

Engineering Earns High Ranking

Rowan's College of Engineering continued earning high marks from *U.S. News & World Report*, which for 2008 ranked the College 16th among the nation's 178 undergraduate engineering programs offering a bachelor's or master's degree. Rowan's individual engineering programs ranked even higher:

Chemical Engineering	2nd
Civil Engineering	11th
Electrical and Computer Engineering	8th
Mechanical Engineering	9th



College of Engineering

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2007-2008
Annual Report



Rowan University College of Engineering



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Engineering always has driven civilization's advances. The challenges we face have grown more complex, and the tools we use have grown exceedingly sophisticated. In the past century engineering recorded its grandest achievements.

That said, we face many future demands — some not yet imaginable — to help people and the planet thrive. The National Academy of Engineering has proposed 14 grand challenges in broad areas of human concern — sustainability, health, vulnerability and joy of living. Among them is the challenge to advance personal learning.

In this annual report's overview of the exciting world of engineering education at Rowan University, you can see how we advance the goal of learning for all of our students. We are one of the newest colleges of engineering in the U.S., and we continue to lead in educational innovation with our hallmark engineering clinics.

The engineering clinics have offered undergraduate and graduate students pathways for transformational research. Our students and alumni understand that engineering is responsive to human needs and that their efforts make a difference in lives all over the world. Our faculty members promote progressive concepts, focusing on such topics as sustainability as an intrinsic aspect of the engineering world through broad initiatives like the exploration of alternative energy sources or the ecosystem of an aquarium. Rowan Engineering professors are visionary, seeing the future through interdisciplinary ventures such as the potential heart-saving catheter developed by our newest mechanical engineering faculty member, Dr. Thomas Merrill.

I invite you to contact us if you would like more information about any of our projects or want to explore opportunities to work together. We welcome your energy and interest as we engage the grand challenges of the 21st century.

Dianne Dorland, PhD, PE
Dean of Engineering



Message from the Dean



An engineering team installs a photovoltaic solar energy system at the South Jersey Technology Park at Rowan University. Putting the finishing touches on the project are Andrew Hak (ECE '08); Dr. Peter Mark Jansson, associate professor of electrical and computer engineering; Dane Greene, a civil and environmental engineering major; and Ulrich Schwabe, a student in the engineering master's program (left to right).

Clinics Focus on Alternative Energy Sources

While motorists were fretting at the gas pumps and homeowners turned back their thermostats even further during the last year, students and professors in Rowan University's College of Engineering were looking for solutions to the energy crunch.

Multidisciplinary teams explored advances in solar and wind power and analyzed biodiesel emissions as part of the various 137 projects that students pursued through Rowan's engineering clinics, which provide them with hands-on experience through industry- and government-sponsored research.

Rowan Engineering students saw construction begin on a 3-MW photovoltaic (PV) system they helped design in Falls Township, Pa. When completed, the 12-acre facility will be the largest PV system in the U.S. east of Arizona.

Shedding new light on solar energy, students designed and evaluated a three-dimensional solar thermal collector developed by Medford, N.J.-based Helios Products, a collector capable of absorbing more energy than two-dimensional devices and at a reduced cost. Initially conceived for hot water heating, the process will be adaptable for home heating and cooling.

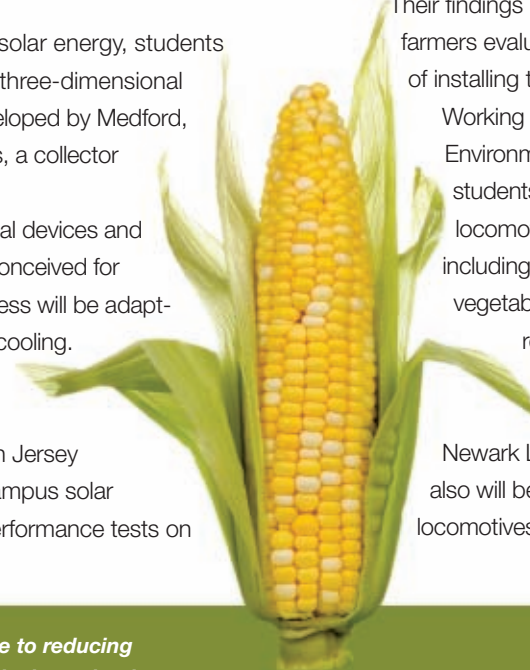
Students also worked with professors to analyze data at Rowan's new South Jersey Technology Park on two campus solar installations, conducting performance tests on

