February 26, 2020

TO: Members of the Board of Trustees
FROM: John A. Elliott, Ph.D., Provost and Executive Vice President for Academic Affairs
RE: Graduate Certificate in Bridge Engineering

RECOMMENDATION:

That the Board of Trustees approve a new Graduate Certificate in Bridge Engineering.

BACKGROUND:

The condition of highway infrastructure in the United States has been deteriorating for years. Bridges are some of the most critical links in our transportation network and many require substantial repairs or replacement. As the nation is tasked with maintaining and replacing bridges in the coming decades, a trained workforce with competency in bridge design and evaluation is required.

Currently, most students that graduate with a bachelor’s degree in civil engineering do not have a background in bridge design. Furthermore, while there are many masters programs for structural engineering, very few specialize in bridge engineering. Students may also be deterred from a traditional master’s program due to the general required courses, cost, or time commitment.

There is a critical need to fill this gap in education by providing specific courses that are relevant to practicing bridge engineers, and a formal means to recognize the completion of such courses. The proposed certificate program was developed based on input from practicing engineers on the applied knowledge they would like their employees to have. As there are very few programs of this sort, it is necessary to provide this option for students both in Connecticut and nationwide.

This program will be entirely online and offered in the Department of Civil and Environmental Engineering within the School of Engineering. It is anticipated that once the program is established 20 students each year will complete the certificate.
Request for New UConn Academic Degree Program

General Information
Name of degree program: Graduate Certificate in Bridge Engineering
Name of sponsoring Department: Civil and Environmental Engineering
Name of sponsoring College: School of Engineering
Campuses: Program Entirely Online
Contact persons: Kylene Perras
Type of Proposal: New
Type of Program: Graduate Certificate
Anticipated Initiation Date: Fall 2020
Anticipated Date of First Graduation: Dec 2021
Entrepreneurial program, approved by Provost’s Office: Yes
Tuition for the program approved by Provost’s Office: Fee-based
CIP Code: 15.0201 (Civil Engineering Technologies/Technicians)

Justification for the New Program
The condition of highway infrastructure in the United States has been deteriorating for years. Bridges are some of the most critical links in our transportation network and many require substantial repairs or replacement. As the nation is tasked with maintaining and replacing bridges in the coming decades, a trained workforce with competency in bridge design and evaluation is required.

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Are there similar programs in CT or elsewhere?
There are no similar programs in CT. The University of Buffalo offers a certificate in Bridge Engineering.
What are the desired learning outcomes of the program?
- At the conclusion of the program students will:
- Gain a well-rounded understanding of the fundamentals of bridge engineering
- Learn how to apply the technologies and methodologies for Accelerated Bridge Construction to typical bridges
- Understand the importance, need for and processes for load rating of bridges
- Learn how to design bridges for the various extreme events experienced

Program Description
Our aging infrastructure includes hundreds of thousands of bridges. Many of these bridges were built during the 1950s and 1960s. They are fast reaching the end of their service life, which represents a large wave of future engineering challenges. Many studies have indicated a growing need for bridge engineers to rise to this challenge. The Certificate in Bridge Engineering provides students with a background in the fundamentals of bridge structures. This program is focused on practicing engineers and covers content not commonly included in structural engineering graduate programs. This four-course program will train the engineering workforce on the design, construction, and evaluation of bridge structures. This will include courses on bridge design, accelerated bridge construction, designing bridges for extreme events, and load rating bridges. Certificate holders will be well qualified for bridge engineering positions with state departments of transportation or private industry.

Proposed Graduate Catalogue Copy
The Civil and Environmental Engineering Department offers a 12-credit certificate program to train engineers on the design, construction and evaluation of bridge structures. The certificate program builds competency in bridge design, accelerated bridge construction, design related to extreme events, and bridge load ratings.

Required Courses: CE 5380, CE 5384, CE 5383 and CE 5382.

The certificate is offered by the School of Engineering.

Faculty Involvement
Dr. Arash E. Zaghi, Dr. Alexandra Hain, Mr. Michael Culmo, Dr. Masoud Mehraraoui

Enrollment and graduate projections
Initially 10 students are anticipated to enter the program with a date of completion of December 2021. Moving forward it is anticipated that 20 students will be granted a certificate each year.
Program Evaluation
Overall enrollment, the performance of students in the course, surveys to receive student feedback, as well as information provided by these students that are working professionals about their employment will be used to continually assess the needs and value proposition for each student. Program administrators and directors will review all of these items to make ongoing assessments about the certificate and to discuss options for future improvements.

Program Administration
The program will be overseen collectively by the Civil Engineering Department and the School of Engineering’s Professional Education (PE) program.

Funding and Financial Resources Needed
The students enrolled in the courses will be sponsored by their employees or will self-pay. No additional financial resources are needed for the program.

Internal and external applicants can apply to this program.

Anticipated term and year of first enrollment
Spring 2020

Admission Requirements
Typical applicant will have the following qualifications:

Baccalaureate (B.S.) degree from an accredited institution in an approved discipline
If your baccalaureate degree is not within engineering, please contact the PE office for further assessment

Cumulative GPA of 3.0 or better for the entire undergraduate record or for the last two years
Four semesters of Calculus

Applicants must also satisfy all the Graduate School admission requirements. The Advanced Engineering Certificate programs do NOT require GRE for admission, however students have the option to send scores if they have taken the examination.

Required for application:
- Personal Statement
- One Letter of Recommendation
- Research Statement
Term(s) to which students will be admitted

- Fall
- Spring

Rolling application deadline.

Initiator
Kylene Perras, kylene.perras@uconn.edu, 860-486-0870

Program Director Name
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