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## Bachelor of CIVIL ENGINEERING (CVE)

4-Year Recommended Course Sequence with *Calculus Entry*

Updated April 2024

Click on the Course Name to access the course in the Undergraduate Catalog 23-24

Fall Semester 1	Spring Semester 2	Fall Semester 3	Spring Semester 4	Fall Semester 5	Spring Semester 6	Fall Semester 7	Spring Semester 8
ESC 120 [2] <a href="#">Intro to Engineering Design</a>	ESC 151 [3] <a href="#">C Programming</a> or ESC 152 [3] <a href="#">Program with MATLAB</a>	ESC 201 [3] <a href="#">Statics</a> (MTH 181 & PHY 241)	CVE 360 [4] <a href="#">Mechanics of Fluids and Thermal Systems</a> (ESC 250 & ESC 201)	CVE 312 [3] <a href="#">Structural Analysis</a> (ESC 211)	CVE 322 [3] <a href="#">Structural Steel Design</a> (CVE 312)	CVE 429 [3] <a href="#">Foundation Engineering</a> (CVE 331, CVE 332 & CVE 422)	CVE 427 [2] <a href="#">Capstone Design</a> (★★ See below for Prerequisites) (WAC)
★ ESC 100 [1] <a href="#">New Student Orientation</a>	**ESC 130 [1] <a href="#">Engineering Co-op Orientation</a>	CVE 211 [3] <a href="#">Surveying</a> (MTH 181)	ESC 211 [3] <a href="#">Strength of Materials</a> (ESC 201)	CVE 361 [3] <a href="#">Hydraulic Engineering</a> (ESC 301 or CVE 360)	CVE 331 [3] <a href="#">Intro to GeoTech Eng.</a> (ESC 211)	CVE 446 or CVE 546 [3] <a href="#">Transportation Eng.</a> (Senior Standing)	CVE 403 [3] <a href="#">Construction Planning</a> (Junior Standing)
CHM 261 [3] <a href="#">Gen. Chem. I</a> CHM 266 [1] <a href="#">Gen. Chem. I Lab</a>	PHY 241 [5] <a href="#">Physics I</a> (MTH 181)	CVE 212 [2] <a href="#">Surveying Lab</a> (*CVE 211)	CVE 310 [2] <a href="#">Strength of Materials Lab</a> (ESC 120 and *ESC 211)	CVE 362 [2] <a href="#">Hydraulics Lab</a> (CVE 360 or ESC 301 & *CVE 361)	CVE 332 [2] <a href="#">Geotechnical Engineering Lab</a> (*CVE 331)	CVE 426 [2] <a href="#">Preliminary Design</a> (*CVE 427 & ESC 282 or FIN 351) (WAC)	General Ed. Elective [3]
MTH 181 [4] <a href="#">Calculus I</a>	MTH 182 [4] <a href="#">Calculus II</a> (MTH 181)	PHY 242 [5] <a href="#">Physics II</a> (PHY 241 & MTH 182)	Geo 100 [3] <a href="#">Intro to Geology</a> Geo 101 [1] <a href="#">Intro to Geology Lab</a>	CVE 371 [3] <a href="#">Environmental Engineering 1</a> (CHM 261, CHM 266 & CVE 360)	CVE 461 or CVE 561 [3] <a href="#">Hydrologic Analysis</a> (CVE 361)	CVE Tech Elective [3] 300-400 Level	CVE Tech Elective [3] 300-400 Level
ENG 100 [3] <a href="#">Intensive Writing</a> or ENG 101 [3] <a href="#">College Writing I</a>	ESC 102 [3] <a href="#">Technical Writing</a> (Preferred)	ESC 250 [3] <a href="#">Diff EQ for Eng.</a> (MTH 182 – C or better) OR MTH 286 [3] <a href="#">Intro. to Diff EQ</a> (MTH 182 – C or better)	ESC 310 [3] <a href="#">Statistics and Probability</a> (MTH 182) OR STA 323 [3] <a href="#">Statistical Methods</a> (MTH 182)	CVE 374 [2] <a href="#">Environmental Engineering Lab</a> (CVE 360 or ESC 301, CHM 261, CHM 266 & *CVE 371)	CVE 422 [3] <a href="#">Reinforced Concrete Design</a> (CVE 312)	PHL 215 [3] <i>A&amp;H</i> <a href="#">Engineering Ethics</a> (ENG 102 or ESC 102) (WAC)	General Ed. Elective [3]
	CVE 170 [2] <a href="#">Civil Engineering Graphics</a>	MTH 283 [2] <a href="#">Multivariable Calculus For Engineers</a> (MTH 182 – C or better) OR MTH 281 [4] <a href="#">Multivariable Calculus</a> (MTH 182 – C or better)	MTH 284 [2] <a href="#">Matrices for Engineers</a> (MTH 182 – C or better) ONLY FOR MATH MINOR	ESC 202 [3] <a href="#">Dynamics</a> (ESC 201)	ESC 282 [3] <i>ss</i> <a href="#">Engineering Economy</a> (MTH 182)	General Ed. Elective [3]	General Ed. Elective [3]
14 Total Credit Hours	18 Total Credit Hours	18 Total Credit Hours	16 Total Credit Hours	16 Total Credit Hours	17 Total Credit Hours	17 Total Credit Hours	17 Total Credit Hours

