In fact, it has become the single most significant source of private fellowships and professorships for female students and professors. Has awarded three CBL professorships to the same university in Luce (CBL) Program. This grant marks the first time the Program a $500,000 award from the Henry Luce Foundation's Clare Boothe. Recognizing the College's ongoing commitment to encouraging and Radisavljevic-Gajic, Seri Park and Nisha Kondrath with average in its percentage of female students and faculty. Villanova's College of Engineering has surpassed the national average in its number. In that regard, the 2012-2013 academic year has been a great success. In addition to receiving a $500,000 grant to support three new female professorships, Villanova's College of Engineering has surpassed the national average in its percentage of female students and faculty.

Villanova University President Gary A. Gabriele, PhD, Drosdick Endowed Dean Villanova College of Engineering

$500,000 GRANT REWARDS COLLEGE'S COMMITMENT TO WOMEN IN ENGINEERING

Since joining Villanova University seven years ago, Gary A. Gabriele, PhD, Drosdick Endowed Dean of the College of Engineering, has made it a priority to increase the number of female students and faculty in the program. In that regard, the 2012-2013 academic year has been a great success. In addition to receiving a $500,000 grant to support three new female professorships, Villanova’s College of Engineering has surpassed the national average in its percentage of female students and faculty.

Clare Boothe Luce Assistant Professors Verica Radisavljevic-Gajic, Seri Park and Nisha Kondrath with Mechanical Engineering Professor Amy Fleischer

Recognizing the College’s ongoing commitment to encouraging and supporting women in engineering, Villanova was the recipient of a $500,000 award from the Henry Luce Foundation’s Clare Boothe Luce (CBL) Program. This grant marks the first time the Program has awarded three CBL professorships to the same university in one year. Since 1998, the CBL Program has funded scholarships, fellowships and professorships for female students and professors. In fact, it has become the single most significant source of private support for women in science, mathematics and engineering in the nation.

The Clare Boothe Luce Grant recognizes the efforts of Villanova’s College of Engineering in opening more doors for female engineers. Under the leadership of Dean Gary Gabriele, the College provides a supportive atmosphere in which women succeed.

Rev. Peter M. Donohue, OSA, PhD Villanova University President

Dean Gabriele sees women on the engineering faculty playing a key role in encouraging female college students to pursue careers in this field. "To be able to attract more women to engineering first requires that we have women faculty to mentor and demonstrate to young women that engineering is a valid career path for them to consider. The Villanova College of Engineering has been working hard to increase enrollment of women engineering students and we have been able to raise female enrollments to almost 30% of our total, while also retaining female students at the same rate as men. Increasing the number of women faculty has been a key ingredient in that success, and the CBL award allows us to make a significant increase in the number of female faculty.

Women have made up 50 percent of the College’s new faculty hires over the past five years, including these Clare Boothe Luce Assistant Professors:

- Seri Park, PhD, Civil and Environmental Engineering
- Nisha Kondrath, PhD, Electrical and Computer Engineering
- Verica Radisavljevic-Gajic, PhD, Mechanical Engineering

As Dean Gabriele noted, the College of Engineering has also been successful in steadily increasing female enrollment over the last 10 years. The percentage of women in the fall 2012 freshman engineering class was 31 percent, compared to 19 percent in 2003. The national average for female engineering undergraduates is currently 18.2 percent.

"There is a good deal of misconception and miscommunication about the field of engineering that deters many women, but I believe we are in a time of transition when we’re seeing increasing numbers of women engineers assuming leadership positions in the industry," says Amy Haselrud, PhD, Professor of Mechanical Engineering. "As women engineers in leadership become more visible, they can serve as role models and mentors to the next generation of women engineers."

One of these women engineers in a position of leadership is Susan Ward ’80 CSE, head of Mergers and Acquisitions and Commercial Finance at Shell Oil Company. Ward believes one of the key ways to engage more women in this field is to spark their curiosity.

"Engineers get to work on some of the most amazing projects! We need to expose girls and young women to the types of projects undertaken by engineers, as well as the associated technologies," she says. Many factors have impacted the College’s success in attracting talented female students, including extensive outreach programming. Ward also credits the College’s success to high faculty-to-student ratios, a focus on quality teaching, the characteristics of faculty valued and hired by the University administration, and most importantly, its supportive environment.

Liesl Krause ’16, an electrical engineering major and member of the College’s Society of Women Engineers (SWE), agrees. "I think that Villanova’s College of Engineering attracts so many women because of their encouragement," she says. Liesl adds, "One of the reasons we get so few girls interested in engineering, and other STEM fields, is because there is still a stigma that women are not supposed to be interested in the subject. Even from a young age we grow up learning that Legos® and Bob the Builder™ are for boys, while Barbie™ and Dora the Explorer™ are for girls. One of the best ways that we can encourage women to join engineering is to simply remind them that they are capable of being an engineer."

