

STAFF DEVELOPMENT

Proposed Master of Civil Engineering Professional Degree

Most Louisiana Department of Transportation and Development (DOTD) engineers have degrees in civil engineering, but few pursue advanced degrees. These engineers recognize that additional training in specialty areas of transportation would improve their technical skills and make them more valuable as employees, but few are willing to commit to a two-year, research-oriented MS degree. To counter this situation, the Louisiana DOTD is working with six universities to develop a one-year Master of Civil Engineering Professional Degree. The program is designed to provide DOTD engineers—and their private sector counterparts—more in-depth knowledge in selected specialty areas within civil engineering. The current timetable anticipates that the first students could enter the program in fall 2002.

Engineering a More Professional Work Force

Dr. Kam Movassaghi was appointed Secretary of the Louisiana Department of Transportation and Development (DOTD) in 1998. A former academic, the Secretary noticed the lack of advanced degrees among the DOTD's professional engineering staff. He also discovered that many DOTD engineers knew the value of higher education to increase their competency in specialty areas. The Department offers a tuition-reimbursement policy, but many engineers are reluctant to pursue higher degrees because current graduate programs usually focus on research rather than a professional orientation.

“Coming from a research-oriented institution to the practice-oriented profession that is the DOTD, I sympathized with the need for additional training, and with the inability to find it,” says Dr. Movassaghi. “I began to talk with several university deans about our situation and how we might improve it. The universities obviously have the technical expertise,” he continued, “we just had to find a way to give our engineers access to it. I emphasized that we had an opportunity that would benefit us both—the DOTD gets better trained engineers and schools enroll more students.”

Dr. Movassaghi directed the DOTD to explore the need to improve technical expertise and the possibility of making higher education opportunities available to the

Universities scheduled to offer the Master of Civil Engineering Professional Degree

College of Engineering
Louisiana State University and
Agricultural and Mechanical College
Baton Rouge

College of Engineering
Southern University and Agricultural
and Mechanical College, Baton Rouge

College of Engineering
University of New Orleans

College of Engineering
University of Louisiana, Lafayette

College of Engineering and Science
Louisiana Tech, Ruston

School of Engineering
Tulane University, New Orleans



Department's engineering staff. The Secretary commissioned Kirt Clement, Associate Director for Technology Transfer at the Louisiana Transportation Research Center (LTRC) and then LSU Professor Dr. Peter Stopher to chair the effort. Kirk Clement and Dr. Stopher convened a "forming session" in March 2000. Invitees included deans of engineering schools and colleges, graduate school deans, and chairs of civil engineering programs from the six Louisiana universities that offer degrees in civil and civil and environmental engineering. The session also included selected DOTD employees who had earned advanced degrees. Attendees embraced the concept of a cooperative degree program and accepted the challenge to develop it. A Collaborative Task Group (CTG) was formed and charged with the responsibility of bringing the degree program to reality.

Universities participating in the degree program are Louisiana State University and Southern University in Baton Rouge, Louisiana Tech in Ruston, the University of New Orleans, the University of Louisiana at Lafayette, and Tulane University in New Orleans.

The CTG drafted a Letter of Intent proposing the new program, which was circulated to participating universities in March 2001. Once the letter is signed, it will be submitted to the State Board of Regents for approval. Once approved, a full proposal outlining program development, funding levels and

resources, demographics supporting the need, and university participation criteria will be developed. The anticipated proposal submission is September 2001. If the program remains on its tentative schedule, the first class of students will be admitted in fall 2002.

A Degree of Cooperation

The Masters of Civil Engineering Degree is proposed as a one-year, 30-credit-hour course of study that provides in-depth knowledge in selected specialty areas in civil engineering. Twenty-four credits will comprise formal course work, while a 6-credit hour practicum replaces the traditional research and thesis requirements. The degree is intended to be a calendar-year program, with entry in the fall semester and concluding with the practicum the following summer.

Dr. Movassaghi envisions a single program that is offered at each university. "The degree program will only work if the schools agree to a common curriculum," he says. "All the credits should transfer among the universities so that employees relocating to positions around the state can simply move their credits with them and continue their studies in the new area."

The participating universities provide the necessary geographic diversity to meet the needs of eligible professionals. Students will apply for admission to the program at the university nearest them. A major attraction of the

program for the universities is the potential to increase enrollment in the civil engineering schools. Dr. John Metcalf, LSU College of Engineering, who replaced Dr. Stopher as co-chair of the CTG after Dr. Stopher left LSU for the University of Sydney, is managing the negotiations with each university and working with deans to ensure compatible requirements among the courses.

Dr. Metcalf sees this new program as a complement to the existing graduate engineering curriculum and degree programs. "The core of this program is sharing technical expertise and information. I see it as an opportunity to increase enrollment in the university as well as further developing the professional skills of our engineers and our students," he observes. "It benefits the state and the university."

