Degree: Bachelor of Science in Civil Engineering
Major: Environmental Engineering
Program Requirements: *Catalog Year 2025-2026*

COLLEGE OF ENGINEERING
THE CHARLES E. VIA, JR. DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING
VIRGINIA TECH

ENVIRONMENTAL 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

The program curriculum provides the course requirements for Civil Engineering.

Pathways General Education Courses [2]

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

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Degree Core Courses

Course	Title	Credits	Prerequisites and Corequisites
☐ CEE 2834	Civil Engineering Drawings and Virtual Modeling	3	None
☐ CEE 2814	Geomatics	4	Pre: (ENGE 1216 or ENGE 1414); Co: CEE 2834
☐ CEE 3814	Analytical Tools in Civil & Environmental Engr.	3	Pre: CEE 3804
☐ CEE Fundamental Elective with Lab- CEE 3314: Water Resources Engineering		4	Pre: Varies
☐ CEE Fundamental Elective with Lab*		4	Pre: Varies
☐ CEE Fundamental Elective- CEE 3104: Introduction to Environmental Engineering		3	Pre: Varies
☐ CEE Fundamental Elective*		3	Pre: Varies
☐ CEE Fundamental Elective*		3	Pre: Varies
☐ CEE Fundamental Elective*		3	Pre: Varies
	Subtotal	**30**	

Major Required Courses

Course	Title	Credits	Prerequisites and Corequisites
☐ CHEM 1045	General Chemistry Lab	1	Co: CHEM 1035
☐ ESM 2104	Statics	3	Pre: MATH 1226; Co: MATH 2204
☐ ESM 2204	Mechanics of Deformable Bodies	3	Pre: ESM 2104, MATH 2204
☐ GEOS 2104	Elements of Geology	3	None
☐ ISE 2014	Engineering Economy	2	None
☐ MATH 2114	Introduction to Linear Algebra	3	Pre: MATH 1225 (B) or MATH 1226
☐ MATH 2204	Introduction to Multivariable Calculus	3	Pre: MATH 1226
☐ MATH 2214	Introduction to Differential Equations	3	Pre: MATH 1226, MATH 2114
☐ CEE Advanced Elective in Environmental Engineering*		3	Pre: Varies
☐ CEE Advanced Elective in Water Resources Engineering*		3	Pre: Varies
☐ CEE Advanced Elective in area other than Environmental and Water Resources Engineering*		3	Pre: Varies
☐ CEE Advanced Elective Design Project in Environmental or Water Resources Engineering*		3	Pre: Varies
☐ ENGE 3900 [1]	Career Bridge Experience [1]	0	None
	Subtotal	**33**	

*Fundamental and Advanced Program Electives course options can be found in the 2025-2026 Undergraduate Catalog.

Technical and 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
☐ CEE Technical Elective	3	Pre: Varies
☐ CEE Technical Elective	3	Pre: Varies
☐ Restricted Elective	3	Pre: Varies
☐ Restricted Elective	3	Pre: Varies
Subtotal	**12**	

Total Credits: 128

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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			
	Credits	**16**		**Credits**	**16**

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
	Credits	**15**		**Credits**	**16**

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 3104	Intro to Env. Egr. (Fundamental)	3	CEE 3314	Water Resources Engr. (Fund. w/ Lab)	4
CEE Fundamental Elective with Lab		4	CEE Fundamental Elective		3
Pathways	Concept 2, 3, 6a, or 7	3	CEE Fundamental Elective		3
	Credits	**16**		**Credits**	**16**

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.		
	Credits	**18**		**Credits**	**15**

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

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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		
CEE 3014	Construction Management (Fundamental)	3
CEE 4014	**Estimating, Production, and Cost Engineering** [3]	3
CEE 4024	Construction Control Techniques	3
CEE 4034	Smart Sustainable Infrastructure	3
CEE 4074	Construction Engineering: Means and Methods	3
Structural Engineering and Materials		
CEE 3404	Introduction to Structural Engineering (Fundamental)	3
CEE 3424	Reinforced Concrete Structures I	3
CEE 3434	**Design of Steel Structures I** [3]	4
CEE 4404	Intermediate Structural Analysis	3
CEE 4454	Masonry Structural Design	3
Environmental Engineering		
CEE 3104	Introduction to Environmental Engineering (Fundamental)	3
CEE 4104	**Water and Wastewater Treatment Design** [3]	3
CEE 4114	Fundamentals of Public Health Engineering	3
CEE 4134	Environmental Sustainability - A Systems Approach	3
CEE 4144	Air Resources Engineering	3
Materials		
CEE 3684	Civil Engineering Materials (Fundamental with lab)	4
CEE 4610	Mechanics of Composite Materials	3
CEE 4614	Concrete Materials	3
CEE 4634	Infrastructure Condition Assessment	3
CEE 4664	**Pavement Design** [3]	3
Land Development		
CEE 3274	Introduction to Land Development Design (Fundamental)	3
CEE 4264	Sustainable Land Development	3
CEE 4274	**Land Development Design** [3]	3
CEE 4284	Advanced Land Development Design	3
Geotechnical Engineering		
CEE 3514	Introduction to Geotechnical Engineering (Fundamental with lab)	4
CEE 4514	Methods in Geotechnical Engineering	3
CEE 4534	Earth Pressures and Foundation Structures	3
CEE 4544	**Design of Earth Structures** [3]	3
CEE 4564	Introduction to Coastal and Marine Geotechnics	3
Water Resources Engineering		
CEE 3314	Water Resources Engineering (Fundamental with lab)	4
CEE 4304	Hydrology	3
CEE 4314	Groundwater Resources	3