Japan's industry-leading Kaneka Corp.'s first thin-film amorphous-type system in the eastern U.S. and a 13.3-kW PV system using crystalline-Si technology designed by SunTechnics, a worldwide leader in the field of renewable energy that is based in Paoli, Pa. Both projects are an integral part of making the Tech Park a LEED®-certified (Leadership in Energy and Environmental Design) green building.

Rowan Engineering students continued assessing the potential of wind turbines to produce electricity in New Jersey using 30-meter-tall masts equipped with anemometers and data-logging systems at various sites.

Their findings helped municipalities and farmers evaluate the cost-effectiveness of installing turbines.

Working with the N.J. Department of Environmental Protection and NJ TRANSIT, students analyzed emissions from diesel locomotives operating on different biodiesel fuels, including several blends using 20-percent vegetable oils and animal fats. Rowan's research will help determine if biodiesel fuels can be successfully used to power ground support equipment at Newark Liberty International Airport. The findings also will be used to develop biofuels for use in diesel locomotives and home heating systems.



Rowan engineers contribute to reducing dependence on fossil fuels by investigating more efficient renewable energy routes for corn-to-ethanol biofuel processes.

Innovative

Rowan students and professors, including the Engineering student organizers, headed south again this year to help needy communities affected by Hurricane Katrina.



Students, Profs Making a Difference on a Personal Level

Rowan Engineering students traveled halfway around the world — and to one of the hardest-hit disaster areas of this country — to once again put their engineering skills to work during 2007-2008.

Working hand in hand with needy communities in Central America and Africa and Hurricane Katrina-devastated New Orleans, they experienced firsthand the impact of engineering on the world around them.

“It was great for them to practice their engineering skills and learn about the world,” said Dr. Jess Everett, professor of civil and environmental engineering, who led an Engineers Without

Borders-USA™ (EWB) trip to Central America in the spring. “All the skills they used will be valuable whether for Third World projects or work here in the U.S.”

In La Ceiba, an El Salvadoran town of 463 where more than 30 children have died in recent years from water-related illnesses, Rowan

students conducted soil samplings and land surveys as part of a project to tap into the underground water table. This will ultimately produce safe water from a new well via a gravity-powered distribution system. In Senegal, Africa, students designed a system of pipes and faucets so that women would not need to spend six hours a day collecting water for their families’ survival.



And, for the third year in a row, a Rowan crew spent spring break gutting and rebuilding homes in post-Hurricane Katrina New Orleans.

“This is a classroom away from a classroom. A lot of people think engineering is just technical. I like to think engineers see some social impact in what they do. Engineers help improve the quality of life.”

— Dr. Jennifer Kadlowec, Associate Professor of Mechanical Engineering



A historic statue of Andrew Jackson stands in Jackson Square in New Orleans.

Responsive



The 2007-2008 Baja team consisted of mechanical engineering majors Tricia Wright (in the driver's seat) and Daniel Batten; Steven Bardenhagen '08; Jason Sherrer; David Bound '08; Dr. Eric Constans, associate professor and chair of Mechanical Engineering; Joseph Biggs '08 and Paul Diglio (clockwise from lower left).

Rowan Engineers Take on Baja, Win Other Awards

Rowan engineers took on the Baja again this year in a project that is both clinic and competition.

With a Briggs and Stratton motor, brake calipers and a comprehensive guidebook, students constructed a vehicle they had designed to withstand the rigors of the Society of Automotive Engineers International Baja SAE®



contest. Their reward came from putting their engineering skills into action and placing higher than 75 other teams in the competition.

"It's one thing to deliver a product at

the end of a semester, and it's another to put it in a pretty harsh environment and see if it works," said Dr. Eric Constans, chair of Mechanical Engineering, who oversees the clinic project.

