

## Features

▶ Archived Issues

 print this page | 
  e-mail this page | 
  subscribe

## Feature - March/April 2005

### Integrated Project Delivery Takes Some Special Skills

By Elaine Silver

A quiet revolution now is taking place on the idyllic campus of California Polytechnic State University (Cal-Poly), San Luis Obispo. Engineering, architecture, construction management and business undergraduates are all coming together in three interdisciplinary courses to build virtual projects, learn about alternative delivery systems and explore design-build project management. Called integrated



services classes they facilitate project teamwork and develop student presentation, planning and negotiation skills. The courses are the only ones found in an undergraduate program and may well serve as a model for other schools seeking to break the silo thinking of professional education.

The Construction Management Dept. hosts the Integrated Project Services effort, which consists of three design-build courses now enrolling 75 to 95 students annually. But building this modest interdisciplinary curriculum has been a major feat of re-engineering, challenging the prejudices faculty members had about design-build. The effort has been worth it, says the program's originator, Barbara Jackson, an assistant professor in the CM Dept., which is a division of the College of Architecture and Environmental Design.

When Jackson began teaching at Cal-Poly in 1998, there was one course called Project Delivery and design-build was mentioned briefly. Jackson thought there was a need for a dedicated design-build course but she encountered a lot of resistance when she raised the idea. The resistance mirrored industry professionals' reluctance to embrace design-build at the time.

"One faculty member said, 'Why would you want to design a course around one delivery method?'" Jackson says. "I said, 'Well you already have a whole curriculum designed around one delivery method, design-bid-build.'" And with that, Jackson set out to educate the educators as well as students. "We continue to try to remove the roadblocks that prevent students from having access to this education and we have made a giant first step by offering this curriculum," says Jackson.

Now there is growing support on campus for the program. The former interim head of the School of Architecture, Margo McDonald, is a proponent of the integrated curriculum. "This is a great complement to design education," she says, "And we need to find other ways to work together."

#### Can-Do Spirit

#### Sponsors

McGraw\_Hill  
CONSTRUCTION

professional  
bookstore

WAR  
on  
TERROR  
McGraw\_Hill  
CONSTRUCTION

Jackson approaches design-build teaching with zeal. "These are our next generation of architecture-engineering-construction professionals," she says. "We need to influence them at the university level."

Jackson left a 20-year career as a contractor in Virginia because she says conflicts between the construction players took the fun out of building. She went back to school and received a Ph.D. degree in education and human resources from Colorado State University, where she also had received a B.S. degree in housing and design/construction management and a M.S. in CM. In addition to guiding future design-builders, Jackson frequently is hired to teach AEC professionals how to become design-builders. She currently is teaching integrated services to a joint venture of DMJM and 3DI—the team working on the design side of the Pentagon renovation.

The Cal-Poly program's centerpiece is a course called Integrated Project Services—CM 431 (see p. 25). Jackson says she could not call it a design-build course because "the architecture department had a problem with us using the word design in a non-architecture course."

But sensitivities aside, a lot has happened in the seven years since Jackson began her quest. Starting in the fall of 2003, Cal-Poly students have had the opportunity to take three design-build courses. All CM students are required to take CM 431 as a requirement for their major. The two other courses are taken as electives or as a requirement of the student's minor.

If students have design-build as a minor, they also have to sample other disciplines. For example, a CM major must take nine units in design, and architecture students have to take nine units in the CM Dept. in addition to the design-build courses.

C. Nicholas Watry, an architect and engineer, is working with Jackson in her collaborative efforts. He holds the George Hasslein Interdisciplinary Chair, funded by alumni, and is founder of Watry Design Inc., Redwood City.

Watry co-teaches the Integrated Project Delivery class with Jackson and believes that tapping the industry for expertise is essential to the program. "My advice to colleagues in other universities is to go to the practitioners for help," he says. To encourage outreach, Watry and Jackson hope to develop a syllabus that can be transferred to other programs.



But just offering the courses does not ensure success. The professors believe the make-up of the class should reflect the workplace mix of specialties that come together in design-build project delivery. Jackson and Watry have to "sell" the course to engineering and architecture students, as well as their faculty.