Total Credits for CVE Degree: 131 including ESC 130 Engineering Co-op Orientation

(Prerequisites) • (\*Pre/co-requisite) • [# of Course Credits] • CVE XXX = Only Offered That Fall/Spring Semester

- Required CVE Courses \*\*Highly recommended, yet optional.
- Required Science Courses
- Required English Courses (ESC 102 is preferred. However, can be substituted with ENG 102.)
- Required Writing Across the Curriculum (WAC) Courses

- Required CVE 300-400 Level Courses
- Required Math Courses + STA 323 + MTH 284 to earn the Math Minor
- General Ed. Electives (2 A&Hs, 2 SSSs, 1 ALAAME, & 2 DIVs)

EASILY EARN A MATH MINOR AS A CVE MAJOR! [CLICK HERE TO LEARN HOW](#)

★ Must take ESC 100 (Exception of ASC 101 upon WCE Advisor Approval or special ASC 101 section.)

🕒 500-level courses that satisfy Undergraduate and Master's degree credits

★★ For students with Catalog Rights starting 2021 – Prerequisites for CVE 427 are:

CVE 426, CVE 211 AND 4 of 5: CVE 322, CVE 331, CVE 371, CVE 446, CVE 461

↓ [Scroll Down to View the Precalculus Entry 4-Year Plan Degree Chart](#) ↓

Begin to earn credits toward a Master's Degree while taking undergraduate courses!  
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# Bachelor of CIVIL ENGINEERING (CVE)

Updated April 2024

## 4-Year Recommended Course Sequence with *Precalculus Entry*

[CLICK HERE](#) to access Course Catalog Descriptions

Fall Semester 1	Spring Semester 2	Summer Semester #1	Fall Semester 3	Spring Semester 4	Summer Semester #2	Fall Semester 5	Spring Semester 6	Fall Semester 7	Spring Semester 8
ESC 120 [2] Intro to Engineering Design	Geo 100 [3] Intro to Geology (*GEO 101)		CVE 211 [3] Surveying (MTH 181)	ESC 201 [3] Statics (PHY 241)		CVE 361 [3] Hydraulic Analysis (CVE 360)	CVE 322 [3] Structural Steel Design (CVE 312)	CVE 426 [2] Preliminary Design (*CVE 427 & ESC 282 or FIN 351) (WAC)	CVE 427 [2] Capstone Design (★★ See below for Prereqs) (WAC)
★ ESC 100 [1] New Student Orientation	Geo 101 [1] Intro to Geology Lab (*GEO 100)		CVE 212 [2] Surveying Lab (*CVE 211)	ESC 151 [3] C Programming OR ESC 152 [3] Program w/ MATLAB (MTH 181)	CVE 360 Mechanics of Fluids & Therm. (ESC 201, ESC 250 or MTH 286) [4]	CVE 362 [2] Hydraulic Analysis Lab (CVE 360 & *CVE 361)	CVE 331 [3] Intro to Geotechnical Engineering (ESC 211)	CVE 429 [3] Foundation Eng. (CVE 331 and CVE 332 and CVE 422)	CVE 461 or CVE 561 [3] Hydrologic Analysis (CVE 361)
MTH 165 [3] Intensive Precalc I OR MTH 167 [3] Precalculus I	MTH 168 [3] Precalculus II (MTH 165 or MTH 167)		PHY 241 [5] Physics I (MTH 181)	PHY 242 [5] Physics II (PHY 241 & MTH 182)		ESC 202 [3] Dynamics (ESC 201 and *ESC 211)	CVE 332 [2] Geotechnical Engineering Lab (*CVE 331)	CVE 446 or CVE 546 [3] Transportation Engineering (Senior Standing)	CVE 403 [3] Construction Planning (Junior Standing)
ENG 100 [3] Intensive Writing OR ENG 101 [3] College Writing I	ESC 102 [3] Technical Writing (Preferred)	OPSTEM MTH 180 SUMMER CALCULUS I (Average B- or better in MTH 167&168) [4]	CHM 261 [3] Gen. Chem. I CHM 266 [1] Gen. Chem I Lab (MTH 168)	MTH 286 [3] Intro. to Diff EQ (MTH 182 – C or better) or ESC 250 [3] Diff EQ for Eng. (MTH 182 – C or better)		CVE 374 [2] Environmental Engineering Lab (CVE 360 and *CVE 371)	CVE 310 [2] Strength of Materials Lab (ESC 120 and *ESC 211)	STA 323 [3] Statistical Methods (MTH 182) or ESC 310 [3] Statistics and Probability (MTH 182)	CVE Tech Elective [3] 300-400 Level
General Ed. Elective [3]	CVE 170 [2] Civil Engineering Graphics		MTH 182 [4] Calculus II (MTH 181)	MTH 283 [2] Multivariable Calculus For Engineers (MTH 182 – C or better) OR MTH 281 [4] Multivariable Calculus (MTH 182 – C or better)	ESC 211 Strength of Materials (ESC 201, *ESC 202) [3]	CVE 371 [3] Environmental Engineering (CVE 360)	CVE 422 [3] Reinforced Concrete Design (CVE 312)	PHL 215 [3] A&H Engineering Ethics (ENG 102 or ESC 102) (WAC)	General Ed. Elective [3]
General Ed. Elective [3]	General Ed. Elective [3]			**ESC 130 [1] Engineering Co-op Orientation		CVE 312 [3] Structural Analysis (ESC 211)	ESC 282 [3] SS Engineering Economy (MTH 182)	CVE Tech Elective [3] 300-400 Level	OR HERE
15 Total Credit Hours	15 Total Credit Hours	4 Total Credit Hours	18 Total Credit Hours	17 Total Credit Hours	7 Total Credit Hours	16 Total Credit Hours	16 Total Credit Hours	14 or 17 Total Credit Hours	14 or 17 Total Credit Hours