The Baja SAE® was one of many competitions open to students who participated in campus chapters of professional societies. Throughout the year, engineering students expanded their

engineering skills with papers and entries in other events sponsored by the American Institute of Chemical Engineers (AIChE), the American Society of Civil Engineers (ASCE), the American Society of Mechanical Engineers (ASME), IEEE (originally the Institute of Electrical and Electronics Engineers), the N.J. Water Environment Association (NJWEA), the N.J. American Water Works Association (NJAWWA) and the Society of Women Engineers (SWE).

Engineering students brought home honors in the regional ASCE concrete canoe competition and the IEEE Region II Student Activities Conference as well as earned recognition from the AIChE Delaware Valley Section, NJWEA, NJAWWA and more organizations.

“Repeated awards over many years are clearly convincing evidence of, and indicators that, the unique Rowan University College of Engineering clinic-based curriculum is achieving its intended outcomes.”

— Dr. Peter Mark Jansson, Associate Professor of Electrical and Computer Engineering



For the Baja SAE® clinic project, the engineering team designs, builds and races a rugged vehicle, starting with an engine, brake calipers and guidebook.

Accomplished

A Rowan team has been exploring the science and engineering involved in an aquarium and is developing lessons about the system to be used by the collaborating groups.



Faculty Members Engineer New Projects with Students

An aquarium is much more than a tank, water and fish. It's a window into a world of interacting systems, and it's also the basis of a Rowan Engineering project to teach students about science and engineering.

The collaborative project to educate the world's classrooms about the science behind a simple aquarium comes from an innovative idea developed by Dr. Kauser Jahan, chair of Civil and Environmental Engineering. She and her team have been working with the Adventure Aquarium, the New Jersey Academy for Aquatic Sciences (NJAAS) and Cumberland County College (CCC) to develop resources to be shared among the organizations. A \$150,000 grant from the National Science Foundation (NSF) supports the work, which will result in a new freshman reverse engineering clinic module at Rowan, lessons and training for the Adventure Aquarium and NJAAS, and resources for CCC.

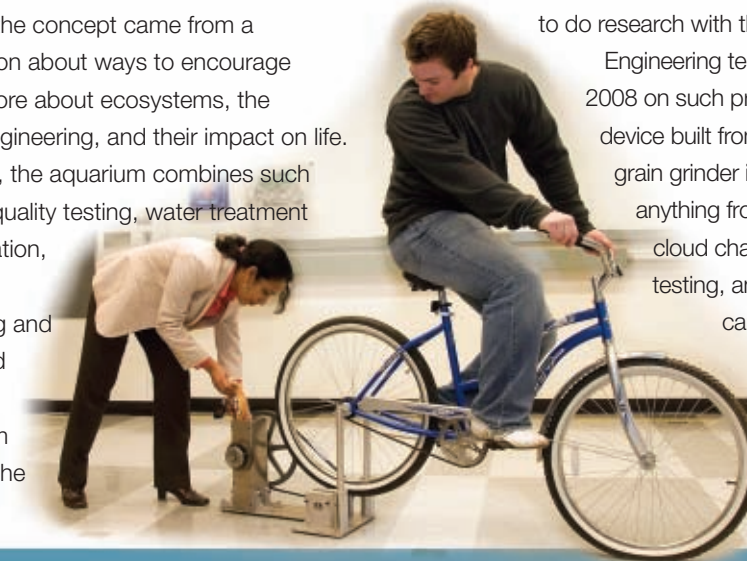
Jahan said that the concept came from a brainstorming session about ways to encourage students to think more about ecosystems, the environment and engineering, and their impact on life. According to Jahan, the aquarium combines such elements as water quality testing, water treatment processes, oxygenation, evaporative losses, remote data sensing and pollution issues, and NJAAS offers an educational program that can be part of the

effort. "The aquarium has many thousands of kids come there every year," she said. "They could learn more about engineering as an educational option."

That's just one of the multidisciplinary team projects in 2007-2008 led by faculty in the College. Another was led by Dr. Thomas Merrill, assistant professor of mechanical engineering, who under a \$950,000 grant from the National Institutes of Health is working with students to develop a "CoolGuide Catheter." The new catheter may be able to cool a heart much faster after a heart attack than existing technology, potentially saving heart tissue and lives.