Steady increase in percentage of female students in the College of Engineering Undergraduates: 18.2%

VILLANOVA UNIVERSITY COLLEGE OF ENGINEERING

ENJOY THE VEU!

Gary A. Gabriele, PhD, Drosdick Endowed Dean Villanova University College of Engineering

Inaugural Issue, 2013
Entrepreneurial activities have become a cornerstone of Villanova’s College of Engineering, where students are encouraged to think beyond traditional academic boundaries. The Entrepreneurship minor, launched in 2008, has seen a steady increase in enrollment, currently with 20% of freshman engineers participating. This hands-on approach aims to instill a “big picture” mindset that prepares students for real-world challenges.

The Engineering Entrepreneurship minor, for instance, teaches students how to create and execute business models. It is not only about technology; it’s about understanding the customer, societal impact, and ensuring one’s own career success. Students are exposed to entrepreneurship in various forms, from pitch competitions to design challenges.

In 2016, the University hosted the 24 Hour Imagination Quest, a challenge that brought together interdisciplinary teams to develop a product or idea in just 24 hours. This event was not only a test of their creative skills but also a platform for students to network and build relationships. The final result was a showcase of innovation, with teams presenting their ideas to judges and the broader community.

Paul Fells, then a senior in Engineering, was part of the winning team, Alpha Dogs. The team had to consider not just the technical aspects but also the business side, as they pitched their innovation to engineers and the general public. This experience highlighted the importance of a holistic approach to problem-solving.

Another notable event was the Villanova Student Entrepreneurship Competition (VSEC), which provided students with a platform to showcase their ideas. In 2013, the competition had over 50 participants competing for various awards. One team, “Fun Run,” designed a mobile application to encourage physical activity, demonstrating the ability of engineering students to combine technology with social impact.

These activities not only prepare students for the dynamic and competitive world of engineering but also foster a culture of innovation and entrepreneurship on campus. Students are encouraged to think critically, work collaboratively, and embrace the entrepreneurial spirit that is so critical in today’s rapidly changing job market.
Innovation Encounter

Last fall, five engineering students traveled to Detroit to participate in Lawrence Tech's Innovation Encounter national competition, which presents teams with a client’s real-world problem. Students have less than 24 hours in which to identify a solution, create a business case and develop a presentation for the judges. Working with business leaders from Microsoft, Ford Motor Company and Masco, the Villanova team (pictured above) brought home the second place trophy.

Meyer Innovation and Creative Excellence (ICE) Award

Named and endowed by Patrick Meyer ’74 VSB, the ICE Award recognizes students who possess a spirit of innovation, creativity and entrepreneurship that enhances Villanova University. A faculty award was also presented.

RENOVED LECTURER

Given the campus-wide interest in innovation, creativity and entrepreneurship, Mike Nuttall was the ideal past speaker for the 2013 Patrick J. Cunningham Jr. and Susan Ward ’80 Endowed Lecture Series. An internationally renowned technology designer best known for the original Microsoft mouse, Nuttall spoke on “Design, Innovation and Entrepreneurialism.” More than 300 engineering and business students attended the lecture where they were introduced to a broader understanding of design.

What’s Next?

For the 2013-2014 academic year, the College of Engineering will be offering three sections of its Creativity and Innovation course. Normally contained to one section, the increase is in response to interest from students campus-wide. For the first time, those in the School of Business and the College of Liberal Arts and Sciences have enrolled in the course.

It’s clear that Villanova students are developing a passion for a whole-brain approach to thinking, exploring, learning and creating. “We really are igniting change; I see the entrepreneurial spirit spreading across campus,” says Ed Dougherty. It’s one more characteristic that will set Villanova students apart.

A DECADE OF SUCCESS FOR THE CENTER FOR ADVANCED COMMUNICATIONS

With Moeness Amin, PhD, Professor of Electrical and Computer Engineering at Villanova, the grant dollars have been very good for Villanova University’s Center for Advanced Communications (CAC); however, the past two years have been exceptional. As he reflects on his 10th anniversary as CAC director, Dr. Amin is celebrating the Center’s national distinction as “excellent and rare,” and its largest and most competitive research grants to date.

