Rise in engineering enrollment at UConn bodes well for economy

By Michelle M. Murphy

With the hullabaloo surrounding the spanking-new Rentschler Stadium, the always-popular basketball teams, and the general UConn 2000 building boom, it may have been easy to miss the exciting things occurring elsewhere at the University of Connecticut. Yet developments at the School of Engineering over the past five years or so have been at least as important to the state's well-being as the other headline-grabbers — if not more so.

Since the late 1990s, the UConn Engineering School, which observers say has always had a good reputation, has quite literally become bigger and better than ever. And that bodes well for Connecticut's economy, which increasingly relies on technology and innovation produced by highly skilled employees.

"The kinds of jobs that will be available here in Connecticut will require very advanced math and technology skills," says Lauren Weissberg Kaufman, CBIA vice president for education and training policy. "Specialized design, prototype production and batch manufacturing are what we do best here, and it's
what Connecticut is becoming known for. And, with the growth of our fuel cell, pharmaceutical and biotech industries, companies will need to hire science majors, chemistry majors, biomedical majors, electrical and mechanical engineers, and so on.

“The improvements at the engineering school and the increase in the number of graduates really help support these companies,” she continues. “It will help them grow their businesses.”

Some changes obvious, some not

“I think the bonding for UConn 2000 (the 10-year, $1 billion program to upgrade the state university) has made a very large impact on the campus itself—it’s spectacular ... it’s like a small city, with gorgeous, state-of-the-art buildings and dorms,” says Weisberg Kaufman. “But kind of quietly, behind the scenes, UConn has also been doing a lot to upgrade its programs and the kinds of students who come there.”

For example, the School of Engineering has added three cutting-edge facilities, doubled its baccalaureate-degree offerings from six to 12, and attracted exponentially more—and better—students than ever before, bucking a 10-year national trend of declining enrollment in engineering programs.

Stunning physical plant

With the addition of three new buildings, the School of Engineering now has a total of eight, on the Storrs and Mansfield Depot campuses (the latter of which is located on the site of the former Mansfield Training Center in Mansfield Depot). The stopover may well be the Information Technology Engineering Building (ITE), a five-story, 110,000-square-foot structure that was completed in April 2003; it houses the electrical and computer engineering and computer science and engineering departments.

A 16,000-square-foot building on the Mansfield Depot campus is home to the new Connecticut Global Fuel Cell Center, a public/private-sector alliance that conducts cutting-edge research into micro/miniature/portable fuel cells for the U.S. Army as well as a full range of fuel cells for commercial applications. The third new structure is a 20,000-square-foot facility connected to the Homer Babbidge Library, and holds state-of-the-art computer networking, research labs and support offices for the engineering school.

Enhancing the technology offerings even more is a $146 million grant that the engineering school received this past November from EDS of Plano, Texas. The grant, the largest gift in UConn’s history, will provide leading software tools to prepare engineers for

Pathways to engineering and technology education

Companies with employees who want to upgrade their engineering skills or pursue an engineering-related degree should look into the College of Technology Pathway Programs offered through Connecticut community colleges.

The “college” is a curriculum that lets a student begin engineering or technology studies at one of the state’s 12 community colleges and then transfer, without any loss of credits, to a four-year program at Central Connecticut State University, the University of Connecticut, the University of Hartford, the University of New Haven or Charter Oak State College.

Begun in 1995, the program creates “a seamless pathway, with no barriers, for students transitioning from a two-year college to a four-year program,” says Karen Wosczyna-Birch, the College of Technology state coordinator. “In the past, four-year colleges and universities often didn’t accept all of the credits from a two-year school.”

The College of Technology has a lot of adult learners (the average age is 29 or 30), many of whom are already working while going to school at the same time, Wosczyna-Birch says. “In many cases, it’s the only way they can do it. The community colleges are close to home, offer night classes, and are less expensive than a four-year school. So it’s a more affordable way for students to get a degree.”

Two study “pathways” are available: Engineering Science and Technological Studies. “The Technological Studies Pathway is closely aligned with employers,” says Wosczyna-Birch. “We can tailor classes to an employer’s needs.” For example, they’ve created a certificate program (granting credits toward a degree) and a degree program in industrial electronics for a group of manufacturers in northwestern Connecticut. Programs have also been developed for Northeast Utilities and for plastics companies.

