

## CIVIL ENGINEERING ADVISING GUIDE (2025-2026)

All degree programs are comprised of courses for Pathways General Education, Degree Core, Major, and Electives. The [2025-2026 Undergraduate Catalog](#) and the updated [Degree Audit Reporting System \(DARS\)](#) are the **official** way to view the program requirements. The catalog will be available July 2025 and the DARS will be available by December 2025.

**Prerequisite:** Course(s) needed prior to taking the listed courses.

**Corequisite:** Course(s) needed along with or prior to the listed course.

**Minimum Grades:** If a minimum grade above passing is necessary, it is denoted in parenthesis next to the title.

**This guide is designed to assist you with course planning and is to be used in conjunction with the [Academic Catalog](#). Students are responsible for verifying degree requirements are met in the Degree Audit Report System (DARS).**

### PROGRAM CURRICULUM

<https://catalog.vt.edu/undergraduate/college-engineering/civil-environmental-engineering/civil-engineering-bs/>

The program curriculum provides the course requirements for Civil Engineering.

### Pathways General Education Courses <sup>2</sup>

Course	Title	Concept	Credits	Prerequisite and Corequisites
<input type="checkbox"/> ENGL 1105	First-Year Writing	1F	3	None
<input type="checkbox"/> ENGL 1106	First-Year Writing	1F	3	Pre: ENGL 1105
<input type="checkbox"/> CEE 2804	Intro to Civil and Environmental Engineering	1A	3	
<input type="checkbox"/> CEE 3304	Fluid Mechanics for Civil and Environmental Engineering	1A	4	Pre: ESM 2104; CEE 2804
<input type="checkbox"/> CEE 4804	Professional and Legal Issues in Civil Engineering	1A	3	Pre: CEE 2804; Co: CEE 3304
<input type="checkbox"/> Pathways Concept 2	Select three credits from Pathways Concept 2	2	3	
<input type="checkbox"/> Pathways Concept 2	Select three credits from Pathways Concept 2	2	3	
<input type="checkbox"/> Pathways Concept 3	Select three credits from Pathways Concept 3	3	3	
<input type="checkbox"/> Pathways Concept 3	Select three credits from Pathways Concept 3	3	3	
<input type="checkbox"/> PHYS 2305	Foundations of Physics	4	4	Pre: MATH 1225
<input type="checkbox"/> CHEM 1035	General Chemistry	4	3	Pre: CHEM 1014, MATH 1014, MATH 1025, MATH 1536, MATH 1225, MATH 1214, or MATH 1524
<input type="checkbox"/> MATH 1225	Calculus of a Single Variable	5F	4	Pre: MATH 1214
<input type="checkbox"/> MATH 1226	Calculus of a Single Variable	5F	4	Pre: MATH 1225
<input type="checkbox"/> CEE 3804	Computer Applications for Civil and Environmental Engineering	5A	3	
<input type="checkbox"/> ENGE 1215	Foundations of Engineering	6D	2	None
<input type="checkbox"/> ENGE 1216	Foundation of Engineering	6D	2	Pre: ENGE 1215
<input type="checkbox"/> Pathways Concept 6	Select three credits from Pathways Concept 6A	6A	3	
<input type="checkbox"/> Pathways Concept 7	Pathways 7 course should be double-counted w/ Pathways 2 or 3 to avoid taking additional cr. hrs.	7	--	
<b>Subtotal</b>			<b>53</b>	

### Degree Core Courses

Course	Title	Credits	Prerequisites and Corequisites
<input type="checkbox"/> CEE 2834	Civil Engineering Drawings and Virtual Modeling	3	None
<input type="checkbox"/> CEE 2814	Geomatics	4	Pre: (ENGE 1216 or ENGE 1414); Co: CEE 2834
<input type="checkbox"/> CEE 3814	Analytical Tools in Civil & Environmental Engr.	3	Pre: CEE 3804
<input type="checkbox"/> CEE Fundamental Elective with Lab*		4	Pre: Varies
<input type="checkbox"/> CEE Fundamental Elective with Lab*		4	Pre: Varies
<input type="checkbox"/> CEE Fundamental Elective*		3	Pre: Varies
<input type="checkbox"/> CEE Fundamental Elective*		3	Pre: Varies
<input type="checkbox"/> CEE Fundamental Elective*		3	Pre: Varies
<input type="checkbox"/> CEE Fundamental Elective*		3	Pre: Varies
<b>Subtotal</b>		<b>30</b>	