National Recognition

A 2012 report prepared for the Industry-University Cooperative Research Center Program (I/UCRC) of the National Science Foundation (NSF) has named the Center for Advanced Communications (CAC) “an excellent and rare example of how to sustain and grow a research operation in a smaller university.” In the report titled “Research Center Sustainability and Survival: Case Studies of Fidelity, Reinvention and Leadership of Industry-University Cooperative Research Centers,” the authors credit leadership by a “very productive, forceful, and, from a grammatical perspective, entrepreneurial director” with the Center’s transformation and success. The report also identifies a number of additional factors that were critical to making the CAC successful:

• Five state of the art research labs
• Staffing which included hiring three research professors who are among the most productive faculty in the College
• Technical focus on communication technologies
• Academic integration and graduate education (the Center’s research professors serve as advisors to senior projects, masters, and doctoral students)
• Research quality that has produced a variety of scientific, technological and socially valuable outcomes

The authors note that, given Villanova’s focus on student education and community engagement, and when considering the school’s limited funding and research expenditures, it is “indeed an accomplishment for Villanova to mount the research talent, facilities and entrepreneurial mindset to successfully maintain, and in fast grow, the CAC.” They point to the Center as an “excellent and rare example of how to sustain and grow a research operation in a smaller university that is by no means nationally competitive in terms of sponsored research in science and engineering.” The report recommends the CAC to chief research officers or presidents in smaller universities that “nonetheless have aspirations to mount significant research programs in areas of niche expertise.”

$1.65M in Competitive Research Grants

Given that the NSF report describes Villanova University as “no means nationally competitive in terms of sponsored research in science and engineering,” it is delightfully ironic that the Center for Advanced Communications was recently awarded a total of $1.65 million from three different Department of Defense research agencies. In all three cases, Villanova was the sole award recipient.

The broad research areas covered by these awards is radar signal processing, focusing on urban and border sensing using electromagnetic waves and a minimum number of antennas and frequencies. The individual grants include:

• Office of Naval Research - $750,000, Dr. Amin (PI), and research professors Drs. Yimin Zhang and Fauzia Ahmad (CO-PIs). This is the largest sole competitive research grant Dr. Amin and the CAC have received since the Center’s inception in 1990.
• Air Force Research Lab - $450,000, Dr. Zhang (PI) and Dr. Amin (CO-PI).
• Army Research Office and Army Research Lab - $450,000, Dr. Ahmad (PI) and Dr. Amin (CO-PI). This spring, Dr. Amin and the CAC reached an important milestone with a $1.05 million three-year award for research into the use of radar technology to assist elderly who live alone. This is the Center’s first research project with direct civilian applications. Submitted to the Qatar National Research Fund under its National Priorities Research Programs (NPRP), the proposal is titled “Advanced Signal Processing and Emerging Sensing Technologies for Assisted Living.” Villanova will receive 35% of the funding as it partners on this research with Qatar University. Dr. Amin will serve as Principal Investigator for the entire project, including the Qatar part.

Ten-Year Review

To record the accomplishments of the past decade, Dr. Amin directed the publication of a CAC Ten-Year Review, which highlights the Center’s contributions to education, mentoring and research in the broad areas of:

• Communications
• Radar
• Satellite navigation
• Ultrasound

The Review also brings attention to some of the CAC’s major accomplishments as evidenced by its externally-sponsored research, publications, partnerships and international collaborations. Faculty, research fellows, international visitors and alumni are also acknowledged for their contributions to the Center’s decade of success.

Those interested in learning more about the Center for Advanced Communications can request a copy of the Center’s Ten-Year Review by contacting Janice Moughan at 610-519-4999. You can also visit the CAC website where a copy of the Review is available for download.

Engineering Dean Gary A. Gabriele, Ed Dougherty, Patrick Meyer and Stephan Scharra
VILLANOVA ALUMNI AND FRIENDS HELP ES2 DEVELOP RELATIONSHIP WITH NATIONAL INDUSTRY GROUP

In 2011, the National Science Foundation established the Industry/University Cooperative Research Center for Energy-Smart Electronic Systems (ES2), one of about 60 UIUCRC managed by the NSF in various U.S. technology areas. A partnership between Villanova University, Binghamton University, The University of Texas at Arlington and the Georgia Institute of Technology, the ES2 is committed to developing technologies that will make data centers— the lifeline of today’s businesses—more energy efficient, sustainable and cost-effective to operate. The ES2 Villanova site leader is Alfonso Ortega, PhD, the University’s Associate Vice President for Research and Graduate Programs and James R. Berk Professor of Energy Technology. While pleased with the Center’s growth in its first year, Dr. Ortega recently made a connection with the data center industry that he believes will have a significant impact on ES2 for years to come.

