GEORGE MASON UNIVERSITY
Graduate Council NEW Certificate, Concentration, Track or Degree Program
Coordination/Approval Form
(Please complete this form and attach any related materials. Forward it as an email attachment to the Secretary of the Graduate Council. A printed copy of the form with signatures should be brought to the Graduate Council Meeting. If no coordination with other units is required, simply indicate “None” on the form.

Title of Program/Certificate, etc: Graduate Certificate in Civil Infrastructure and Security Engineering

Level (Masters/Ph.D.): Masters

Please Indicate: ______ Program ____X__ Certificate _______ Concentration _____ Track

Description of certificate, concentration or degree program:
Please attach a description of the new certificate or concentration. Attach Course Inventory Forms for each new or modified course included in the program. For new degree programs, please attach the SCHEV Program Proposal submission.

Please list the contact person for this new certificate, concentration, track or program for incoming students:
Dr. Michael Bronzini

Approval from other units:

Please list those units outside of your own who may be affected by this new program. Each of these units must approve this change prior to its being submitted to the Graduate Council for approval.

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Submitted by: _____________________________________________ Email: ____________

Graduate Council approval: ________________________________ Date: _____________

Graduate Council representative: __________________________ Date: _____________

Provost Office representative: ____________________________ Date: _____________
The graduate certificate in Civil Infrastructure and Security Engineering is a professional program that is appropriate for civil infrastructure (transportation, water and wastewater, utilities, etc.) owners and operators, designers, planners, maintenance staff, and other technical workers within the public and private sectors, who are responsible for improving facility and equipment performance, reliability, security, efficiency, and management practices.

New approaches to civil infrastructure problems are emerging that use traditional civil engineering domain knowledge, in the context of information technology with a systems approach, to analyze the complexity of and interaction among various infrastructure components and their performance. Currently, the most important challenge of infrastructure engineering is to improve the quality of stewardship, which falls far short of public expectations, and to improve immediately the security of critical civil infrastructure. The Civil Infrastructure and Security Engineering Certificate is intended to respond uniquely to the need for broad training in the holistic/systems approach to the long-term management of infrastructure, with specific attention to risk and vulnerability assessments, and to creative solutions to providing improved system security. The certificate program is flexible and can be tailored to the needs of students within the infrastructure engineering community, but is also intended to be responsive to the needs of infrastructure owners, operators, and other technical staff.

Admission Requirements

Potential candidates should have a bachelor’s degree in Engineering, Architecture, Mathematics, Science, or other related technical field, and must also be computer literate. Candidates should inquire with the certificate coordinator for details of program planning. Courses are offered in late afternoon and evening and are particularly suitable for part-time students.

Certificate Requirements

The certificate program consists of 15 credits (five courses), selected from certificate program courses and elective courses. The certificate courses are aimed at building the foundations of asset management methods based on a holistic/systems approach. The certificate program courses consist of:

- One core course, CEIE 680, Introduction to Infrastructure and Security Engineering (3 credits)
- A minimum of two of the following specific sector courses:
  - CEIE 681 Security of Structural Systems (3 credits)
  - CEIE 683 Water and Wastewater Systems Security (3 credits)
  - CEIE 686 Transportation System Security and Safety (3 credits)

The remaining elective credits must be selected from the following course listing:

- CEIE 510 Geographical Information Systems in Engineering
- CEIE 511 Design and Inventive Engineering
- CEIE 670 Civil Engineering Decision Methods and Tools
- CEIE 671 Best Engineering Management Practices
• CEIE 685 Civil Engineering Information Management
• CEIE 690 Special Topics (depends on the topic; requires coordinator approval)
• PUBP 710 Pricing, Management, and Privatization of Public Assets
• PUAD 640 Public Policy Process
• PUAD 661 Public Budgeting Systems

Selection of courses is subject to the approval of the certificate coordinator to ensure cohesiveness and compatibility. Some courses may have prerequisites for which the student must qualify or seek a waiver from the appropriate instructor. A cumulative GPA of 3.000 is required, and no more than one course with a grade of C may be applied toward the certificate.

M.S. in Civil and Infrastructure Engineering

To earn the M.S. degree, with a specialization in infrastructure management, students would complete an additional 12 credits of course work, a 3-credit project, and a minimum of 10 graduate seminars approved by the CEIE department for the degree program.

Contact: George Mason University
Dept. of Civil, Environmental & Infrastructure Engineering
Attention: Dr. Michael Bronzini
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