The College of Technology has also worked with CBIA on National Science Foundation grant-funded programs, including an externship program for technology educators (see article on Page 15).

If you would like to discuss having courses designed for your employees, contact Karen Wosczyna-Birch at 860-677-8866 or send an e-mail to kwbirch@commnet.edu. “We can be very responsive in a very short time frame,” she promises.

For more information about the pathway programs, visit http://www.commnet.edu/co/academic/cot. For a list of Connecticut colleges and universities offering engineering-related degrees, visit the academic field of study database on the Department of Higher Education’s Web site at http://www.ctdhe.org/database/dherssearch.htm.
Engineering
Continued from Page 3

today’s manufacturing and technology environment, according to UConn officials.

More, and better, students
UConn’s undergraduate engineering enrollment is 58% higher today than it was in 1997 — a very deliberate increase, according to Marty Wood, assistant dean for undergraduate education at the School of Engineering. There are currently 1,400 undergrads (10% of the entire UConn population) and 650 graduate students. And the expansion isn’t over: “We would like to see the number of undergraduates grow to 2,000,” Wood says.

“This is a very positive trend,” says CBIA’s Weisberg Kaufman. “For a long time, the numbers had been going down.”

For an even more dramatic picture, consider the explosion in the size of the freshman class: In 1997, there were 158 engineering freshmen; in September 2003, there were 351 — a 116% jump. What’s more, these students are largely from Connecticut (only about 30% come from out-of-state, with 5% of that number from overseas), and they’re armed with impressive credentials.

“We’ve slowed down the Connecticut brain drain,” says Wood. “We actually increased enrollment without lowering quality. The average SAT score is 1265. In the current freshman class, 10 students were either valedictorian or salutatorian of their high school class; in 1997, there were only six in this category. Among the 17 UConn schools, we have the highest percentage of students in the Honors Program; we’re proud of that,” he continues. “And the engineering school has three of the eight Nutmeg Scholars in the current freshman class.”

Nutmeg Scholars are students who are awarded full four-year scholarships to UConn strictly on the basis of merit. In any given year, depending on the quality of the applicant pool, the university may decide to grant anywhere from one to 10 Nutmeg Scholarships.

What explains this relatively sudden increase in the popularity of the engineering school? One factor, to be sure, is the economy. When a family is strained financially, as many have been during the past four or five years, a college education is much more affordable at a state university than at a private institution.

But there’s more to it than that. “We’ve made more of a concerted effort during the past five years or so to promote our programs and recruit students,” says Wood. “We have a very ambitious dean, Amir Faghi, who’s a very good salesperson and who has put forth several initiatives for undergraduate outreach since he became dean in 1998.”

Getting the word out
The goal, says Wood, is to let Connecticut students, parents and high school teachers know what the engineering school (and engineering careers in general) have to offer. This is accomplished in several ways, including via a highly polished Web site (http://www.engr.uconn.edu), plus brochures and other literature; visits to high schools and middle schools, especially in towns like East Hartford, Willimantic and Bloomfield, which are underrepresented at the engineering school; and on-campus workshops at Storrs for groups ranging from eighth-grade girls to middle- and high-school math, science and technology teachers.

The engineering school also hosts the state-level competition of the annual “Connecticut Invention Convention,” which brings about 3,500 people to Gampel Pavilion to see the creations of schoolchildren from across the state.

Getting people onto the updated campus certainly helps to pique interest in the engineering school, Wood says, but it’s what they discover behind the impressive facades that really draws them in.

For example, in the past two years alone, the school hired 24 new full-time faculty members and four research scientists, boosting the total number of faculty to 117. Among them, there are 17 endowed chairs and named professorships (each endowed chair requires an endowment of $1 million, and each professorship, $500,000 to $750,000). And, about a third of the faculty holds high-level editorial positions on technical journals.

Among the 135 public engineering schools in the United States, the National Science Foundation ranks UConn 26th in terms of external research spending ($24 million), according to university documents.

“These are the things that bring students here,” says Wood. “But we also work hard on retention, on programs that keep the students here once they enroll.” The school has tripled its scholarships, for instance (330 of the 1,400 undergraduate students receive some form of aid, based on achievement). It also offers a host of tutoring and other services to support students in the rigorous academic programs.

