



## Volgenau School of Engineering

# CIVIL & INFRASTRUCTURE ENGINEERING, B.S. 2017 - 2018

The George Mason University Sid and Reva Dewberry Department of Civil, Environmental, and Infrastructure Engineering (CEIE) offers a Bachelor of Science in Civil and Infrastructure Engineering (CIE) that prepares graduates to practice across the spectrum of civil engineering. Our degree program provides the skills needed to identify solutions that address the most pressing civil infrastructure needs of our built environment. These include: transportation, water resources, environment, structural, geotechnical, construction engineering, and land development. The curriculum focuses on educating students not only in the science and application of engineering tools, but in their integration for engineering practice. Students are trained to conceive, develop, design, construct, maintain and renew these systems in a complex urban environment, whether they are working in the Washington, DC metropolitan area, or the megacities of Asia; whether they are addressing the small towns of America's heartland or the villages of the developing world. The Civil and Infrastructure Engineering program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

### Who do CIE grads work for and what do they do?

A CIE graduate is expected to be competent in applying both the art and science of engineering, adept at understanding and using the tools available, and capable of examining problems from a variety of perspectives. He or she should also be able to assess objectives and concerns, identify potential solutions, analyze options, and identify and execute a solution. CIE graduates work for organizations including: construction and design-build firms, Departments of Transportation, consulting engineers, water, wastewater, and power utilities, local and federal government, land development firms, and information technology firms.

In many cases, CIE alumni return to Mason to pursue advanced degrees or continue their education at other prestigious graduate schools including Stanford University, Texas A&M University, University of California, University of Florida, University of Virginia, and Virginia Tech.

### Local Industry Participation, Scholarships & Internships

The Civil Engineering Institute (CEI) is a nonprofit corporation supporting Mason's CIE program. CEI was founded by the local engineering industry in 1989. Among many other things, CEI provides financial support to CIE students through scholarships and paid summer internships.

### About the Degree

How we teach our courses is just as important as what we teach. In our classes, we provide students with a variety of computer-based analytical and design tools widely used in the engineering industry. The philosophical thread that runs through the entire Civil & Infrastructure Engineering experience is that engineering is fun, is challenging, demands cooperation and skill, and is of vital importance to society. Furthermore, we have developed a close relationship with the engineering industry to ensure that sound professional practice is used in the classroom. This relationship ensures that our courses offer relevant engineering experiences and exposure to industry leaders.

### Admission Requirements

Admission to George Mason is competitive in that the number of qualified candidates for admission exceeds the number of new students who can be accommodated. Each candidate who presents sufficient admission qualifications is reviewed in context of other qualified applicants. An offer of admission is valid only for the semester for which the student applied. Application for undergraduate admission should be made at <http://admissions.gmu.edu/>.

### Freshman Requirements

The following factors are considered during application review:

- Cumulative high school grade point average for course work completed in grades 9 through 12
- Level of difficulty of course work elected throughout the high school years, particularly in English, mathematics, laboratory sciences, and foreign language
- Scores from the SAT and/or ACT, and TOEFL if appropriate.

# CIVIL & INFRASTRUCTURE ENGINEERING, B.S.

## Transfer Requirements

The University accepts qualified students who wish to transfer from other colleges. A transfer applicant who has completed at least 30 semester hours of transferable credit must submit an official transcript from each collegiate institution attended. Transfer admission to VSE is competitive and requires completion of Calculus I and II with grades of B or better, and completion of 30 transferable credits, including English Composition. Transfer applicants with fewer than 30 semester hours of transferable credit must also submit a copy of their secondary school record, as well as SAT or ACT scores.