Improved by the Center’s research, ES2 industry partners encouraged Dr. Ortega to reach out to the 7x24 Exchange, one of the most important interest groups in the data center industry. Almost all of the current ES2 members belong to the organization and it was clear to them that there were obvious mutual benefits for the 7x24 Exchange to be aligned with the Center. Dr. Ortega took the first step in establishing the relationship by hosting the group’s regional meeting at Villanova in fall 2012. With the help of the 7x24 Exchange local chapter president and Villanova engineering alumnus Tom Reusche ’83 BSIE, Dr. Ortega successfully hosted the group’s meeting and at the same time raised awareness of ES2 with a key industry group.

Of the meeting’s approximately 100 guests, Dr. Ortega was surprised to discover the number of loyal Villanova alumni in attendance. Present was alumnus Dennis Cronin ’74, a 7x24 Exchange founder and one of the best known data center professionals in the country. Cronin is chief operating officer of Steel ORCA, a leader in the digital utility center industry. Dave Crocker, president of Steel ORCA (and interestingly, a former kicking coach for Villanova football), was also present and invaluable in helping to establish this collaborative relationship between the industry and academia. Dr. Ortega notes, “Dave Crocker, Dennis Cronin and Tom Reusche were key in bringing together the 7x24 Exchange and ES2. They seem to know everyone in the regional data center industry and are happy to make introductions. When I met them, I basically met everybody.”

Crocker feels the connection is important and recognizes what Dr. Ortega brings to the table. “Dr. Ortega clearly appreciates the value of blending commercial, environmental and academic interests in the data center industry. The 7x24 Exchange provides a unique instrument that allows him to capitalize on the talents and interests in the academic community for the benefit of this business and socially critical industry,” he says. Crocker is also pleased to have a former kicking coach for Villanova football on the research team.

“Based on Dr. Ortega’s presentation, the 7x24 Exchange regional meeting drew many Villanova alumni. Dr. Ortega shared the ES2 story at the 7x24 Exchange regional meeting, he was overwhelmed by the support and encouragement of alumni and the response from companies in Pennsylvania, New Jersey and New York. Since the meeting, he has networked with industry leaders, made many new business contacts and generated significant interest in the activities of the Center from potential new members.

The regional meeting was not Dr. Ortega’s only opportunity to interact with the 7x24 Exchange on a large scale. Crocker, Cronin and Reusche helped take the relationship to the next level when they introduced him to the organization’s national president, Bob Cavalliano, who invited Dr. Ortega and his graduate students to attend the national 7x24 Exchange annual meeting in Orlando in June 2013. This all-expenses paid opportunity allowed Dr. Ortega to present the ES2 to data center professionals nationwide. The interest in the Center was so great that Cavalliano has asked Dr. Ortega to be one of four keynote speakers for the 2013 national meeting. In addition to presenting ES2, there will also be an opportunity for him and Dave Crocker to announce the Steel ORCA partnership. “This invitation to speak is both a huge honor and huge opportunity,” says Dr. Ortega.

VILLANOVA ENGINEERING LAB ENGAGES STUDENTS IN BIO-OIL RESEARCH

Dr. Justin Sarto and his research assistants are not afraid to get their hands— or lab coats— dirty. “No matter how many times I wash mine, even with bleach, I can’t get it clean,” says PhD chemical engineering student Nidia Ruiz-Felix. The stubborn stains she’s referring to are bio-crude oils, the desired end-product of research she is conducting with fellow graduate assistants Rene Garrido and Nicole Hammer. Together they are working with a clean undergraduate, including seven seniors and a handful of freshmen, sophomores and juniors. The entire project is being supervised by Dr. Sarto and Dr. Charles Cox, both assistant professors in the College’s Department of Chemical Engineering.

Villanova University is part of a 14-member consortium led by the U.S. Department of Agriculture’s National Research Service at the Eastern Regional Research Center in Wyndmoor, Pa. With $6.8 million in funding from the Department of Energy’s Biomass Research and Development Initiative, the government, industry and academic partners of the consortium are working on converting agricultural and forestry byproduct materials into bio-oils. The three-year project aims to support research, development and demonstration on utilizing lignocellulosic biomass, i.e. switchgrass, forest wood waste and animal manures, for the production of bio-crude oils via a process called fast pyrolysis. For its part, Villanova has received $300,000 in funding to develop catalytic materials for use in the catalytic pyrolysis process and for upgrading bio-crude oil. The research is congruent with the initiatives of Villanova’s Biomass Resources and Conversion Technologies (BRCT) laboratory.

