GENERAL ARTICLES

EDUCATION INNOVATION

NorthBay biz reports on new, green-focused community college programs that offer access to 21st century careers.

Students arriving at California's community colleges this fall are finding crowded campuses and fewer classes outside core transfer areas such as math, science and English. But budget cuts and increased fees at the state's four-year systems are forcing them back to their local community colleges, which themselves are coping with brutal cutbacks.

"We're swamped," confirms Napa Valley College (NVC) President Chris McCarthy. He says increases in fees and limits on enrollment in the California State University system have caused an increase in community college enrollments. "It's an overwhelming surge."

Meet the need

This tidal wave of students comes at the same time community colleges are being forced to drop many elective class offerings—those less popular or essential than the academic basics, which help students transfer to four-year institutions, and vocational training aimed at job placement. At NVC, which has an unrestricted general fund of about $45 million, the state has cut $3.5 million from the current budget with further reductions expected next year. "It's an unfortunate juxtaposition of less money at a time when students need us most," says McCarthy, who, along with the college board of trustees, volunteered for a pay cut this year; "I think it's important that the president goes first," he says.

But budget woes and crowded classrooms aren't keeping NVC and other North Bay community colleges from adding new programs aimed at training workers for 21st century career fields such as solar and geographical technology. And while state government can offer only cuts, the federal administration has money to invest: In July, President Barack Obama announced his "American Graduation Initiative," a $12 million, 10-year plan to raise graduation rates at community colleges nationwide, with the goal of preparing more workers for new-century careers. Obama's initiative for two-year colleges includes grants for job training programs in emerging technology, NVC's McCarthy says, and "our involvement in that effort will really help us be competitive" for the federal money.

McCarthy's key position as chair of the state Economic Development Planning and Advisory Committee—a group of about 20 educators and businesspeople who advise California Community College Chancellor Jack Scott—also helps NVC stay competitive, providing McCarthy with a first-hand look at the latest emerging technologies and the jobs that come with them. "It's given me a better view of the kinds of careers that are evolving, and how we can get ahead of the game in training people," he says.

"There's a lot of interest in training people to diagnose ways of making buildings more energy-efficient," McCarthy continues—a view echoed by Napa-based builder Bob Massaro, CEO of

Healthy Buildings USA, a busy firm that specializes in sustainable design and construction practices. “If you look at the current job market, everybody seems to think most of the opportunities are going to be in renewable energy; I happen to think most of the opportunities are in energy conservation,” Massaro says. “The issue isn’t so much ‘green technology’ as it is high-performance building,” which requires less energy to build and less energy to operate.

“There’s going to be an increase in career opportunities as the construction industry starts to embrace combining high-performance building and renewable energy technologies,” Massaro continues. “This grouping will require workers who are trained in installing different types of materials (like spray foam insulation and triple glazed windows) aimed at making structures as close to energy-neutral as possible. It’s a good time to be training in any of the construction industries.”

Massaro cites new construction at Napa Valley College as a good example of the building practices he’d like to see adopted across the country. “The college has always been at the forefront of implementing new technology,” he says. “The new buildings are a good example: They’re using design techniques like exterior insulation and deep overhangs above the windows to reduce heat from the sun. These are design features we haven’t seen much of in previous generations of college buildings.” The window overhangs are one example of what Massaro calls “passive green technology incorporated into building design. It’s simply another way people are going to be working on high-performance buildings.”

Green building efforts

Like Napa, Santa Rosa Junior College and the College of Marin have also invested in energy-efficient buildings. On the Santa Rosa campus, the Frank P. Doyle Library draws much of its electricity from photovoltaic cells on the roof, for an estimated $20,000 to $30,000 in annual savings. Its air conditioning system makes 350 tons of ice at night—when energy costs are lowest—then circulates water through the ice during the day to chill it before sending it through the building. Recycled materials are everywhere, from the roof and ceiling tiles to the carpets and upholstery fabrics; green and nontoxic building materials were employed wherever possible to reduce outgassing—the emission of unhealthy volatile organic compounds (VOCs) such as cyanide, one of many toxic substances found in traditional building materials like particleboard cabinetry—and the use of nonrenewable petroleum-based resources [See “Knowledge is Power,” Nov. 2006].

In Kentfield, work is underway on College of Marin’s new Fine Arts Building, the campus’s first new construction project since 1973. Funded by the voter-approved Measure C, a $249.5 million bond for facilities modernization and technology that passed by more than 60 percent in 2004, the $13.5 million building is expected to earn at least LEED (Leadership in Energy and Environmental Design) Silver certification from the U.S. Green Building Council. Among the energy saving elements of the new building are an almost 50 percent reduction in water use, due to waterless urinals, dual-flush toilets and ultra low-flow faucets; a combined reflective roof and green (planted) roof system to reduce excess heat within the building; and heating and cooling from the campus’s new geothermal heat exchange system.