Merrill said that his immediate goals are for the team to finish the construction and calibration of a mock circulatory system and to create a working console to test the catheter in the Rowan Engineering laboratories. "It has been my long-term vision to work with students and to do research with them," Merrill said.

Engineering teams also worked in 2007-2008 on such projects as a mechanical device built from a bicycle and aluminum grain grinder intended to process anything from corn to barley, an ice cloud chamber to be used for optical testing, and research on growing carbon nanotubes that could lead to potential applications for areas ranging from semiconductors to medicine.



Dr. Beena Sukumaran (left), associate professor of civil and environmental engineering, adjusts a bicycle-driven grain grinder for Joshua Bonzella, a civil engineering major. The grinder will provide a simple mechanical device for people in developing countries to use in processing anything from corn to barley.

Visionary



During an Engineers Week 2008 visit to the College of Engineering, Estell Manor Middle School students built a mechanical system to put a toy car in motion.

College Reaches Out to Tomorrow's Engineers

With wedge and wheel, pulley and lever, teams created a system that made toy cars go.

The teams consisted of eighth-grade students from Estell Manor Middle School and ninth graders from the Atlantic County Institute of Technology. The location was Rowan Hall, the College of Engineering building. And the toy car challenge was an outreach activity held during Engineers Week 2008. While visiting the College of Engineering, the students also toured Rowan Hall and the University campus, enjoyed a planetarium show and took part in an information session.

The purpose of the visit was to reach out to tomorrow's potential engineers and scientists. "We wanted to pique their interest in engineering," said Melanie Basantis, director of outreach for the College of Engineering.

From Attracting Women to Engineering (AWE), Rowan's Introduction for Students to Engineering (RISE) and Creating Higher Aspirations and Motivation Project (CHAMP) to Project Lead the Way (PLTW) and Engineering Clinics for Teachers (ECT), the College hosts several summer engineering programs for students and teachers.

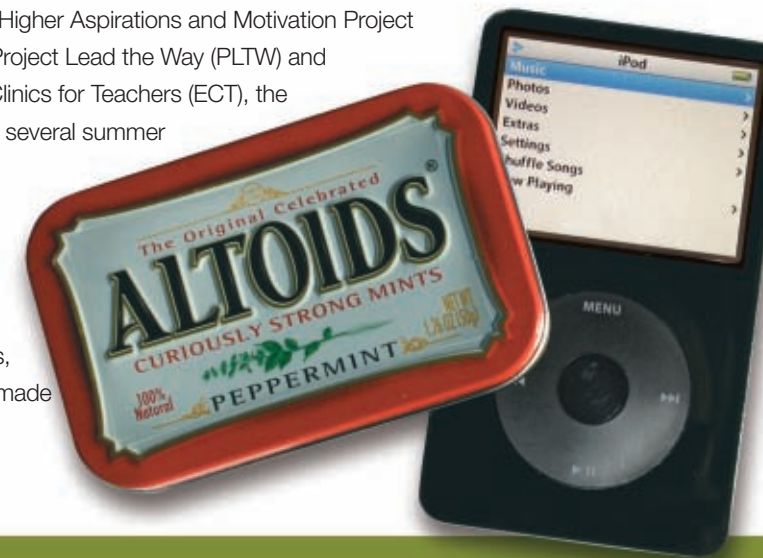
During the AWE sessions, teenage girls made lip gloss and

designed bridges. RISE participants from Pennsylvania, Connecticut and throughout New Jersey constructed bottle rockets and built iPod speakers from Altoid boxes. And South Jersey students in the summer CHAMP pre-college program attended engineering and other academic workshops.

Teachers and guidance counselors participated in two-week PLTW training programs held on campus.