“The first stage in our research is to screen different types of feed stocks to see how they work in the bio-process system,” explains graduate student Nicole Hammer. “All biomass is not created equal,” notes Dr. Sarto. Different forms—from paper mill sludge to mushroom substrate— offer varying quality and energy output as bio-oils. “The goal is to try to understand how biomass properties correlate to the quality of the bio-oil products,” says Dr. Sarto. At its most simple utilization, the bio-crude oil produced can be used as a heating oil replacement, but its heating value is low. The goal is to find catalysts which upgrade the end-product for use in gasoline and diesel fuels, and ultimately discover a replacement for fossil fuels. Dr. Sarto is happy to point out the many opportunities that exist for interdisciplinary collaboration in the BRCT lab. From the lab’s director (“the workhorse”), built by a mechanical engineering student, to the bio-crude department’s growing switchgrass as energy feedstock, a variety of disciplines are involved in the process. Dr. Sarto is also delighted by the number of students, freshmen through seniors, engaged in the work. He finds, “They are driven and passionate about issues of sustainability and the environment.”

Students who take part in his freshman mini-project “Biofuel and Sustainability,” often stay committed to the research, volunteering their time throughout their undergraduate years and gaining valuable experience in the process. The BRCT lab serves as a prime example of what distinguishes an undergraduate Villanova engineering education from the competition—the opportunity for students, beginning in their first year, to learn from and work in the lab alongside graduate research assistants and their professors.

To learn more about research being conducted in Villanova’s Biomass Resources and Conversion Technologies laboratory visit www.villanova.edu/biomass.

Dr. Al Ortega and Tom Reusche ’83 EE

Villanova’s ES2 Center has been embraced by both the local chapter and national 7x24 Exchange, and Dr. Ortega gives all the credit to the Center’s industry partners. “They made it happen. These companies understand that the ES2 needs their support to survive and succeed,” he explains. To demonstrate its commitment to its member companies and to the sustainable future of its industry, the 7x24 Exchange has decided to become a member of the ES2 as well. Reusche explains the benefits of this partnership: “Members of the 7x24 Exchange can interact with Al and the research team, discuss the pertinent issues and challenges, and share their future-state vision. This interaction should help the ES2 focus on what is important to data center-related businesses, and develop technologies that these businesses will need and utilize in the future.” He and Ortega look forward to a long and productive relationship.

Graduate student researchers display various types of biomass materials.
MECHANICAL ENGINEERING STUDENTS FILE U.S. PATENT APPLICATION FOR NOVEL ORTHOTIC DEVICE

In spring 2013, a team of Villanova mechanical engineering students advised by Dr. Young Chuan, Assistant Professor of Mechanical Engineering, took first place among 20 departmental senior design presentations with their project "Drop Foot Push-Off Device." Members Brendan Kearney, Lester (Jim) McGeehen, Joss Swarting and Sean Wesselman not only faced the challenge of the project itself, but also the additional complication of collaborating with students at the University of Dayton, more than 500 miles away. With support from the McDonnell Foundation, the teams focused their efforts on creating an orthotic device to help those with drop foot, a physical condition which limits the ability to walk. They innovative and promising device that developed through this collaboration led to filing a U.S. patent application number 13/842,811 containing an impressive 36 claims.

On April 5, 2013, Villanova’s Drop Foot team members were joined on campus by their University of Dayton counterparts, as well as Dr. McCarthy and Dr. Daniel McFadden, PhD, PE, PTOE, '91 ECE, '94 MSCE, and George Merritt, the College’s Multidisciplinary Design Lab, and Edmund Daugherty '99 EE, '96 MSCS, Director of the Engineering Entrepreneurship program. Also in attendance for the meeting and luncheon were Ellen and Michael McDonnell, Dr. McCarthy’s 81-year-old Foundation sponsor.

I believe the technology now exists to make this happen. Our kids are infinitely closer to a solution that will change lives.

Engineering students take to the streets for real-world experience

When former Federal Highway Administration engineer Leslie Myers McCarthy, PhD, arrived at Villanova University’s College of Engineering in 2009, she had firsthand knowledge of the challenges faced by state transportation agencies, local municipalities and other public agencies. The state of the economy had left many of them with shrinking budgets and reduced staffing at a time when increasingly regulated programs required additional support. In this area of need, however, the economy had left most of them with shrinking budgets and reduced staffing at a time when increasingly regulated programs required additional support. In this area of need, however, the economy had left most of them with shrinking budgets and reduced staffing at a time when increasingly regulated programs required additional support.

Students are interested in participating in real-world projects before joining the working world. These projects not only help them apply their academic knowledge, but also train them to think like professional engineers.

Win-Win Opportunities

Dr. McCarthy first established partnerships with local municipalities and began advising student participants in 2009. In 2011 she was joined by department colleagues Seri Park, PhD, Clare Boothe Luce Assistant Professor of Civil and Environmental Engineering, and Edward Daugherty, PhD, PE, PTOE, ’99 EE, ’96 MSCS, Director of the Engineering Entrepreneurship program. Also in attendance for the meeting and luncheon were Ellen and Michael McDonnell, Dr. McCarthy’s 81-year-old Foundation sponsor.