## 2017-2018 Sample Schedule for Undergraduate Civil Engineering Majors

### First Semester

MATH 113 Analytical Geometry & Calculus I  
 CHEM 211 + CHEM 213 OR CHEM 251 Gen Chem/Engr  
 ENGR 107 Introduction to Engineering  
 ECON 103 Contemporary Microeconomic Principles  
 \*\*\*\* Mason Core<sup>2</sup>

**Total 16**

### Second Semester

MATH 114 Analytical Geometry & Calculus II  
 PHYS 160 University Physics I  
 PHYS 161 University Physics I Laboratory  
 CDS 130 Computing for Scientists  
 \*\*\*\* Mason Core<sup>2</sup>

**TOTAL 14**

### Third Semester

CEIE 203 Geomatics and Engineering Graphics  
 MATH 213 Analytical Geometry & Calculus III  
 PHYS 260 University Physics II  
 PHYS 261 University Physics II Laboratory  
 \*\*\*\* Mason Core<sup>2</sup>  
 \*\*\*\* Mason Core<sup>2</sup>

**TOTAL 16**

### Fourth Semester

CEIE 210 Statics  
 CEIE 240 Hydraulics  
 MATH 214 Elementary Differential Equations  
 ENGH 302 Adv Comp (Natural Sciences Section)\*\*\*  
 STAT 344 Probability and Statistics for Engineers

**TOTAL 15**

### Fifth Semester

CEIE 301 Engineering & Econ Models in Civil Engr  
 CEIE 304 Junior Engineering Competency Exam  
 CEIE 310 Mechanics of Materials  
 CEIE 331 Soil Mechanics  
 CEIE 340 Water Resources Engineering  
 PHYS 266 Introduction to Thermodynamics  
 \*\*\*\* Mason Core<sup>2</sup>

**TOTAL 16**

### Sixth Semester

CEIE 311 Structural Analysis  
 CEIE 355 Environmental Engineering and Science  
 CEIE 360 Introduction to Transportation Engineering  
 CEIE 370 Construction Systems  
 BIOL 377 Applied Ecology

**TOTAL 15**

### Seventh Semester

CEIE 404 Senior Engineering Competency Examination  
 CEIE 409 Professional Practice and Management in Engr  
 CEIE 4xx Technical Core Elective<sup>3</sup>  
 CEIE 4xx Technical Core Elective<sup>3</sup>  
 CEIE 4xx Technical Core Elective<sup>3</sup>  
 CEIE 4xx Technical Elective<sup>4</sup>  
 CEIE 4xx Technical Elective<sup>4</sup>

**TOTAL 16**

### Eighth Semester

CEIE 490 Senior Design Project  
 CEIE 4xx Technical Core Elective<sup>3</sup>  
 CEIE 4xx Technical Elective<sup>4</sup>  
 CEIE 4xx Technical Elective<sup>4</sup>

**TOTAL 12**

<sup>2</sup> \* <http://catalog.gmu.edu/mason-core> Mason Core Categories: One course from each: Oral Communication, ENGH101, Literature, and in two of three areas of Arts, Global Understanding and Western Civilization/World History. The last two Mason Core areas to be satisfied must be approved by the CEIE advisor. VSE students do not need to seek out Science, Math, and IT categories as they are built into the major curriculum.

\*\*\* ENGH 101 and Mason Core-Literature must be completed before taking ENGH 302.

<sup>3</sup>A total of eight CEIE Technical Elective courses must be selected. The four Core Electives must be selected from four different Civil Engineering specialty areas: structural engineering (CEIE 412 or 413), water resources engineering (CEIE 440 or 442), environmental engineering (CEIE 450, 453), transportation engineering (CEIE 461 or 462), construction (CEIE 471, CEIE 472) and geotechnical (CEIE 432 and 435).

<sup>4</sup> The fifth, sixth and seventh CEIE Technical Elective course may be selected from any CEIE 4xx course. The eighth CEIE technical Elective course may be selected from any CEIE 4xx course or related advanced science or engineering course approved by the student's advisor.

### We invite requests for additional information. Please contact:

Sid and Reva Dewberry Department of Civil, Environmental & Infrastructure Engineering  
 Volgenau School of Engineering, George Mason University  
 4400 University Drive, MSN 6C1  
 1300 Nguyen Engineering Building, Fairfax, VA 22030  
 Phone: 703.993.1675 [www.civil.gmu.edu](http://www.civil.gmu.edu) [ceie@gmu.edu](mailto:ceie@gmu.edu)