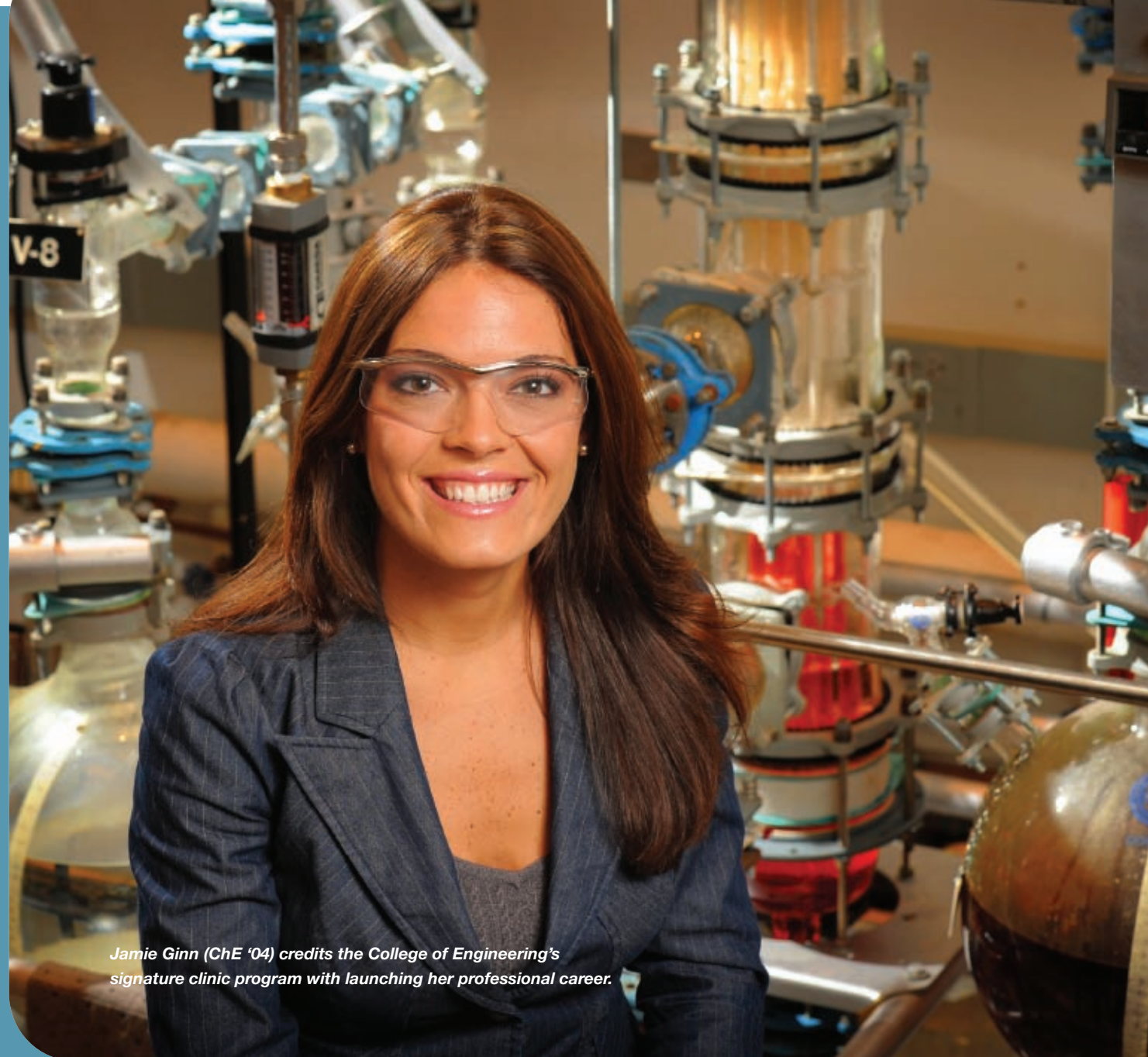
PLTW forms partnerships among middle and high schools, businesses and higher education institutions to provide students with the background needed to pursue science, engineering and technology. ECT, styled after the College's signature engineering clinic model, featured hands-on activities that the teachers could pilot in their own districts.

All the programs encouraged students to consider engineering as an educational possibility and aided middle and high school teachers in that work. "The programs convey that engineering can be interesting and something students like to do," Basantis said.



Rowan's College of Engineering hosts several programs throughout the year to encourage interest in engineering and technology.

Progressive



Jamie Ginn (ChE '04) credits the College of Engineering's signature clinic program with launching her professional career.