How does sponsor Michael McDonnell feel about what these Villanova students have accomplished? “I think we moved the world!,” he says. “I believe the technology now exists to make this happen. Our kids are infinitely closer to a solution that will change lives.”

A Focus on Experiential Learning

Experiential learning is one of the cornerstones of Villanova’s top-ranked engineering program. Beginning in their first year, students are required to participate in multidisciplinary, hands-on projects. As they progress through the program, undergraduates have the opportunity to work alongside faculty on cutting-edge research projects. Through the College’s Multidisciplinary Design Lab, industry, government and other organizations are invited to partner with students on real-world projects. Service work also provides practical experience, along with an opportunity to give back to the community, one of the fundamentals of the University’s Catholic Augustinian tradition.

The resoundingly positive response to the students’ work has provided Drs. Park and McCarthy with more requests for help than they can fill. “I am often called in to the annual meeting of the Pennsylvania Municipal Managers Association, and the word spread like wildfire about our student projects,” says Dr. McCarthy. She and Dr. Park have more than a half-dozen projects currently underway.

You can download a copy of “Innovative Partnerships Help Inventory Traffic Signs” on our website (find this article in our News Archives) or at www.fhwa.dot.gov/publications/publicroads/. You can download a copy of “Innovative Partnerships Help Inventory Traffic Signs” on our website (find this article in our News Archives) or at www.fhwa.dot.gov/publications/publicroads/. You can download a copy of “Innovative Partnerships Help Inventory Traffic Signs” on our website (find this article in our News Archives) or at www.fhwa.dot.gov/publications/publicroads/. You can download a copy of “Innovative Partnerships Help Inventory Traffic Signs” on our website (find this article in our News Archives) or at www.fhwa.dot.gov/publications/publicroads/. You can download a copy of “Innovative Partnerships Help Inventory Traffic Signs” on our website (find this article in our News Archives) or at www.fhwa.dot.gov/publications/publicroads/.

My student research project and safety assessment report allowed me to achieve a further understanding of the transportation world through real-life data analysis.

Diana Chiaietta '13 CEE

5

STUDENTS AND FACULTY

Drop Foot team members discuss next steps for their project.

Villanova civil engineering students work on a traffic sign project.

STUDENTS AND FACULTY
SERVICE LEARNING
THAT SAVES LIVES

A commitment to service is one of the cornerstones of a Villanova University education. Each year, students from the College of Engineering take that commitment to areas of need around the world, working to solve complex global problems. Waslala, Nicaragua is one of a handful of regions in which engineering students have been particularly active. For more than a decade, their efforts have focused on water supply issues. During that same period, Villanova nursing faculty and students have been providing Waslala’s communities with healthcare education workshops. In 2010, the Colleges came together to address the region’s critical need for access to quality healthcare providers.

Rough, rugged terrain and great distances between Waslala’s 92 rural communities and the region’s only hospital mean that professional healthcare is often an hour or more away. During the rainy season, travel can be impossible. Under the leadership of Dr. Pritpal Singh, Professor and Chair of Villanova’s Department of Electrical and Computer Engineering, more than 35 faculty members and students from the College of Engineering, School of Business and College of Nursing have been engaged in an interdisciplinary telehealth project, which uses low-cost communications and computer technology to improve the quality of healthcare in rural Nicaragua.

How it Works

Though few communities have electricity and there is virtually no Internet access, the Waslala region does have fairly widespread cellular phone service, which makes a telehealth solution feasible. Using text messaging run on locally-based, inexpensive cell phones, the system allows local community health leaders (CHLs) to communicate data or questions about patient condition to hospital staff, who then communicate diagnoses or treatment recommendations back to the community. In emergency cases, CHLs can directly text the Ministry of Health nurse for immediate assistance. Though a fairly simple concept, the system requires signs and making simple health assessments. Villanova’s College of Nursing faculty and students address this human/medical dimension of the system.

To connect these rural sites to a remote monitoring center requires a cellular modem for an Information and Communications Technology (ICT) system to enable:
- Collection and transmission of patient information
- Data storage and organization in electronic health records
- Communication of assessments and remote medical assistance by health care professionals

Engineering students have been particularly active. For more than a decade, their efforts have focused on water supply issues. During that same period, Villanova nursing faculty and students have been providing Waslala’s communities with healthcare education workshops. In 2010, the Colleges came together to address the region’s critical need for access to quality healthcare providers.

