THE ENGINEERING EVOLUTION
THE COLLEGE OF ENGINEERING IS STRATEGICALLY EMERGING AS A PREMIER INSTITUTION FOR EDUCATION AND RESEARCH

BY SUZANNE WENTZEL

People on surprisingly different paths see an engineering college in their future. The challenge: finding the one that meets their needs.

Prospective undergraduates want to get the best education available. Newly minted faculty want to balance teaching and scholarship. Professionals want to earn advanced degrees in relevant areas. PhD-minded graduates want to do research in their know-how to better the world. Above all, they are committed to preparing men and women to succeed as engineers or scientists.

It helps that these visionaries work with Villanova-brand tools. They build upon a solid technical and liberal arts foundation, tap a rich Augustinian Catholic heritage, create multidisciplinary perspectives and inspire students to apply their know-how to better the world. Above all, they are committed to preparing men and women to succeed as engineers or in whatever career they choose.

This is the evolution that has paved the way for the College of Engineering to be ranked consistently among the best in the nation for its undergraduate education and, for the first time this year, its online graduate programs. This is the evolution that has helped the College attract pioneering researchers and millions in funding. This is the evolution that is entering an explosive phase of growth—one powered by For the Greater Great®: The Villanova Campaign to Ignite Change.

Left: Rosalind Wynne, PhD, associate professor of Electrical and Computer Engineering, and Jad Rabah ’15 MS do research on fiber optic sensor development. Right: Gary Gabriele, PhD, Drosdick Endowed Dean of Engineering, chats with students about their Villanova experiences.
are work through the Center for Advanced Communications.” By providing internships and partnering on projects, companies get a jump on recruiting capable, proven students. As Anthony Melone ’82 COE, executive vice president and chief technology officer at Verizon, notes, “Our partnerships enable us to remain close to the pipeline of next-generation talent, who will shape the technology sector for years to come.”

Industry partners benefit the College. They sponsor research, provide guest speakers and advisers, and offer feedback on curriculum. Often alumni in leadership positions drive these partnerships, says Keith Argue, assistant dean, External Relations. “They have been important in opening doors for us. We keep the doors open on our merits. Villanova has the technical rigor of other colleges. What separates our students is their leadership skills, their ability to work on diverse teams and their integrity.”

Indeed, the College focuses its energies on students’ professional development. It is solidifying its "professional spine" to ensure that students continually acquire and hone non-technical skills. Its goal is to graduate technically advanced, industry-seasoned, professionally adept engineers—an employer’s dream hire.

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"The evolution of our model shows undergraduate education is central and graduate education is symbiotic with it,” Dean Gabriele says. “We’ve proven that they can exist together and create a different kind of institution. Its vitality is due in part to the desire of faculty to do research that helps them grow intellectually and produces new knowledge. The result, says Gerard “Jerry” Jones, PhD, ’72 COE, senior associate dean for Graduate Studies and Research, and professor of Mechanical Engineering, is “enhanced personal, professional and institutional reputations, as well as our ability to attract, hire and retain faculty who have trained at top institutions.”

Engineering’s centers of excellence also heighten the College’s research profile and expand its portfolio. For example, the Center for Advanced Communications is making headlines for its use of radar imaging to assist older persons living alone. The Center for Energy Smart Electronic Systems, a National Science Foundation Industry/University Cooperative Research Center, is developing software models that predict energy efficiency in data centers.

GRADUATE AND DOCTORAL GROWTH

The undergraduate powerhouse has spurred the expansion of the College’s graduate education. At the master’s level, the addition of offerings has been strategic and deliberate. The degrees anticipate and respond to market demands: Sustainable Engineering; Cybersecurity; Biochemical Engineering. The programs offer a distinctive experience—students on campus and online participate in the same classes—and this year attracted five international Fulbright grantees.

The most dramatic expression of Villanova Engineering’s evolution has been at the doctoral level. Created in 2003 by then Dean Barry Johnson ’70 COE, the PhD program has 52 students enrolled. Its vitality is due in part to the desire of faculty to do research that helps them grow intellectually and produces new knowledge. The result, says Gerard “Jerry” Jones, PhD, ’72 COE, senior associate dean for Graduate Studies and Research, and professor of Mechanical Engineering, is “enhanced personal, professional and institutional reputations, as well as our ability to attract, hire and retain faculty who have trained at top institutions.”

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CAMPAIGN CREATING NEW HORIZONS

Villanova Engineering Service Learning is another avenue by which students diversify their resumes. The College has built collaborations with communities worldwide. From the development of a robot prototype that will remove land mines in Cambodia, to the design of water supply networks in Nicaragua, engineering students improve the quality of life around the globe. (See Page 29.)

Closer to home, the College has emerged as a leader in creating and supporting science, technology, engineering and math (STEM) outreach programs, all overseen by Stephen Jones, EdD, associate dean for Student and Strategic Programs. By getting middle and high school students excited about these subjects, Villanova students inspire young people to pursue careers that will keep the US globally competitive.

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CAMPAIGN CREATING NEW HORIZONS

E very dream fulfilled becomes the basis for imagining greater possibilities. Committed to its undergraduate mission, the College is reassessing “what a 21st-century engineering education should be so that it aligns with what 21st-century engineers do,” Dean Gabriele says. “We also want to lay a foundation for students to go to in any direction they want.”

Proud that its female undergraduate enrollment is ahead of the national average, the College would like to attract more highly achieving students from all underrepresented groups. Its strategy over the next five years is to double graduate enrollment; award 12 to 15 doctoral degrees each year; and increase annual research expenditures to $5 million. The influx of talented students and faculty will help realize another priority: the launch of a research center in an emerging field.

The College also is excited about creating the Center for Innovation in Engineering Education. It will support and adapt new approaches to teaching and learning; determine best practices for instructional technologies; and serve as a hub for promoting professional development and coordinating service learning.

Campaign gifts will strengthen centers of excellence, and endow directorships, chairs and professorships, adding more faculty all-stars. With the creation of scholarships, research assistantships and graduate fellowships, students will have the financial resources to study engineering at every level.

As the College evolves, it remains true to its origins, identity and destiny. It is becoming more recognizable for what it is and what it stands for. “The evolution of our model shows that undergraduate education is central and graduate education symbiotic with it,” Dean Gabriele says. “We’ve proven that they can exist together and create a different kind of place. These investments allow us to continue to hold a unique position among engineering colleges.”

That’s exactly what the University wants to see in its future. ■