Rowan Alumni Explore Sustainability

Whether they are working in Colorado, California, Calgary or Delaware, graduates praise Rowan's clinic approach to learning in preparing them for professional challenges in the field of engineering. In fact, Jamie Ginn (ChE '04), a chemical engineer with DuPont's Engineering Evaluations and Sustainability Group, credits clinics with directly launching her career.

"I was in California making a presentation on the life-cycle assessment of technology to reduce idle emissions from semi-trucks, which related to a clinic project, and a woman from DuPont offered me her card. That led to an internship interview, where I mentioned I was also working on a biofuel clinic project. They all looked at each other because that was exactly what DuPont was exploring at the time," recalled Ginn, who researches biofuel production and life-cycle issues at DuPont today.

Rowan Engineering's team approach to problem solving is what has best served Dave Thatcher (CEE '00), an associate transportation/traffic engineer at

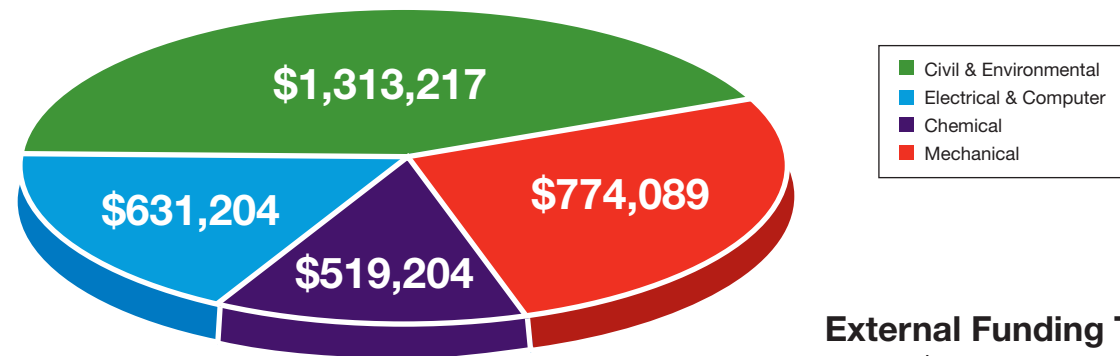
Stantec. Today, he is helping reduce the company's transportation footprint in Calgary, Alberta, Canada, working with staff members throughout Stantec's operations, as well as the city itself.

At Hewlett Packard in California, Amip Shah (ME '02) is working to reduce energy consumption and emissions too, exploring the sustainability of future technology for products and data centers. Amip and older brother Amol (ECE '00) also recognize the value of the communication skills honed through their clinic experience. "One of the unique things about Rowan is that the engineering program trains you to communicate with your team and the client, in both writing and speech," said Amol, a senior consultant at Statera in Colorado. "That's very important professionally, since often a client really doesn't know how to define a problem that needs to be solved. Being a strong communicator makes the job that much easier for everyone."