Dr. Pritpal Singh and his team configure the computer system needed for the telehealth project.

Progress to Date

Since 2010, teams of Engineering, Nursing and Business students and faculty have made nine trips to the project site and have established a working system.

Among their specific accomplishments:
- Established several key partnerships with local organizations and universities
- Without question, what students on this project take the most pride in is know -ing that the telehealth system helps save lives. In one case, a 12-year-old girl with bacterial meningitis received the care she critically needed because a CHL was able to communicate her symptoms to the region’s Ministry of Health. There have also been five cases in which pregnant women were safely transported to the hospital when they hemorrhaged during labor. The recovery of these women and their newborns was the result of CHLs texting the Ministry of Health nurse to secure an ambulance.

Future Plans

A visit to Nicaragua in May 2013, Dr. Singh reported a successful and encouraging meeting with the Ministry of Health in Managua. The Ministry’s leadership has planned a late June visit to Waslala to review how the project is impacting healthcare in the region and to speak with some of the local leaders to determine what has been going well and where there have been challenges. Their goal is to learn the best practices from this pilot program and then work with the Villanova group to expand nationally. Together they will explore funding options for this expansion.

To date, the telehealth project has been supported by startup funding from the NCIIA, the National Collegiate Inventors and Innovators Alliance, as well as foundations including Halloran Philanthropies. A donation of cell phones and air time from Claro, Nicaragua’s main telecommunications provider, has also been essential.

Work on future student service trips to Waslala will call for upgrading systems and software capabilities, reinforcing health worker training and training new leaders, and measuring and reporting outcomes and the impact of the project.

For more information about the telehealth project, or to get involved, contact Dr. Singh at 610-519-7378 or psingh@villanova.edu.
CELEBRATING THE ENGINEERING CLASS OF 2013

This May, the College of Engineering celebrated another stellar graduating class. In addition to the many awards, scholarships and achievements they earned throughout their years at Villanova, commencement was a time to recognize those whose contributions went above and beyond.

The College’s 79 doctoral and Master of Science candidates were recognized and presented with awards by Dr. Gerald ‘Jerry’ Jones, PhD ’72, Senior Associate Dean for Graduate Studies and Research. The College of Engineering Outstanding Doctoral Student Award was presented to Peiman Naseradinmousavi for outstanding scholarship at the doctoral program and exemplary leadership and service to Villanova University and the College of Engineering. Receiving the Outstanding Graduate Student Award was Kailash Choudhary ’13 MSEE. Choudhary was also recognized with the Outstanding Graduate Student Certificate Award for the Department of Electrical and Computer Engineering. These students also received the Certificate Award from their individual departments:

- Ian P. Dardani ’13 ME
- Bennoah Anandhunore ’13 CEE
- Adrienne G. Donovan ’13 WRE
- Lauren A. Pugh ’13 SUST

Dr. Randy D. Weirton, Associate Dean of Academic Affairs, recognized and presented awards for undergraduate students. The following earned medallions from their individual departments for demonstrating academic excellence and leadership:

- Jelena Benc ’13 CEE
- Erica J. Sokoloski ’13 CEE
- Michael A. Casavella ’13 CEE
- Dong Wang ’13 EE
- Ian P. Dardani ’13 ME

President of the Engineering Alumni Society, Mr. John Hopp ’85 had the honor of presenting the prestigious Robert D. Lynch Award, which is given on behalf of the EAE to acknowledge a graduating senior for their outstanding academic achievements and exemplary dedication to serving the community. Representing the highest values of Villanova University and the College of Engineering, the 2013 Robert D. Lynch Award recipient was Ian P. Dardani ’13 ME.

For a look at the post-graduation plans of some of our 226 Bachelor’s degree graduates, visit our website at www.villanova.edu/engineering/about/meetgrads2013.

SUSTAINABLE ENGINEERING AT VILLANOVA – ENGINEER THE FUTURE by Kelly Willman

As the earth’s population grows and standards of living rise, the world faces increasingly complex challenges such as depletion of resources, environmental pollution and damage to ecosystems. At the forefront of making decisions that will have long-term implications for the planet, today’s engineers are called upon to not only meet today's global human needs, but to also provide sustainable access to the world’s resources for generations to come. Mr. William Lorentz, Director of Villanova’s Sustainable Engineering graduate program, says:

"Manifold is simply overusing the Earth’s resources. Developed countries like the U.S. contribute to millions of tons of waste and pollution annually, and businesses are now realizing the imminent need to transform our economy to live off nature’s income, rather than to continue to take withdrawals from nature’s capital. The sustainable engineering field is emerging to train engineers, scientists and others interested in this global economic transformation to approach sustainability issues from a holistic point of view."

