

College of Engineering
VIA DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING
Degree: Bachelor of Science in Civil Engineering (BSCE)
Major: Civil Engineering
For Students Entering Under Undergraduate Catalog 2021-2022
Credits Required for Graduation: 128

FALL SEMESTER FIRST YEAR		Credits	SPRING SEMESTER FIRST YEAR		Credits
CHEM 1035 General Chemistry ⁽²⁾ Co: MATH 1025 or MATH 1225	3		ENGL 1106 First-Year Writing ⁽²⁾ Pre: ENGL 1105	3	
CHEM 1045 General Chemistry Lab Co: CHEM 1035	1		MATH 1226 Calculus of a Single Variable ⁽²⁾ # (C-) Pre: MATH 1225 (C-)	4	
ENGL 1105 First-Year Writing ⁽²⁾	3		PHYS 2305 Foundations of Physics w/lab ⁽²⁾ Pre: (MATH 1205 or MATH 1205H or MATH 1225) or (MATH 1206 or MATH 1206H or MATH 1226). Co: 2325 or (MATH 1206 or MATH 1206H or MATH 1226)	4	
MATH 1225 Calculus of a Single Variable ⁽²⁾ Pre: Math Ready	4		ENGE 1216 Foundations of Engineering ⁽²⁾ # (C-) Pre: ENGE 1215 (C-)	2	
ENGE 1215 Foundations of Engineering ⁽²⁾	2		ECON 2005 Principles of Economics ⁽²⁾	3	
Pathways ⁽²⁾	3				
TOTAL	16		TOTAL	16	
FALL SEMESTER SECOND YEAR		Credits	SPRING SEMESTER SECOND YEAR		Credits
ESM 2104 Statics Pre: MATH 1226. Co: MATH 2204 or MATH 2204H or MATH 2224 or MATH 2406H.	3		ESM 2204 Mechanics of Deformable Bodies Pre: (2104 or 2114), (MATH 2224 or MATH 2224H or MATH 2204 or MATH 2204H)	3	
MATH 2114 Introduction to Linear Algebra Pre: MATH 1225 (min grade of B) or MATH 1226	3		GEOS 2104 Elements of Geology	3	
MATH 2204 Multivariable Calculus Pre: MATH 1226	3		CEE 3804 Computer Applications for Civil and Environmental Engineers ⁽²⁾ Pre: Junior Standing	3 ^[F,S]	
CEE 2834 Civil Engineering Drawings and Virtual Modeling ⁽¹⁾	3 ^[F,S]		MATH 2214 Differential Equations Pre: MATH 1114 or MATH 2114 or MATH 2114H or MATH 2405H, MATH 1226	3	
CEE 2804 Introduction to Civil and Environmental Engineering ⁽²⁾	3 ^[F]		CEE 2814 Civil and Environmental Engineering Measurements w/lab ⁽¹⁾ Pre: (ENGE 1216 or ENGE 1414 or BC 1224), (MATH 1206 or MATH 1206H or MATH 1226). Co: 2824	4 ^[F,S]	
TOTAL	15		TOTAL	16	
FALL SEMESTER THIRD YEAR		Credits	SPRING SEMESTER THIRD YEAR		Credits
CEE 3304 Fluid Mechanics for Civil and Environmental Engineering w/lab ⁽²⁾ Pre: ESM 2104, CEE 2804	4 ^[F,S]		CEE 3814 Analytics in CEE ⁽¹⁾ Pre: 3804	3 ^[F,S]	
ISE 2014 Engineering Economy	2 ^[F,S]		CEE Fundamental Course (with Lab) ⁽¹⁾	4 ^[F,S]	
CEE Fundamental Course (with Lab) ⁽¹⁾	4 ^[F,S]		CEE Fundamental Course ⁽¹⁾	3 ^[F,S]	
CEE Fundamental Course ⁽¹⁾	3 ^[F,S]		CEE Fundamental Course ⁽¹⁾	3 ^[F,S]	
Science and Engineering Elective	3		CEE 4804 Professional and Legal Issues in Engineering ⁽²⁾ Pre: 2804; Co: 3304	3 ^[F,S]	
TOTAL	16		TOTAL	16	
FALL SEMESTER FOURTH YEAR		Credits	SPRING SEMESTER FOURTH YEAR		Credits
CEE Fundamental Course ⁽¹⁾	3 ^[F,S]		CEE Advanced Course	3	
CEE Advanced Course	3		CEE Advanced Course	3	
CEE Advanced Course	3		CEE Advanced Course	3	
Fundamental or Advanced Course (If 4 cr. course taken, reduce overall Free Electives by 1 credit)	3		Pathways ⁽²⁾	3	
Pathways ⁽²⁾	3		Science and Engineering Elective	3	
Pathways ⁽²⁾	3		Free Elective	3	
TOTAL	18		CLE Area 7 taken here if not previously satisfied	TOTAL	15

General Information about Checksheet: Superscripts [F,S,SI,SII] in Credits column indicates semesters when a CEE course is known to be offered. Course offerings are subject to change and the availability of sufficient resources. CEE Advanced courses may not be offered each academic term. Students must confirm course offerings in advance with their CEE Advisor.

