A Master’s of Professional Practice

Throughout the past five years, the College of Engineering’s PhD program has grown at a steady pace to its current enrollment of 43 students. While the College is certainly pleased with the success of the program, Dr. Gerard F. “Jerry” Jones, Senior Associate Dean for Graduate Studies and Research, has noted a side-effect of sorts: “As the PhD program has expanded, courses that were designed for our master’s degree students became increasingly challenging. They started to look like doctoral level courses,” he says.

To attract those seeking an advanced, but more practical master’s degree, Dr. Jones and Dr. Gary Gabriele, Drosdick Endowed Dean, College of Engineering, have decided to refocus the graduate programs to be more appealing and valuable to working professionals. Dr. Jones envisions what the College will call a “Master’s of Professional Practice.” Students will graduate with a Master of Science in Engineering, but the program will offer learning that a practicing engineer can apply immediately.

The College also wants to increase awareness of, and enrollment in, its award-winning distance-education program, which is ideal for the part-time student.

In addition to adjusting the content and methods of teaching, the College of Engineering also is developing new master’s courses and certificates in topic areas where there is strong interest among professional engineers. Among the programs under consideration are:

- Simulation-based engineering
- Biochemical engineering
- Cybersecurity

Dean Gabriele has high hopes for this revamped graduate program. “As the job market becomes increasingly competitive, the importance of a graduate degree cannot be overstated. I want to double our master’s enrollments during the next five years,” he says.

Graduate Students Dedicate Time to Service

Graduate student Daniel Cain CEE ’09 first discovered a passion for international service when he traveled to Peru as a freshman. He later participated in service work in Honduras, and spent more than two years in the Peace Corps after graduation. That experience connected him to former Peace Corps volunteer Jordan Ermilio ME ’08, MSWRE ‘06, Director of Service Learning, and that relationship brought Cain full circle back to Villanova.

Cain is pursuing a Master’s in Sustainable Engineering and will spend one full year of service abroad, taking classes through the distance learning program at the same time. In spring 2013, he will travel to Panama to work with the Panama Canal Authority on issues of resource management and sanitation development. Cain hopes to learn from the Canal Authority’s best practices in this area, and apply them in rural, international development scenarios in Panama and Nicaragua.

Cain’s work demonstrates that service learning is not only for undergraduates. “We are integrating service learning activities into the graduate program because they complement the program’s educational and research goals, and can be a distinguishing feature of a Villanova Engineering graduate degree,” explains Dean Gabriele. He adds, “Service to the community is a core value of Villanova and one that we believe should be a part of every student’s experience in the College—undergraduate and graduate.”

A Commitment to Outreach

The College of Engineering’s nine local, regional and national STEM programs touch more than 650 students from sixth through twelfth grades each year. These programs illustrate Villanova University’s Augustinian Catholic tradition of service and introduce the field of engineering to youth in underserved communities. As baby boomers retire, STEM programs help the College reach the best and brightest; those needed to compete in a global economy regardless of gender or ethnicity.

Briefly, the programs are:

- VESTED (Villanova Engineering, Science, and Technology Enrichment and Development) brings 65 high school students each year, mainly from Philadelphia, to campus for engineering experiences and mentoring on Saturdays. Reports have shown that VESTED provides an understanding of engineering, improves performance in all subjects, and increases college attendance.

- My Engineer (Villanova Engineering, Science, and Technology Enrichment and Development) brings 50 middle school students on campus for four days in the fall and spring each year. The program includes hands-on engineering activities and expands on the concepts taught in VESTED.

- NovaCANE (Villanova Community Action by New Engineers) takes 50 Villanova students to middle and high schools where they conduct experiments and provide teacher education. The students then work on follow-up projects. The classes that participate later experience hands-on activities during a day at the College.

- First Tech Challenge (FTC). Villanova hosts a regional kick-off of this robotics event in the fall and then runs the competition five months later. The event draws more than 300 students. Villanova Engineering students also mentor teachers and students.

The national Leadership Education and Development (LEAD) program prepares academically gifted minority students for engineering and other fields at top universities. Each summer 30 high school students live on campus for three weeks, engage in hands-on experiences, learn about college and visit industry sites.

- VESTED (Villanova Engineering, Science, and Technology Enrichment and Development) brings 65 high school students each year, mainly from Philadelphia, to campus for engineering experiences and mentoring on Saturdays. Reports have shown that VESTED provides an understanding of engineering, improves performance in all subjects, and increases college attendance.

Villanova Engineering dedicates high school teachers to campus to work with faculty on research projects and develop teaching modules for the classroom.

Dr. Dinehart explains the egg drop lesson to the sixth grade structural engineering club at St. Martin of Tours. The club was started by novaCANE.

For more information about the College’s STEM commitment, contact Dr. Stephen Jones, Associate Dean for Student and Strategic Programs at 610-519-5439 or s.jones@villanova.edu.