Villanova’s Master of Science in Sustainable Engineering (MSSE) degree program is at the forefront of this emerging field. The program employs a whole-systems approach to problem-solving through a life-cycle lens. "The last decade of research has clearly shown we must rethink how we design products, services and the built environment. There needs to be a fundamental shift in design to include the entire lifecycle – from raw materials, through consumer use, and ultimately recycling and disposal. The role of a sustainable engineer is to evaluate the balance of resources within such stage of the lifecycle," says Lorentz.

One of just a few programs in the country and one of only two currently available in-campus or entirely online, Villanova’s MSSE degree is off to a successful start. Launched in January 2010, the program has graduated more than 30 students with another 60 currently working towards their degree. The critical advantage of earning an MSSE degree at Villanova is the program’s practical approach to current and future realistic situations. Students work in small teams to evaluate and solve problems that companies around the world are facing.

In describing the mission of the MSSE program, Lorentz references an excerpt from Coale to Coale, a book written by William McDonough and Michael Braungart, “We see a world of abundance, not limits. In the midst of a great deal of talk about reducing the human ecological footprint, we offer a different vision. What if humans designed products and systems that celebrate an abundance of human creativity, culture, and productivity? That are so intelligent and safe, our species leaves an ecological footprint to delight in, not lament?”

Sustainable engineering is engineering of the future, for our future.

Earn Your MSSE Degree

Like each of the College’s graduate programs, the Master of Science in Sustainable Engineering can be pursued on a full-time or part-time basis with courses available on-campus or via E-Learning. MSSE students select from four technical tracks:

- Alternative and Renewable Energy
- Watershed Sustainability
- Environmental Sustainability
- Sustainable Infrastructure and the Built Environment

Students are required to take core courses in Climate Change/Sustainability, Life Cycle/Impact Assessment, and Economic/Social Equity Integrates.

To learn more about the Sustainable Engineering program, visit www.msse.villanova.edu or contact program director Bill Lorentz, at bill.lorentz@villanova.edu or 610 519-6195.
SECURING THE FUTURE FOR VILLANOVA ENGINEERING

Villanova’s College of Engineering has experienced tremendous success over the past decade. For the past seven years, the school has been ranked among the top 10 undergraduate engineering programs in the nation by U.S. News and World Report. Interest in our undergraduate and graduate programs is at an all-time high, especially from students with exceptional academic and extracurricular backgrounds.

Along with the growth of our programs, the College continues to attract increasingly diverse faculty members. As highlighted in our Clare Boothe Luce story (p. 1), we are exceeding the national average for women professors, which in turn has helped us attract more women students to the College. New faculty have ignited a renewed interest in research and this has spurred the average for women professors, which in turn has helped us attract more women students to the College. New faculty have ignited a renewed interest in research and this has spurred academic and research areas for faculty, undergraduate and graduate students. The two-story, 5,430 square foot Hub will house the deans’ offices, seven offices for engineering staff, and a multimedia conference room.

This growth, coupled with the College’s tradition of balancing both theory and practice has placed significant demands on existing resources, including the availability of physical space to accommodate new faculty labs and expanded student labs and project space. Finding adequate space to accommodate our growth is the College’s highest priority. The College has completed an architectural study to determine how we might best meet our growth needs for the near term. The study identified three separate additions to the Center for Engineering Education and Research (CEER) building:

- Engineering Innovation Lab
- Student Learning Commons
- Engineering Hub

The new Engineering Innovation Lab will be a high bay space that provides students the opportunity to work on scalable real-world engineering projects in a facility designed to support the College’s teaching and learning model. Plans call for a two-story, 3,330 square foot open garage/high bay space, complete with a large, overhead crane.

The Student Learning Commons will offer much needed space for students to collaborate, work together in teams and gather in community – things the College routinely emphasizes. In addition to providing for the students’ needs, the 4,600 square foot Hub will also allow the College to reclaim valuable academic and research areas for faculty, undergraduate and graduate students. The two-story, 5,430 square foot Hub will house the deans’ offices, seven offices for engineering staff, and a multimedia conference room.

The expansion of the CEER building will be instrumental in the success of the College fulfilling its strategic vision to become one of, if not the, most innovative undergraduate engineering programs in the country. This $10 million capital project will be completely funded by donor support. If you are interested in one of the naming opportunities please contact Cynthia Rutenbar, Director of Major Giving, College of Engineering at cynthia.rutenbar@villanova.edu or 610-519-6973.

In order to expand the minds of future engineers, there needs to be new academic space to facilitate a collaborative environment that will help foster Villanova’s commitment to producing young engineers prepared to meet tomorrow’s challenges.

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