Engineering
Sony DADC America's Region
Sony DADC

Henry Rowan shares his insights on the College with faculty, alumni and guests at Celebration 2010.

CELEBRATION 2010: PRAISE FOR THE PAST — PROMISE FOR THE FUTURE

With jazz strains drifting through the Rowan Hall atrium, faculty and staff, members of business and industry, and alumni gathered to celebrate 10 years of graduates of the College of Engineering on April 9.

The reception, part of Celebration 2010, sponsored by PSEG and supported by 12 other companies, celebrated the outstanding accomplishments of the faculty, students and alumni. The College itself was created through the visionary $100-million gift from South Jersey businessman and philanthropist Henry Rowan and his late wife, Betty. During this celebration, the College welcomed Mr. Rowan; Dr. James Tracey, founding dean of the College; and Robert Braun, senior vice president of PSEG Nuclear, Hancocks Bridge, as well as a number of business and industrial partners.

Over a relatively short period of time, the College of Engineering has built a solid foundation with support from business and industry, organizations and individuals. Countless industrial partners have provided program guidance, internships and scholarships to students; sponsored engineering clinics; and hired graduates. With its innovative hands-on, minds-on approach to engineering, the College of Engineering prepares its engineers with the vision and skills to meet the challenges of the future.

Clockwise on this page: Alumnus Joe Miller and his wife, Kellie Miller, enjoy Celebration 2010. Robert Braun speaks to guests at Celebration 2010. Dr. Steve Chin, associate dean of the College of Engineering, speaks with Dr. Parviz Ansari, dean of the Rowan College of Liberal Arts & Sciences. Henry Rowan and Dr. James Tracey, founding dean, are surrounded by College of Engineering graduates of the Class of 2000 at Celebration 2010. Henry Rowan; Dr. Dianne Dorland, dean; and Dr. James Tracey, founding dean, proudly celebrate 10 years of graduates of the Rowan University College of Engineering.

Capturing National Attention

Based on the 2009 peer survey of deans and senior faculty, *U.S. News & World Report* ranked the Rowan University College of Engineering 15th among the nation's best undergraduate engineering programs whose highest degree is a bachelor's or master's degree. Individual programs ranked even higher:

Chemical Engineering	**2nd**
Electrical and Computer Engineering	**9th**
Mechanical Engineering	**10th**

Rowan University
College of Engineering

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