Practical applications

On the same campus, College of Marin offers a “skill certificate” in environmental science, which is

meant to give students a starting point for pursuing careers in related areas. The Life and Earth Sciences department (which includes the biology and geology disciplines) offers such courses as "Introduction to Environmental Science," which draws from both natural science and the social sciences to present a general idea of how nature works and how humans and ecosystems are connected; "Environmental Policy and Planning," a study of federal, state and local environmental legislation; and "Soil: Ecology and Management," which includes approaches to using soil sustainably.

The geology department also offers courses with an environmental angle, while the college's Indian Valley campus in Novato has several programs that focus on sustainability, says Nanda Schorske, dean of workforce development and college-community partnerships. Students in traditional trade courses such as auto technology and auto collision repair technology have been working with students in machine metals technology and environmental landscaping to design and build alternative-powered vehicles; while agriculture and horticulture students are learning about sustainable soil and water management practices. A new 2.5-acre organic farm program is also underway at the campus's new Center for Sustainable Horticulture.

"We're supporting the new local economies around sustainability," says Schorske, adding that the new curriculum is a response to industry demands. The campus's first solar installer certificate program class, taught in the fall semester of 2008, was full in 24 hours and had a waiting list of 20 within a week. The program is designed to give incumbent solar technicians the practical skills and support to become photovoltaic panel installers, but it also attracted workers in associated trades such as roofing, construction and electricity. The next semester, a second course was added and it filled just as quickly. "We're always revising the curriculum," Schorske says. "It's a fast-changing technology."

Planning for the future

Napa Valley College has also added a course in solar technology maintenance; other potential areas of job growth [not necessarily courses anytime soon] McCarthy cites are alternative transportation, biotechnology and sustainable development.

The technologies of geographic information systems (GIS) and its better-known sibling global positioning system (GPS) are "huge" areas for job growth, says Richard Della Valle of the college's Department of Geospatial Technology. The satellite-aided technology is essential in developing the environmental studies that are now required for virtually every public or private construction or renovation project. "GIS is *the* planning tool for environmental work," Della Valle says. "It's listed as the President [Obama]'s top two or three as far as job growth; it's the basic tool out in the field."

GIS analysts, specialists, managers and technicians are always in demand, he continues: "They typically work for engineering firms, environmental firms, cities and counties," where GIS and GPS have become essential tools for urban planning. "You get paid more as a geologist for learning urban geology," Della Valle says, explaining that, beneath the streets and sidewalks of any modern city, there's an underground infrastructure of water, sewer, energy and communication systems that must be programmed and monitored digitally. Firefighters and other first responders use the technology, too, and "You can't effectively do homeland security without GIS and GPS," Della Valle adds. It can be used for planning evacuation routes, mapping and analyzing the incidence of crimes and other security tasks. Della Valle says his students get very excited when they realize all the applications and job possibilities that come with GIS and GPS training.

Geographical technology is also used by grape growers who practice what's called "precision viticulture," in which vineyard managers use GIS to target their cultivation efforts block by block—even row by row—depending on soil composition, microclimate and terrain. "Now you can target your [chemical] spraying, to avoid overspraying," Della Valle explains. "This impacts the groundwater, impacts the fish and ultimately impacts people, because people are at the top of the food chain."

SRJC has added a GIS certificate that consists of a two-year program culminating in a certificate for geospatial technology—or students can major in geospatial technology on their way to a degree from a four-year school. Other SRJC offerings with an emphasis on the environment include certificates in natural resources management and in watershed management.

While pleased that community colleges are incorporating energy efficiency practices in their infrastructure and environmental issues in their academic programs, Napa builder Massaro is still looking for more vocational classes aimed at training workers to build high-performance structures, like the SRJC library and Kentfield art center, which use less energy to both construct and operate.

"I'd like to see a program that takes construction workers through a complete overview of sustainable building practices, so they understand how all the pieces fit together," Massaro explains. "When we start a project, we bring all the subcontractors together and we have an orientation session on what the goals of the project are, what we hope to achieve in energy savings and how their trade helps to reach these goals."

If more community colleges can create a similar curriculum, he believes, more people involved in the construction industry—workers and firms alike—will be equipped to take part in energy-saving projects, which not only will conserve resources but will help stave off catastrophic climate change. "I find that our subcontractors like working with us," Massaro says. "They learn about technologies they know they need to learn, because the building industry is moving that way."