The inventiveness of the degree program is that it requires no new curriculum development, rather it has the advantage of drawing on existing course curricula among the participating schools. The program includes existing 4000- and 5000-level courses—with the possibility that some may be offered at the 7000 level to conform with the Louisiana State University (LSU) system and corresponding levels at the other universities. LSU provides a convenient model for the program because the LTRC, a joint venture between DOTD and LSU, is located at the university and the LTRC director serves as a gratis faculty position with the LSU College of Engineering. Some modification

to several courses will be necessary to adapt them to distance-learning techniques.

The object of the program is to give students the convenience of comparable courses at each university. According to Dr. Metcalf, “The department chairs of the universities agree with the intent of the degree program, and we’re now working with the faculty to build consensus for the technical content offered. Once the Letter of Intent is signed, we can begin the serious work of ensuring agreement among the courses offered.”

Student Matters

As noted, students will apply to the university program nearest them. Admission to the program will be on the basis of proven undergraduate performance and, for professionals already working in the field, possible practical experience since graduation.

Once admitted, a Student Advisory Committee (SAC) is formed to guide each student through the program. Each SAC will include three members, two from the Civil Engineering Department at the university where the student is registered. The third member will represent the agency offering the practicum experience. The SAC will play an important role in developing the students’ study courses. For example, students who bring several years of experience to the program can petition the SAC to count that experience as fulfilling the practicum requirements. For students pursuing this option, the third SAC member will be a supervisor or other individual

familiar with the student’s professional expertise in the practical area.

The SAC also has the option to approve the transfer of up to 6 credit hours from a nonparticipating university. They may also approve the transfer of 6 credit hours of nonmatriculating course work. Students may also transfer from a Master of Science in Civil Engineering program at any of the participating universities and receive full credit for those

courses toward the core requirements and electives of the professional degree.

At the completion of the program, students will be required to write a report from the practicum experience and pass an oral examination by the SAC, which will also focus primarily on the practicum experience.

In addition to course work on the campus where they are registered, students will have the opportunity to take additional

Curriculum Requirements

The proposed Master of Civil Engineering Professional Degree Program curriculum requirements are:

- A minimum 30-credit hour program.
- Admission is on the basis of adequate undergraduate performance; there is no graduate entrance examination required.
- The one-year program begins in the fall semester and concludes with a practicum the following summer.
- 24 credit hours of formal course work are required before undertaking a 6-credit practicum.
- A three-member Student Advisory Committee (SAC) oversees each student’s work. The SAC will include three members, two of whom must be from the Civil Engineering Department at the university where the student is registered. The third member will be a representative of the agency offering the practicum experience.
- The program is designed for students with undergraduate degrees from accredited schools of civil engineering. Students may transfer up to 6 credit hours from a nonparticipating university or count practical experience since graduation with approval of the SAC.

courses offered at other universities through the Louisiana university system's and DOTD's distance-learning capability. An example cited by Kirt Clement would be a specific course in the structures area, such as pre-stressed concrete technology. "If only Louisiana Tech offers it," he notes, "then that's the distance-learning course to be offered." He also sees the potential that engineers from a district enrolled in a distance-learning course would use one of the DOTD district offices as the classroom.

Private Sector Agreement

An additional incentive for a professional degree program comes from the private sector. There is strong interest in the engineering profession to move toward formal requirements for continuing professional development opportunities. The American Society of Civil Engineers (ASCE) has endorsed the idea of a Master's degree as the first professional degree for the practice of Civil Engineering. ASCE has also indicated that a fifth-year program (one year beyond the undergraduate degree) could be a desirable requirement for professional registration.

The profession and Boards of Registration have yet to adopt these requirements, but the endorsement clearly indicates concern about the need for more education and training beyond the undergraduate level.

Kirt Clement sees the private sector as a major participant in the new degree program. "Our target audience is the

transportation community," he notes, "and we see that consultants and contractors may also promote other professional area degrees. This can only serve to strengthen the technical expertise in transportation, which is a positive for our community."

A Journey at Midpoint

Both the DOTD and the universities are optimistic about the benefits of instituting the new graduate program. The Devil is, of course, in the details. For example:

- The (DOTD) has a tuition reimbursement policy, but should the Department assume some or all of the cost of a degree program? Options being considered include paid time off to attend classes—much like a barter system—or reimbursement of a specific number of classes.
- What incentives will keep DOTD engineers with the Department once they complete the degree? Kirt Clement anticipates some type of contract agreement that graduates will stay with the Department for a specified amount of time, possibly linked to the amount of financial support received. Perhaps there will be a bonus for completion either as a lump sum or as a percentage of a lump sum over a certain period.
- How will the Department handle its daily work loads while some of its engineers take advantage of the program?

Dr. Movassaghi sees tremendous opportunity with the degree program. "It's a way to motivate our engineers to stay abreast of technical developments," he asserts. "It's also a way for our employees to feel better about their own expertise and our Department."

While there are issues yet to be resolved, Kirt Clement and John Metcalf are optimistic about the establishment of the program. "The way I see it, the new program is a way for DOTD employees to improve their technical skills," notes Mr. Clement, "which improves the Department's ability to serve the public better. It's in our interest to provide the opportunity for our engineers, and it's our obligation to ensure the they stay with us so that we reap the benefits of their professional expertise."

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