Having a design-build class comprised only of CM students would have limited value, at best, especially since these classes are hands-on team learning experiences, say the professors. "Optimally, we would like to have eight CM majors, four architecture majors and four engineering majors in each class," says Jackson. In the Integrated Project Management class, three teams comprised of a mix of professions tackle a real project and act as the design-build team assigned to execute the project.

Obtaining the desired mix of students recently was made much easier when the

*Classes include graphic illustrations and hands-on work that stress the differences in design-build to other project delivery systems.*

architecture department started offering the Integrated Project Services course as a studio elective for upperclassmen. Ironically, this change did not take place solely due to a shift of ideology. The

architecture school did not have space in its studio classes for all its students, so offering the design-build course as a design studio solved a space problem.

The professors are also addressing perception problems. Lisa Volpe is pursuing a double major in CM and architecture and is part of Cal-Poly's Design Build Institute of America student chapter. Volpe did not know anything about design-build when she began her studies and she's been surprised at what she's discovered.

Volpe has taken the Integrated Project Delivery class twice. "The first time I took the class, our assignment was to design a new math and science building on campus," she says. "All these people can come together and make a great design and great structure and put aside egos. The end product is much better because we had the input of all these different majors."



*Bridging different professions to form a project team is the cornerstone of successful delivery. (Photo courtesy of Cal Poly)*

Matt Dalberg was well into his fourth year as an architecture undergrad when he realized that something was missing from his education. He started taking CM classes and found Integrated Project Services. After his first design-build class, Dalberg was hooked. He went on to take the Integrated Project Management class. "Every week, a different firm came in and presented a project. I could see how the different companies like Clark Construction and Caltrans do design-build," Dalberg says. He says that he had been criticized in his architecture classes for being too practical in his approach. "This [design-build] is something I did not know existed until I took the class," he says. Dalberg, who graduated in June 2004, now is a six-month veteran of the Haskell Co., a Jacksonville, Fla.-based design-build firm. "I solve different problems daily by running next door and talking to the architect and engineer," he says.

"It's great to leave Cal-Poly with real-world experience," says Jordan Moffet, an architecture student and CM minor who now is in partnership with Levi Seligman, a CM graduate he met in the design-build class. The two are restoring a historic home in San Luis Obispo. "Every time we get together," Moffet says, "We design together like we were taught in class."

It is not just the students who are surprised by what they find in the classroom. Tim Reed is redeveloping an abandoned amphitheater in suburban San Luis Obispo and his project served as material for the Integrated Project Services course in late 2004. "Sixteen students all did an A-to-Z approach, from design to costing and scheduling. They met with stakeholders and did site walks," he explains. "They've given me a wonderful set of tools I can move forward with. There were some really good ideas."

The students suggested a tensile fabric roof structure and suggested using an advanced kind of "Astroturf" to solve the problem of water usage. This problem is particularly significant because the theatre is in a drought area. But most importantly, says Reed, "It is critical to do this project design-build. It is a wonderful way to build consensus and get the project approved."

The future looks bright for Cal-Poly's design-build curriculum. Through the CM Dept. and with the corporate sponsorship of The Olson Co., Seal Beach, Calif., a 2,000-sq-ft Integrated Project Services Laboratory will be built for interdisciplinary work. Jackson hopes to create a more comprehensive integrated project delivery minor with 30 units, open to all students.



*Cal Poly built an award winning program that educates and encourages interdisciplinary work. (Photo courtesy of Cal Poly)*

The teamwork also is starting to produce awards. Cal-Poly's design-build team recently placed second in a regional competition sponsored by the Associated Schools of Construction, working on a \$5- million administrative office building at Los Alamos National Lab in New Mexico. The Cal-Poly team has placed first or second every year since the design-build category was added seven years ago.

The new dean of the College of Architecture and Environmental Design, R. Thomas Jones, thinks Cal-Poly is in a unique position to create

exciting interdisciplinary classes. "There is a legacy at the college of the different majors studying together," he says. "And now the biggest demand for electives is in interdisciplinary classes. Barb [and the design-build curriculum] is the beginning of a wave."

[Click here for features archives >>](#)



print this page |  e-mail this page | [subscribe](#)

[terms of use](#)

[privacy policy](#)

[advertise](#)

[about us](#)

[site map](#)

[Our Sites](#)

[McGraw-Hill Sites](#)