

125 YEARS AT THE EDGE IN KNOWLEDGE:

A new degree program continues the NJIT tradition of meeting industrial needs

Concrete Solutions for Construction



The Romans built with concrete more than two thousand years ago, even using a mixture that hardens underwater. In the 21st century, concrete is the most widely used construction material in the world. Exceptionally strong and corrosion resistant, it is preferred over steel and wood in many parts of the globe. Today, concrete is a high-tech product precisely formulated for environmental conditions and applications spanning the full spectrum of infrastructure, commercial and residential projects. Concrete is one of the oldest building materials as well as one of the newest.

In the United States alone, the \$100 billion-dollar concrete industry employs a half-million people. It is also a dynamic industry that needs a growing cadre of professionals with special expertise. That's why Newark College of Engineering and the Department of Engineering Technology have launched the BS degree program in concrete industry management technology (CIMT) that enrolled its first students this fall.

A model partnership

"In many respects, our new CIMT program is a model partnership between industry and academia," says Professor John Schuring, interim dean of NCE. "All those involved are contributing their respective skills to ensure the prosperity of a vital U.S. industry." The economic significance of this initiative is also underscored by financial support from the industry — support that includes a million-dollar gift for NJIT.

The genesis of NJIT's CIMT program was in the 1990s. That's when pioneering industry executives formed grassroots Concrete Industry Management (CIM)

Patrons groups and a National Steering Committee (NSC) to build on the success of CIM courses at Middle Tennessee State University. With the support of firms that supply all types of concrete and concrete products, along with contractors, educators, trade associations and other organizations, the NSC has implemented a strategy of developing regional programs at select universities. Financial impetus for this effort came from the National Science Foundation in the form of a \$600,000 grant. These combined resources have seeded programs at Arizona State University and California State University, as well as at NJIT.

While pre-cast concrete products are a key part of the industry, the familiar sight of mixing trucks delivering concrete indicates how the industry also has a unique local character. According to Michael Gentoso, who is affiliated with a CIM Patrons group in New Jersey, the NSC's regional approach has been shaped by this aspect of the business. In addition to his CIM advocacy, Gentoso is president and general manager of Eastern Concrete Materials, Inc., and president of the New Jersey Concrete and Aggregate Association.

As Gentoso explains, ready-mix concrete must be prepared shortly before use. Typically, there is a window of two hours or less between the start of the mixing process and pouring in place. Local variables must also be taken into account when preparing concrete, such as weather conditions, specific project requirements, and even variations in the basic constituents.

"CIM education is the future of our industry," says Eugene Martineau, NSC chair and CEO and president of U.S. Concrete, Inc. "It's essential for meeting the

the Industry



technical challenges of using concrete as a building material and for providing the business skills that companies must have to grow.”

Martineau says that the demand for grads is already far greater than the number available, and that NJIT is an ideal focal point for a program in the Mid-Atlantic region. “In addition to location, the university serves students inclined to consider careers in our field, and NJIT’s faculty and administration are very enthusiastic about providing this opportunity. We considered several other schools but found the best match at NJIT.”

The complexities of concrete

In some respects, the recipe for concrete has not changed over the millennia. It still consists of dry cement, mineral aggregates like gravel and sand, and water. Over the past few decades, however, the economics and technology of concrete have become more complex. Concrete is now formulated with a sophisticated array of additives, including polymers, synthetic fibers and pozzolans. These determine strength, appearance and other physical characteristics, as well as allowing for control of setting and curing times. For example, ultra-high strength concretes (greater than 20,000 psi) have come into recent use for high-rise and security-protective structures.

“Consider the knowledge and skills that the industry demands and which our CIMT program will provide,” says Professor Robert English, chair of the Department of Engineering Technology. “Young men or women embarking on careers in the field must be knowledgeable about the science of concrete and be familiar with construction techniques and construction manage-

ment. They also need a solid background in finance, marketing and law, and it’s essential that they be good communicators. Our graduates will be well prepared to work in many areas of the industry.”

In addition to providing scholarships and internships, the industry will collaborate with NJIT on research. The university has long been engaged in materials-science research, including the evolution of concrete as a highly engineered building material. The CIMT program will draw extensively on these capabilities. Experts from the industry will also collaborate on curriculum development, and serve as adjunct faculty and guest lecturers. Students will be required to complete at least one internship as they progress toward their degrees.

“All CIMT courses will emphasize problem solving, quality assurance and customer satisfaction,” English says. “Practical case studies and industry internships will help to ensure that students have the real-world background they need to be successful in an industry where their skills will be in great demand. It’s also an industry where jobs can’t be sent offshore. You can’t manufacture the concrete for a local construction project and mix it in another country. That’s a big plus these days.” ■

For more information about NJIT’s CIMT program, contact Professor James Brown, James.Brown@njit.edu or 973-596-3328. Also visit NJIT on the Web at www.njit.edu.

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