CEE 4324	Open Channel Flow	3
CEE 4334	**Hydraulic Structures** [3]	3
CEE 4344	Water Resources Planning	3
CEE 4364	**Geospatial Analysis and Hydrologic Design** [3]	3
CEE 4384	Coastal Engineering	3
CEE 4394	Urban Water Sustainability	3
Transportation Engineering		
CEE 3604	Introduction to Transportation Engineering (Fundamental)	3
CEE 4604	Traffic Engineering	3
CEE 4624	Planning Transportation Facilities	3
CEE 4654	**Geometric Design of Highways** [3]	3
CEE 4674	Airport Planning and Design	3
CEE 4684	Transportation Safety	3
CEE 4694	Freight Operations	3
Interdisciplinary Technical Electives, Independent Study, Undergraduate Research		
CEE 4554	Natural Disaster Mitigation and Recovery	3
CEE 4824	Introduction to Forensic Engineering	3
CEE 4844	Building Information Modeling and Integrated Practices	3
CEE 4974	Independent Study	1-19
CEE 4994	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.

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Restricted Electives

Study Abroad		
CEE 3954	Study Abroad	1-19
Programming		
CS 1044	Introduction to Programming in C	3
CS 1064	Introduction to Programming in Python	3
CS 1114	Introduction to Software Design	3
CS 2064	Intermediate Programming in Python	3
Statistics and Math		
MATH 3414	Numerical Methods	3
MATH 4564	Operational Methods for Engineers	3
STAT 4604	Statistical Methods for Engineers	3
Basic and Applied Science		
CHE 2114	Mass and Energy Balances	3
CHEM 1036	General Chemistry	3
PHYS 2306	Foundations of Physics	4
BIOL 1105	Principles of Biology	3
GEOS 3014	Environmental Geosciences	3
GEOG 3304	Geomorphology	3
GEOS 4634	Environmental Geochemistry	3
GEOS 4824	Engineering Geology	3
ME 2134	Thermodynamics [4]	4
BSE 3154	Thermodynamics of Biological Systems	3
Public Policy and Planning		
SPIA 2314	Active Transportation for a Healthy, Sustainable Planet	3
SPIA 2554	Collaborative Policy-Making and Planning	3
SPIA 3554	Transdisciplinary Problem Solving for Social Issues	3
SPIA 3704	Urban Contention and Mobilization	3
SPIA 4454	Future of Cities	3
SPIA 4464	Data and the Art of Policy-Making and Planning	3
UAP 3014	Urban Policy and Planning	3
UAP 3024	Urban and Regional Analysis	3
UAP 3224	Policy Implementation [4]	3
Sustainability, Environment, Climate Change		
GEOG 2244	Sustainable Urbanization	3
AAEC 3314	Environmental Law	3
BSE 3324	Small Watershed Hydrology	3
BSE 4224	Field Methods in Hydrology	3
CEM 3074	Global Design and Construction for Sustainable Development	3
FREC 2124	Forests, Society & Climate	3
FREC 4464	Water Resources Policy and Economics	3
FREC 4784	Wetland Hydrology and Biogeochemistry	3
ENGR 3124	Introduction to Green Engineering	3
ENGR 4134	Environmental Life Cycle Assessment	3
MINE 2114	Energy and Raw Materials: Geopolitics and Sustainable Development	3
SBIO 2504	Circular Economy Analytics for Sustainable Systems	3
UAP 3354	Introduction to Environmental Policy and Planning	3

UAP 4374	Land Use and Environment: Planning and Policy	3
Geographic Information Science		
BSE 4344	Geographic Information Systems for Engineers	3
GEOG 2084	Principles of Geographic Information Systems	3

Approved Minors

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

- Computer Science (CS)
- Data and Decisions (DTDC)
- Environmental Policy and Planning (EPP)
- Geographic Information Science (GIS)
- Geosciences (GEOS)
- Green Engineering (GREN)
- Mathematics (MATH)
- Public and Urban Affairs (PUA)
- Smart and Sustainable Cities (SSC)
- Statistics (STAT)
- Watershed Management (WSM)

Footnotes

[1] 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.

[2] Pathways courses can double count with any major requirements or elective requirements. They cannot double count with courses in the degree core.

[3] Design Project Course.

[4] Enrollment is on a space-available basis during drop-add.