### Major Required Courses

Course	Title	Credits	Prerequisites and Corequisites
<input type="checkbox"/> CHEM 1045	General Chemistry Lab	1	Co: CHEM 1035
<input type="checkbox"/> ESM 2104	Statics	3	Pre: MATH 1226; Co: MATH 2204
<input type="checkbox"/> ESM 2204	Mechanics of Deformable Bodies	3	Pre: ESM 2104, MATH 2204
<input type="checkbox"/> GEOS 2104	Elements of Geology	3	None
<input type="checkbox"/> ISE 2014	Engineering Economy	2	None
<input type="checkbox"/> MATH 2114	Introduction to Linear Algebra	3	Pre: MATH 1225 (B) or MATH 1226
<input type="checkbox"/> MATH 2204	Introduction to Multivariable Calculus	3	Pre: MATH 1226
<input type="checkbox"/> MATH 2214	Introduction to Differential Equations	3	Pre: MATH 1226, MATH 2114
<input type="checkbox"/> CEE Advanced Elective*		3	Pre: Varies
<input type="checkbox"/> CEE Advanced Elective*		3	Pre: Varies
<input type="checkbox"/> CEE Advanced Elective*		3	Pre: Varies
<input type="checkbox"/> CEE Advanced Elective (Design Project)*		3	Pre: Varies
<input type="checkbox"/> ENGE 3900 <sup>1</sup>	Career Bridge Experience <sup>1</sup>	0	None
<b>Subtotal</b>		<b>33</b>	

\*Fundamental and Advanced Program Electives course options can be found in the [2025-2026 Undergraduate Catalog](#).

### Technical & Restricted Elective Courses

The list of courses in each elective category can be found in the [2025-2026 Undergraduate Catalog](#).

Course	Credits	Prerequisites and Corequisites
<input type="checkbox"/> CEE Technical Elective	3	Pre: Varies
<input type="checkbox"/> CEE Technical Elective	3	Pre: Varies
<input type="checkbox"/> Restricted Elective	3	Pre: Varies
<input type="checkbox"/> Restricted Elective	3	Pre: Varies
<b>Subtotal</b>		<b>12</b>

**Total Credits: 128**

## ROADMAP (Starting Math: Calculus)

The roadmap provides a suggested plan for when to schedule each course.

Year 1					
Fall			Spring		
CHEM 1035	General Chemistry	3	PHYS 2305	Foundations of Physics	4
CHEM 1045	General Chemistry Lab	1	ENGL 1106	First-Year Writing	3
ENGL 1105	First-Year Writing	3	MATH 1226	Calculus of a Single Variable	4
MATH 1225	Calculus of a Single Variable	4	ENGE 1216	Foundations of Engineering	2
ENGE 1215	Foundations of Engineering	2	Pathways	Concept 2, 3, 6a, or 7	3
Pathways	Concept 2, 3, 6a, or 7	3			
		<b>Credits</b>			<b>16</b>
					<b>Credits</b>
					<b>16</b>
Year 2					
Fall			Spring		
ESM 2104	Statics	3	ESM 2204	Mechanics of Deformable Bodies	3
CEE 2834	Civil Engineering Drawings & Virtual Modeling	3	GEOS 2104	Elements of Geology	3
CEE 2804	Introduction to CEE	3	CEE 3804	Computer Applications for CEE	3
MATH 2114	Intro to Linear Algebra	3	MATH 2214	Intro to Differential Equations	3
MATH 2204	Intro to Multivariable Calc.	3	CEE 2814	Geomatics	4
		<b>Credits</b>			<b>15</b>
					<b>Credits</b>
					<b>16</b>
Year 3					
Fall			Spring		
CEE 3304	Fluid Mechanics for CEE	4	CEE 3814	Analytical Tools in CEE	3
ISE 2014	Engineering Economy	2	CEE 4804	Professional & Legal Issues in CE	3
CEE Fundamental Elective with Lab		4	CEE Fundamental Elective with Lab		4
CEE Fundamental Elective		3	CEE Fundamental Elective		3
Pathways	Concept 2, 3, 6a, or 7	3	CEE Fundamental Elective		3
		<b>Credits</b>			<b>16</b>
					<b>Credits</b>
					<b>16</b>
Year 4					
Fall			Spring		
CEE Fundamental Elective		3	CEE Advanced Elective		3
CEE Advanced Elective		3	CEE Advanced Elective		3
CEE Advanced Elective – Design Project		3	Technical Elective		3
Technical Elective		3	Restricted Elective		3
Restricted Elective		3	Pathways*	Concept 2, 3, 6a, or 7	3
Pathways	Concept 2, 3, 6a, or 7	3	*Pathways 7 course should be double-counted w/ Pathways 2 or 3 to avoid taking additional cr. hrs.		
		<b>Credits</b>			<b>18</b>
					<b>Credits</b>
					<b>15</b>

The CEE Course Listing is available at <https://www.webapps.cee.vt.edu/index.php?category=course>. CEE course offerings are subject to change.