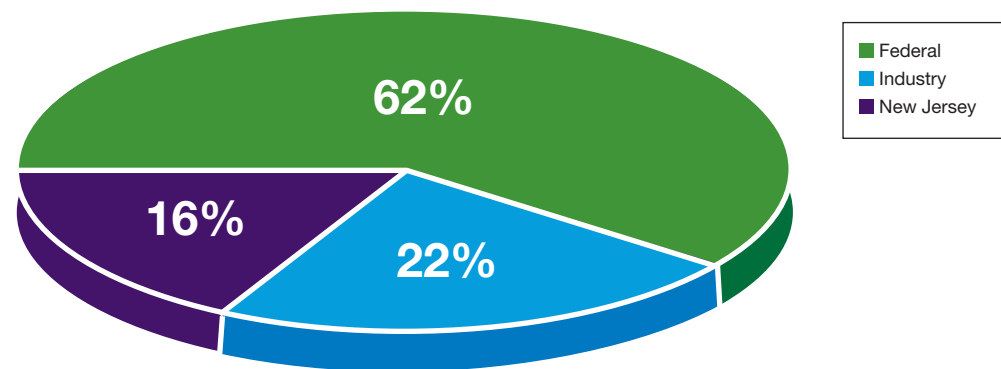


Successful

Grant and Contract Awards Fiscal Year 2008

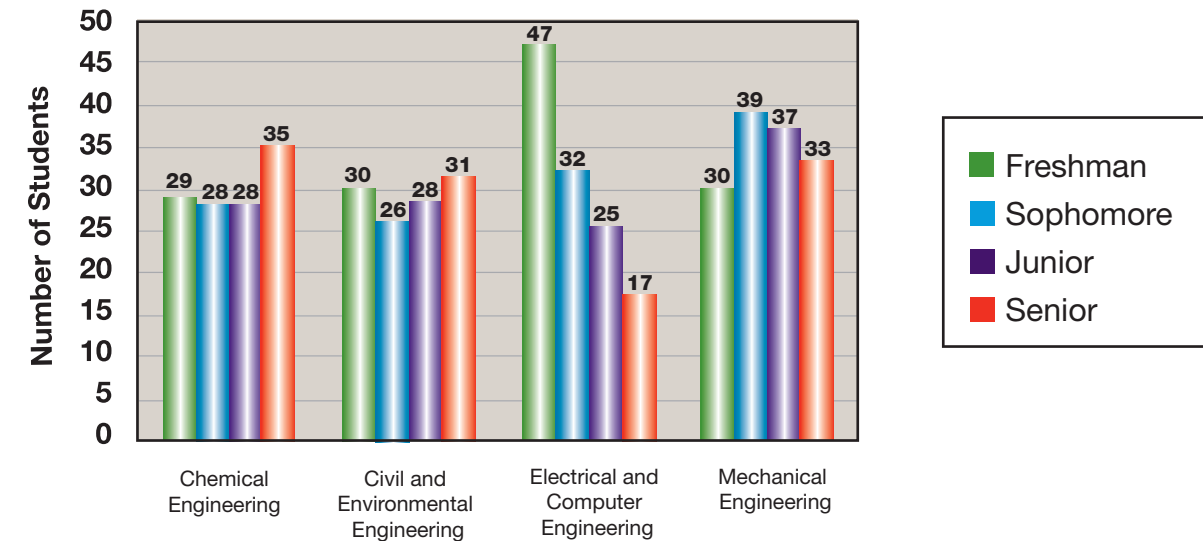


External Funding Total
\$3,237,714



Student Profile Fall 2007

Class Year and Program



Incoming Freshman Profile, Fall 2007*

SAT Score (Critical Reading)	598
SAT Score (Mathematics)	668
Grade Point Average	3.61

* Average statistics of students accepted into the engineering program

Grant and Contract Awards

Student Profile



Rowan Hall houses the University's College of Engineering.

Letter from the Chairperson

Early in 2008, we were pleased to learn that the Delaware Valley Engineers Week Council recognized something we have known for years — Dr. Dianne Dorland, dean of Rowan's College of Engineering, has made and continues to make an impressive contribution to the field. Selected to receive the Engineer of the Year Award from the regional council, she was cited in particular for her educational initiatives focused on making engineering exciting for students.

Dr. Dorland was named dean in 2000, assuming the helm of the Delaware Valley's newest engineering school. Since that time she has continued to build upon Rowan's innovative, nationally recognized, project-based learning environment and unique engineering clinics, which engage students in hands-on projects as soon as they enter the program. Her focus has been on preparing today's engineering students for the challenges that lie ahead and nurturing in them the confidence to greet each new challenge with enthusiasm.

That commitment goes beyond the students presently enrolled at Rowan. Through a series of initiatives, Dr. Dorland — along with the entire College — is working to stimulate an interest in engineering among tomorrow's students as well. Dr. Dorland represents Rowan on the New Jersey Consortium for Engineering Education, an alliance working to promote science, math, engineering and technology among students and incorporate engineering curriculum standards in secondary education. Also under her



leadership, the College has become the state affiliate for Project Lead the Way, a program to encourage high school students to pursue careers in engineering and technology.

The Dean's Advisory Council is proud to recognize Dr. Dorland's achievements and looks forward to our continuing joint efforts to make the Rowan College of Engineering the best in the country.

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

Dean's Advisory Council