

**Volgenau School of Engineering - Civil and Infrastructure Engineering, BS**

Catalog Year: 2019 - 2020		Grades		
Mason Core Requirements (15 credits)	Course Information	Credits	Earned	Needed
Written Communication:	ENGH 101 (100)	3		
*Oral Communication	*Satisfied by Major Requirements (COMM 100 or 101)			
*Quantitative Reasoning	*Satisfied by Major Requirements			
*Information Technology	*Satisfied by Major Requirements (CDS 130)			
Select two course from the following areas: Arts, Global Understanding, and/or Western Civilization/World History		6		
Literature		3		
*Natural Science	*Satisfied by Major Requirements			
*Social & Behavioral Science	*Satisfied by Major Requirement (ECON 103)			
**Written Communication	ENGH 302 - **Natural Science Section Only	3		
*Capstone/Synthesis	*Satisfied by Major Requirement (CEIE 490)			
<b>Major Requirements (103 credits required)</b> Students must complete all math, science and Volgenau School of Engineering courses presented as part of the required 120 credits for the degree with a grade of C or better.				
Civil Engineering Core Requirements (37 credits)		Credits	Earned	Needed
CEIE 203	Geomatics and Engineering Graphics	3		
CEIE 210	Statics	3		
CEIE 240	Hydraulics	3		
CEIE 301	Engineering and Economic Models in Civil Engineering	3		
CEIE 304	Jr Engineering Competency Exam	0		
CEIE 310	Mechanics of Materials	3		
CEIE 311	Structural Analysis	3		
CEIE 331	Soil Mechanics	3		
CEIE 340	Water Resource Engineering	3		
CEIE 355	Environmental Engineering and Science	3		
CEIE 360	Introduction to Transportation Engineering	3		
CEIE 370	Construction Systems	3		
CEIE 409	Professional Practice and Management in Engineering	1		
CEIE 490	Senior Design Project	3		
<b>Technical Electives (24 credits):</b> Select 12 credits of CEIE Technical Electives from four different specialty areas from among the following six Civil Engineering specialty areas: <b>Construction:</b> CEIE 471/571, 476/576; <b>Environmental:</b> CEIE 450/55, 453/553; <b>Geotechnical:</b> CEIE 432/532, 435/535; <b>Structural:</b> CEIE 412/512, 413/513, 414; <b>Transportation:</b> CEIE 461/561, 462/562; <b>Water Resources:</b> CEIE 440/540, 442/542. Twelve credits of CEIE technical electives from any CEIE 4xx course				
Technical Elective #1:		3		
Technical Elective #2:		3		
Technical Elective #3:		3		
Technical Elective #4:		3		
Technical Elective #5:		3		
Technical Elective #6:		3		
Technical Elective #7:		3		
Technical Elective #8:		3		
Additional Support Coursework (42 credits)		Credits	Earned	Needed
COMM 100 or 101	Public Speaking or Fundamentals of Communication	3		
ECON 103	Contemporary Microeconomic Principles	3		
CHEM 211/213 or CHEM 271/271	General Chemistry with Lab or General Chemistry for Engineers with Lab	4		
BIOL 107 or 177	Intro Biology II Lecture or Ecological Applications	3		
CDS 130	Computing for Scientists	3		
MATH 113	Analytic Geometry and Calculus I	4		
MATH 114	Analytic Geometry and Calculus II	4		
MATH 213	Analytic Geometry and Calculus III	3		
MATH 214	Elementary Differential Equations	3		
PHYS 160/161 and 260/261	University Physics I & II	8		
PHYS 266	Introduction to Thermodynamics	1		
STAT 344	Probability and Statistics for Engineers and Scientists I	3		



## Volgenau School of Engineering

# CIVIL & INFRASTRUCTURE ENGINEERING, B.S. 2019- 2020

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.

# CIVIL & INFRASTRUCTURE ENGINEERING, B.S.

## 2019-2020 Sample Schedule for Undergraduate Civil Engineering Majors

<b>First Semester</b>		<b>Second Semester</b>	
MATH 113 Analytical Geometry & Calculus I	4	MATH 114 Analytical Geometry & Calculus II	4
CHEM 211 & CHEM 213 <b>OR</b> CHEM 271 & CHEM 272 Gen Chem/Engr	4	PHYS 160 University Physics I	3
CEIE 101 Introduction to Civil Engineering or ENGR 107 Introduction to Engineering	2	PHYS 161 University Physics I Laboratory	1
ECON 103 Contemporary Microeconomic Principles	3	CDS 130 Computing for Scientists	3
**** Mason Core <sup>1</sup>	3	BIOL 107 Intro Biology II or BIOL 177 Ecological Applications	3
<b>Total</b>	<b>16</b>	<b>TOTAL</b>	<b>14</b>
<b>Third Semester</b>		<b>Fourth Semester</b>	
CEIE 203 Geomatics & Engineering Graphics	3	CEIE 210 Statics	3
MATH 213 Analytical Geometry & Calculus III	3	CEIE 240 Hydraulics	3
PHYS 260 University Physics II	3	MATH 214 Elementary Differential Equations	3
PHYS 261 University Physics II Laboratory	1	ENGH 302 Adv Comp (Natural Sciences <b>OR</b> Multi- Disciplinary Section)***	3
**** Mason Core Literature <sup>1</sup>	3	STAT 344 Probability & Statistics for Engineers	3
**** Mason Core <sup>1</sup>	3		
<b>TOTAL</b>	<b>16</b>	<b>TOTAL</b>	<b>15</b>
<b>Fifth Semester</b>		<b>Sixth Semester</b>	
CEIE 301 Engineering & Econ Models in Civil Engr	3	CEIE 311 Structural Analysis	3
CEIE 304 Junior Engineering Competency Exam	0	CEIE 355 Environmental Engineering and Science	3
CEIE 310 Mechanics of Materials	3	CEIE 360 Introduction to Transportation Engineering	3
CEIE 331 Soil Mechanics	3	CEIE 370 Construction Systems	3
CEIE 340 Water Resources Engineering	3	**** Mason Core <sup>1</sup>	3
PHYS 266 Introduction to Thermodynamics	1		
**** Mason Core <sup>1</sup>	3	<b>TOTAL</b>	<b>15</b>
<b>TOTAL</b>	<b>16</b>		
<b>Seventh Semester</b>		<b>Eighth Semester</b>	
CEIE 409 Professional Practice & Management in Engr	1	CEIE 490 Senior Design Project	3
CEIE 4xx Technical Core Elective <sup>2</sup>	3	CEIE 4xx Technical Core Elective <sup>2</sup>	3
CEIE 4xx Technical Core Elective <sup>2</sup>	3	CEIE 4xx Technical Elective <sup>3</sup>	3
CEIE 4xx Technical Core Elective <sup>2</sup>	3	CEIE 4xx Technical Elective <sup>3</sup>	3
CEIE 4xx Technical Elective <sup>3</sup>	3	<b>TOTAL</b>	<b>12</b>
CEIE 4xx Technical Elective <sup>3</sup>	3		
<b>TOTAL</b>	<b>16</b>		

<sup>1</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. 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>2</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 or 414), water resources engineering (CEIE 440 or 442), environmental engineering (CEIE 450 or 453), transportation engineering (CEIE 461 or 462), construction (CEIE 471 or 476 or 478) and geotechnical (CEIE 432 or 435).

<sup>3</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 (400-level) science or engineering course approved by the student's advisor.

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

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