## Fundamental, Advanced, and Interdisciplinary Technical Electives

*Use this list to choose fundamental (20 cr), advanced (12 cr), and technical elective (6-12 cr) requirements.  
 These courses cannot double count.*

### Construction Engineering and Management

<b>CEE 3014</b>	Construction Management (Fundamental)	3
<b>CEE 4014</b>	<b>Estimating, Production, and Cost Engineering</b> <sup>3</sup>	3
<b>CEE 4024</b>	Construction Control Techniques	3
<b>CEE 4034</b>	Smart Sustainable Infrastructure	3
<b>CEE 4074</b>	Construction Engineering: Means and Methods	3

### Structural Engineering and Materials

<b>CEE 3404</b>	Introduction to Structural Engineering (Fundamental)	3
<b>CEE 3424</b>	Reinforced Concrete Structures I	3
<b>CEE 3434</b>	<b>Design of Steel Structures I</b> <sup>3</sup>	4
<b>CEE 4404</b>	Intermediate Structural Analysis	3
<b>CEE 4454</b>	Masonry Structural Design	3

### Environmental Engineering

<b>CEE 3104</b>	Introduction to Environmental Engineering (Fundamental)	3
<b>CEE 4104</b>	<b>Water and Wastewater Treatment Design</b> <sup>3</sup>	3
<b>CEE 4114</b>	Fundamentals of Public Health Engineering	3
<b>CEE 4134</b>	Environmental Sustainability - A Systems Approach	3
<b>CEE 4144</b>	Air Resources Engineering	3

### Materials

<b>CEE 3684</b>	Civil Engineering Materials (Fundamental with lab)	4
<b>CEE 4610</b>	Mechanics of Composite Materials	3
<b>CEE 4614</b>	Concrete Materials	3
<b>CEE 4634</b>	Infrastructure Condition Assessment	3
<b>CEE 4664</b>	<b>Pavement Design</b> <sup>3</sup>	3

### Land Development

<b>CEE 3274</b>	Introduction to Land Development Design (Fundamental)	3
<b>CEE 4264</b>	Sustainable Land Development	3
<b>CEE 4274</b>	<b>Land Development Design</b> <sup>3</sup>	3
<b>CEE 4284</b>	Advanced Land Development Design	3

### Geotechnical Engineering

<b>CEE 3514</b>	Introduction to Geotechnical Engineering (Fundamental with lab)	4
<b>CEE 4514</b>	Methods in Geotechnical Engineering	3
<b>CEE 4534</b>	Earth Pressures and Foundation Structures	3
<b>CEE 4544</b>	<b>Design of Earth Structures</b> <sup>3</sup>	3
<b>CEE 4564</b>	Introduction to Coastal and Marine Geotechnics	3

### Water Resources Engineering

<b>CEE 3314</b>	Water Resources Engineering (Fundamental with lab)	4
<b>CEE 4304</b>	Hydrology	3
<b>CEE 4314</b>	Groundwater Resources	3

**Degree:** Bachelor of Science in Civil Engineering

**Major:** Civil Engineering

**Program Requirements:** *Catalog Year 2025-2026*



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<a href="#"><u>CEE 4324</u></a>	Open Channel Flow	3
<a href="#"><u>CEE 4334</u></a>	<b>Hydraulic Structures</b> <sup>3</sup>	3
<a href="#"><u>CEE 4344</u></a>	Water Resources Planning	3
<a href="#"><u>CEE 4364</u></a>	<b>Geospatial Analysis and Hydrologic Design</b> <sup>3</sup>	3
<a href="#"><u>CEE 4384</u></a>	Coastal Engineering	3
<a href="#"><u>CEE 4394</u></a>	Urban Water Sustainability	3