A C- or better grade is required in any course that is a prerequisite for a course with a CEE designator.

#The notation **(C-)** shown is provided for first year advising purposes only and indicates that those courses are prerequisites for a course with a CEE designator. This notation is not shown in subsequent years. Students must verify prerequisites when forming their academic plan.

⁽¹⁾Indicates a degree core requirement. Note: Six of the eight Fundamental electives partially satisfy degree core requirements.

⁽²⁾Indicates a course used to satisfy Pathways requirements.

Pathways to General Education – Required courses that count toward meeting Pathways requirements are indicated in bold font inside the shaded cells in table below. Consult: pathways.prov.vt.edu/about/table.html for courses. Pathways courses must be completed prior to graduation.				
Pathways Concept 1: Discourse (9 credits)	<i>Foundational:</i> ENGL 1105	(3)	<i>Foundational:</i> ENGL 1106	(3)
	<i>Advanced:</i> CEE 2804+3304+4804			(3)
Pathways Concept 2: Critical Thinking in the Humanities (6 cr)		(3)		(3)
Pathways Concept 3: Reasoning in the Social Sciences (6 cr)	ECON 2005	(3)		(3)
Pathways Concept 4: Reasoning in the Natural Sciences (6 cr)	PHYS 2305	(3)	CHEM 1035	(3)
Pathways Concept 5: Quantitative and Computational Thinking (9 cr)	<i>Foundational:</i> MATH 1225	(3)	<i>Foundational:</i> MATH 1226	(3)
	<i>Advanced:</i> CEE 3804			(3)
Pathways Concept 6: Critique and Practice in Design and the Arts (6 cr)	<i>Arts:</i>			(3)
	<i>Design:</i> ENGE 1215 + ENGE 1216 or ENGE 1414			(3)
Pathways Concept 7: Critical Analysis of Identity & Equity in the US	Pathways 7 should be double-counted with either a Pathways 2 or 3 course to avoid taking any additional credit hours			(3)

CEE Electives: The CEE department requires 6 credits of **Science and Engineering Electives**; 20 credits of **Fundamental Electives**, 12 credits of **Advanced Electives**; 3 additional credits of **either Fundamental or Advanced electives**; and 3 credits of **Free Electives** as follows:

Science and Engineering Electives—6 credits (C- policy applies). Select from the list on Page 3. At least 3 credits must be in CEE. Some courses have prerequisites. All courses are 3 cr. unless noted otherwise.

CEE Fundamental and Advanced Technical Electives—35 credits (C- policy applies): Electives are arranged to provide adequate breadth and depth of knowledge in CEE and specialty areas of interest. Thirty-five credits of courses must be selected from the lists on Page 3, which meet the following criteria:

1. Complete 6 of the 8 *Fundamental courses*, at least two of which must have a lab (20 cr). These courses count toward satisfying degree core requirements.
2. Complete 1 *Advanced course* in 3 of the 6 specialty areas in which fundamental courses were selected in step 1 (9 cr).
3. Complete an additional *Advanced course* in 1 of the 3 specialty areas in which advanced courses were selected in step 2 (3 cr).
4. Complete one additional course *Fundamental or Advanced course* (3 cr).
5. Within the choices above, complete at least one *Design Project course*: **CEE 3434 (4 cr; if taken reduce overall Free Electives by 1 credit), 4014, 4104, 4274, 4334, 4544, 4654, or 4664.**

Free Elective—3 credits _____

Change of Major Requirements: Please see enge.vt.edu/em

Foreign Language Requirements: Students must have had two years of a foreign language in high school or one year at the college level (6 credit hours) of the same language. College-level credits used to meet this requirement do not count towards the degree.

Satisfactory Progress Towards Degree: University Policy 91 outlines university-wide minimum criteria to determine if students are making satisfactory progress towards the completion of their degrees. The CEE Department fully supports this policy. Specific expectations for satisfactory progress for Civil Engineering majors are as follows:

- Each student must meet the minimum University-wide criteria as described in Policy 91 and summarized in the Undergraduate Catalog (undergradcatalog.registrar.vt.edu/).
- A 2.0 overall GPA and a 2.0 in-major GPA must be maintained for continued enrollment in CEE. The in-major GPA consists of all courses taken with a CEE designator.
- Upon completion of 64 GPA hours, a student must have satisfactorily completed CEE 2804, CEE 2814, and CEE 2834.
- Be enrolled in at least one 3-credit CEE course each fall and spring semester.