Companies are noticing
These efforts are already starting to pay off — both for UConn graduates and for the Connecticut companies that have long been clamoring that they need more people to fill engineering jobs.

“We recruit chemical and some mechanical engineers, both for our location here and also for three facilities near Tempe, Ariz.,” says Harry Kenworthy, vice president of manufacturing for Rogers Corp. in Rogers. “We’ve always recruited from UConn, but also from Arizona State, the Massachusetts Institute of Technology, Rochester Polytechnic Institute, Case Western University and Purdue University. From our perspective, you’re starting to get a higher-caliber, better-quality student from UConn. The gap with other schools is narrower.”
The quality is also apparent to executives from Hamilton Sundstrand, a division of United Technologies Corp. “UConn is a new focus for us,” says Marlin Knight, human resources manager of the Space, Land and Sea business unit at Hamilton Sundstrand. “We recruit from about 25 schools all across the country, and we'd been going to a number of schools some distance from here. We decided to make a commitment to a local school, and UConn was the obvious choice.”

“There were really two drivers for this: the cost of recruitment and our history of retention success,” adds Bob Thoelen, project manager of the spacesuit program in the Space, Land and Sea unit. “Our data would suggest that after three to five years of experience with us, there's a tendency to 'move back home,' set down roots, start a family. That gravity pulls people away from us. So we felt that if we hire people who are from the area, there might be a greater chance that they'd stay with us longer.”

This past fall, they said, was the first time they'd recruited heavily at UConn, interviewing 19 candidates primarily for mechanical and electrical engineering positions. “The quality was good,” says Thoelen. “UConn has historically had a good reputation in the engineering community,” says Knight. “It's always been well thought of. We're familiar with UConn’s tremendous financial investment in infrastructure — the campus is becoming first rate. But they are building on a solid base that was already there.”

“Now, it's a really beautiful, state-of-the-art campus, with improvements in faculty, financial assistance and the requirements to get in. It's attracting both Connecticut and out-of-state students,” says CBIA's Kaufman. “This can't help but benefit the state's economy,” she says. “Connecticut is a high-wage state, and business costs are high. For companies to be able to afford to stay here, to do their R&D here, there must be a steady stream of highly skilled people with the education and training their product lines demand. That's why the improvements at UConn's engineering school are so exciting, and so important to our future.”

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Connecticut colleges produce surge of graduates

Recent enrollment gains fueled a surge of college graduates in Connecticut in 2003. In the second consecutive year of growth, degrees awarded last spring by Connecticut colleges jumped 6.6% to 32,499, the largest annual gain in at least 16 years, according to the state Department of Higher Education. Degrees were up across all levels and in nearly all fields important to the state's economy with the exception of nursing and teacher shortage fields.

Statistics on degrees awarded in 2002-03 are contained in an annual report prepared by the department. The report shows that last spring's total is up 10% from a decade ago. The five most popular fields were business, education, social sciences and history, health professions, and the liberal arts. Fifty-six percent of all degrees were in these fields.

The report also notes that:

• The statewide gain of 6.6% is due largely to a 16% increase in the number of degrees awarded by the University of Connecticut. This also helped boost the public sector's number of degrees by 10%. The public system now produces just under half of all degrees awarded in Connecticut, and might soon award a majority of degrees for the first time since 1997-98.
• In fields important to the state's five key "industry clusters" of bioscience, aerospace, software/information technology, metal manufacturing and maritime, degrees were up 21% in computer science, 12% in engineering and 8% in biology, although the latter two fields continue to lag behind previous peaks (the number of engineering degrees is barely half of what it was in the peak year of 1985). Physical sciences continued its general downward trend, though this year by only 0.5%.
• Degrees across all health fields slipped 0.5%, with nursing down a full 5.3% to just 753, significantly below the Labor Department's projected annual need of 1,235. Over the last five years, nursing degrees have fallen 14%.
• The number of degrees awarded to minority students rose 10.3% but remain over-represented at the two-year level and are not reflective of Connecticut's larger population.
• Women continue to earn the majority of degrees (59%). This is true for every degree level except for doctorates and first-professionals, where they are expected to become the majority in the very near future. (In engineering, however, women earned only 14% of the B.S. degrees granted in 2002-03.)