**Transportation Engineering**

<a href="#"><u>CEE 3604</u></a>	Introduction to Transportation Engineering (Fundamental)	3
<a href="#"><u>CEE 4604</u></a>	Traffic Engineering	3
<a href="#"><u>CEE 4624</u></a>	Planning Transportation Facilities	3
<a href="#"><u>CEE 4654</u></a>	<b>Geometric Design of Highways</b> <sup>3</sup>	3
<a href="#"><u>CEE 4674</u></a>	Airport Planning and Design	3
<a href="#"><u>CEE 4684</u></a>	Transportation Safety	3
<a href="#"><u>CEE 4694</u></a>	Freight Operations	3

**Interdisciplinary Technical Electives, Independent Study, Undergraduate Research**

<a href="#"><u>CEE 4554</u></a>	Natural Disaster Mitigation and Recovery	3
<a href="#"><u>CEE 4824</u></a>	Introduction to Forensic Engineering	3
<a href="#"><u>CEE 4844</u></a>	Building Information Modeling and Integrated Practices	3
<a href="#"><u>CEE 4974</u></a>	Independent Study	1-19
<a href="#"><u>CEE 4994</u></a>	Undergraduate Research	1-19

**5000-Level Advanced Electives**

Students in their senior year with a 3.00 or better GPA may enroll in 5000-level courses satisfying undergraduate degree requirements. See your academic advisor.

## Restricted Electives

<b>Study Abroad</b>		
<a href="#"><u>CEE 3954</u></a>	Study Abroad	1-19
<b>Programming</b>		
<a href="#"><u>CS 1044</u></a>	Introduction to Programming in C	3
<a href="#"><u>CS 1064</u></a>	Introduction to Programming in Python	3
<a href="#"><u>CS 1114</u></a>	Introduction to Software Design	3
<a href="#"><u>CS 2064</u></a>	Intermediate Programming in Python	3
<b>Engineering Fundamentals, Mechanics, and Materials</b>		
<a href="#"><u>AOE 4054</u></a>	Stability of Structures	3
<a href="#"><u>BSE 3154</u></a>	Thermodynamics of Biological Systems	3
<a href="#"><u>CHE 2114</u></a>	Mass and Energy Balances	3
<a href="#"><u>ESM 3054</u></a>	Mechanical Behavior of Materials	3
<a href="#"><u>ESM 2304</u></a>	Dynamics	3
<a href="#"><u>ISE 3204</u></a>	Manufacturing Processes <sup>4</sup>	3
<a href="#"><u>ME 2134</u></a>	Thermodynamics <sup>4</sup>	4
<a href="#"><u>MSE 2034</u></a>	Elements of Materials Engineering	3
<a href="#"><u>MSE 4304</u></a>	Metals and Alloys <sup>4</sup>	3
<a href="#"><u>SBIO 2124</u></a>	Structure and Properties of Sustainable Biomaterials	3
<a href="#"><u>SBIO 3324</u></a>	Green Building Systems	3
<a href="#"><u>SBIO 4314</u></a>	Design of Wood Structures	3
<a href="#"><u>SBIO 4714</u></a>	Performance of Sustainable Biomaterials in Buildings	3
<b>Statistics and Math</b>		
<a href="#"><u>MATH 3414</u></a>	Numerical Methods	3
<a href="#"><u>MATH 4564</u></a>	Operational Methods for Engineers	3
<a href="#"><u>STAT 4604</u></a>	Statistical Methods for Engineers	3
<b>Science</b>		
<a href="#"><u>CHEM 1036</u></a>	General Chemistry	3
<a href="#"><u>PHYS 2306</u></a>	Foundations of Physics	4
<a href="#"><u>BIOL 1105</u></a>	Principles of Biology	3
<a href="#"><u>GEOS 3014</u></a>	Environmental Geosciences	3
<a href="#"><u>GEOG 3304</u></a>	Geomorphology	3
<a href="#"><u>GEOS 4634</u></a>	Environmental Geochemistry	3
<a href="#"><u>GEOS 4824</u></a>	Engineering Geology	3
<b>Public Policy and Planning</b>		
<a href="#"><u>SPIA 2314</u></a>	Active Transportation for a Healthy, Sustainable Planet	3
<a href="#"><u>SPIA 2554</u></a>	Collaborative Policy-Making and Planning	3
<a href="#"><u>SPIA 3554</u></a>	Transdisciplinary Problem Solving for Social Issues	3
<a href="#"><u>SPIA 3704</u></a>	Urban Contention and Mobilization	3
<a href="#"><u>SPIA 4454</u></a>	Future of Cities	3
<a href="#"><u>SPIA 4464</u></a>	Data and the Art of Policy-Making and Planning	3
<a href="#"><u>UAP 3014</u></a>	Urban Policy and Planning	3
<a href="#"><u>UAP 3024</u></a>	Urban and Regional Analysis	3
<a href="#"><u>UAP 3224</u></a>	Policy Implementation <sup>4</sup>	3
<b>Real Estate</b>		
<a href="#"><u>REAL 4754</u></a>	Real Estate Law	3
<a href="#"><u>UAP 2004</u></a>	Principles of Real Estate	3
<a href="#"><u>REAL 2034</u></a>	Real Estate Data Analysis	3