***Prerequisites:** Some courses on this checklist have pre-/corequisites; please consult the University Course Catalog (<https://www.undergradcatalog.registrar.vt.edu/>), or check with your advisor for the most current pre-requisites. There are no hidden pre-requisites in the program of study.

Graduation Requirements: Students must pass all required courses and both the in-major and overall GPA must be at least 2.0 for graduation. The in-major GPA consists of all courses taken under the CEE designation.

Additional Checklist Comments: Displayed course offerings are subject to sufficient resources. Courses are taught in the term in which they appear on the checklist. CEE Fundamentals courses are typically taught each fall and spring term, whereas CEE Advanced courses may not be offered each academic term. Consult the CEE course listing and your departmental advisor for updates.

Science and Engineering Electives—6 credits (C- policy applies). Select from the following list. All courses 3 cr. unless noted otherwise. At least 3 credits must be in CEE. Some courses have prerequisites*.

CS 1064 Intro to Programming in Python*	CEE 4034 Smart Sustainable Infrastructure*
GEOG 2084 Principles of GIS*	CEE 4114 Fund Public Health Engineering*
ESM 2304 Dynamics*	CEE 4134 Sustainable Systems*
ESM 3054 (MSE 3054) Mech Behavior of Materials*	CEE 4384 Coastal Engineering*
ENGR 3124 Green Engineering*	CEE 4394 Urban Water Sustainability*
	CEE 4554 Natural Disasters*
BIOL 1105 Principles of Biology*	CEE 4634 Infrastructure Condition Assessment*
PHYS 2306 Foundations of Physics* (4cr)	CEE 4814 Risk and Reliability in CEE*
	CEE 4824 Intro to Forensic Engineering*
	CEE 4844 BIM and Integrated Practices*
	CEE 4974 Independent Study
	CEE 4994 Undergraduate Research

Fundamental Courses – 20 credits (C- policy applies. Courses are 3 cr. except lab courses which are 4 cr.)

CEE 3014 Construction Management*	CEE 3404 Intro to Structural Engineering*
CEE 3104 Intro to Environmental Engineering*	CEE 3514 Intro to Geotechnical Engineering* (lab)
CEE 3274 Intro to Land Development*	CEE 3604 Intro to Transportation Engineering*
CEE 3314 Water Resources Engineering* (lab)	CEE 3684 Civil Engineering Materials* (lab)

Advanced Courses – 12 Credits (C- policy applies. Courses in bold font are *Design Project* courses)

<i>Construction</i>	<i>Structures</i>
CEE 4014 (BC 4024) Est, Prod & Cost Engr*	CEE 3424 Reinforced Concrete Structures I*
CEE 4024 Const Control Tech*	CEE 3434 Design of Steel Structures I* (4c)
CEE 4034 Smart Sustainable Infrastructure*	CEE 4404 Intermediate Struct Analysis*
CEE 4074 Const Means & Methods*	CEE 4454 Masonry Structural Design*
<i>Environmental</i>	<i>Materials</i>
CEE 4104 Water & Wastewater Design*	CEE 4610 (ESM 4044) Mech. Composite Materials*
CEE 4114 Fund Pub Health Engr*	CEE 4614 Advanced Structural Concretes*
CEE 4134 Sustainable Systems*	CEE 4634 Infrastructure Condition Assessment*
CEE 4144 Air Resources Engineering*	CEE 4664 Pavement Design*
CEE 4174 Solid & Haz Waste Mgt*	
	<i>Geotechnical</i>
<i>Land Development</i>	CEE 4514 Methods Geotech Engr*
CEE 4254 Municipal Engineering*	CEE 4534 Earth Pressures & Foundation
CEE 4264 Sustainable Land Development*	CEE 4544 Design of Earth Structures*
CEE 4274 Land Development Design*	CEE 4564 Intro to Coastal Marine Geotechnics*
CEE 4284 Advanced Land Development Design*	
	<i>Transportation</i>
<i>Water Resources</i>	CEE 4604 Traffic Engineering*
CEE 4304 Hydrology*	CEE 4624 Planning Transportation Facilities*
CEE 4314 Groundwater Resources*	CEE 4654 Geometric Design of Highways*
CEE 4324 Open Channel Flow*	CEE 4674 Airport Planning and Design*
CEE 4334 Hydraulic Structures*	CEE 4684 Transportation Safety*
CEE 4344 Water Resources Planning*	CEE 4694 Freight Operations*
CEE 4384 Coastal Engineering*	
CEE 4394 Urban Water Sustainability*	