**Sustainability, Environment, Climate Change**

<b><u>GEOG 2244</u></b>	Sustainable Urbanization	3
<b><u>AAEC 3314</u></b>	Environmental Law	3
<b><u>BSE 3324</u></b>	Small Watershed Hydrology	3
<b><u>BSE 4224</u></b>	Field Methods in Hydrology	3
<b><u>CEM 3074</u></b>	Global Design and Construction for Sustainable Development	3
<b><u>FREC 2124</u></b>	Forests, Society & Climate	3
<b><u>FREC 4464</u></b>	Water Resources Policy and Economics	3
<b><u>FREC 4784</u></b>	Wetland Hydrology and Biogeochemistry	3
<b><u>ENGR 3124</u></b>	Introduction to Green Engineering	3
<b><u>ENGR 4134</u></b>	Environmental Life Cycle Assessment	3
<b><u>MINE 2114</u></b>	Energy and Raw Materials: Geopolitics and Sustainable Development	3
<b><u>SBIO 2504</u></b>	Circular Economy Analytics for Sustainable Systems	3
<b><u>UAP 3354</u></b>	Introduction to Environmental Policy and Planning	3
<b><u>UAP 4374</u></b>	Land Use and Environment: Planning and Policy	3

**Geographic Information Science**

<b><u>BSE 4344</u></b>	Geographic Information Systems for Engineers	3
<b><u>GEOG 2084</u></b>	Principles of Geographic Information Systems	3

**Business, Management, and Economics**

<b><u>AAEC 2104</u></b>	Personal Financial Planning	3
<b><u>AAEC 3324</u></b>	Environment and Sustainable Development Economics	3
<b><u>ECON 2005</u></b>	Principles of Economics	3
<b><u>ECON 2006</u></b>	Principles of Economics	3
<b><u>ISE 4304</u></b>	Global Issues in Industrial Management <sup>4</sup>	3

**Construction**

<b><u>CEM 2714</u></b>	Construction Safety Systems	3
<b><u>CEM 4714</u></b>	Construction Safety Culture	3
<b><u>CEM 4724</u></b>	Construction Industry Futures: Safety, Health, and Wellness	3

## Approved Minors

**Completion of an approved minor from the list below replaces 6 credit hours of Restricted Electives**

- Business (BUSR)
- Computer Science (CS)
- Data and Decisions (DTDC)
- Economics (ECAS)
- Engineering Science and Mechanics (ESM)
- Entrepreneurship-New Venture Growth (ENVG)
- Environmental Policy and Planning (EPP)
- Geographic Information Science (GIS)
- Geosciences (GEOS)
- Green Engineering (GREN)
- Industrial Design (IDS)
- Mathematics (MATH)
- Public and Urban Affairs (PUA)
- Real Estate (REAL)
- Smart and Sustainable Cities (SSC)
- Statistics (STAT)
- Watershed Management (WSM)

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## Footnotes

<sup>1</sup> Career Bridge Experiences help prepare students for post-graduation life and develop a professional identity. Internships, Co-ops, and Undergraduate Research are examples of possible Career Bridge Experiences. Students must participate in a Career Bridge Experience to complete the BSCE degree. Because some of these experiences are not credit bearing, the ENGE 3900 course is used to track and assess student participation in Career Bridge and to record fulfillment of this degree requirement on the transcript. Students should enroll in ENGE 3900 during the semester (or one of the semesters) that they undertake the Career Bridge Experience. Enrollment in ENGE 3900 requires approval of a Career Bridge Plan.

Further information about acceptable Career Bridge Experiences and the process for submitting a Career Bridge Plan are explained in CEE 2804.

<sup>2</sup> Pathways courses can double count with any major requirements or elective requirements. They cannot double count with courses in the degree core.

<sup>3</sup> Design Project Course.

<sup>4</sup> Enrollment is on a space-available basis during drop-add.

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