**Total Credits for CVE Degree: 137 including ESC 130 Engineering Co-op Orientation**

(Prerequisites) • (\*Pre/co-requisite) • [# of Course Credits] • CVE XXX = Only Offered That Fall/Spring Semester

- Required CVE Courses \*\*Highly recommended, yet optional.
- Required Science Courses
- Required English Courses (ESC 102 is preferred. However, can be substituted with ENG 102.)
- Required Writing Across the Curriculum (WAC) Courses
- Required CVE 300-400 Level Courses
- Required Math Courses + STA 323 + MTH 284 to earn the Math Minor
- General Ed. Electives (2 A&Hs, 2 SSs, 1 ALAAME, & 2 DIVs)

**EASILY EARN A MATH MINOR AS A CVE MAJOR! [CLICK HERE TO LEARN HOW](#)**

★ Must take ESC 100 (Exception of ASC 101 upon WCE Advisor Approval or special ASC 101 section.)

★★ For students with Catalog Rights starting 2021 – Prerequisites for CVE 427 are: CVE 426, CVE 211 AND 4 of 5: CVE 322, CVE 331, CVE 371, CVE 446, CVE 461

🕒 500-level courses that satisfy Undergraduate and Master's degree credits

↓ [Scroll Down to View the Precalculus Entry 5-Year Plan Degree Chart](#) ↓

Begin to earn credits toward a Master's Degree while taking undergraduate courses!

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## Bachelor of CIVIL ENGINEERING (CVE)

Updated April 2024

### 5-Year Recommended Course Sequence with *Precalculus Entry*

[CLICK HERE](#) to access Course Catalog Descriptions

Fall Semester 1	Spring Semester 2	Summer Semester 1	Fall Semester 3	Spring Semester 4	Fall Semester 5	Spring Semester 6	Fall Semester 7	Spring Semester 8	Fall Semester 9	Spring Semester 10
ESC 120 [2] Intro to Engineering Design	Geo 100 [3] Intro to Geology (*GEO 101)	Summer Semester 1  OPSTEM MTH 180 SUMMER CALCULUS I (Average B- or better in MTH 167&168) [4]	CVE 211 [3] Surveying (MTH 181)	ESC 201 [3] Statics (PHY 241)	ESC 211 [3] Strength of Materials (ESC 201 and *ESC 202)	CVE 360 [4] Mechanics of Fluids & Thermo. (ESC 250 or MTH 286 and ESC 201)	CVE 361 [3] Hydraulic Analysis (CVE 360)	CVE 322 [3] Structural Steel Design (CVE 312)	CVE 429 [3] Foundation Eng. (CVE 331 and CVE 332 and CVE 422)	CVE 427 [2] Capstone Design (★★ See below for Prereqs) (WAC)
★ESC 100 [1] New Student Orientation	Geo 101 [1] Intro to Geology Lab (*GEO 100)		CVE 212 [2] Surveying Lab (*CVE 211)	*CHM 261 [3] Gen. Chem. I CHM 266 [1] Gen. Chem. I Lab (MTH 168)	ESC 202 [3] Dynamics (ESC 201 and *ESC 211)	CVE 331 [3] Intro to Geotechnical Eng. (ESC 211)	CVE 362 [2] Hydraulic Analysis Lab (CVE 360 and *CVE 361)	CVE 461 [3] Hydrologic Analysis (CVE 361)	CVE 446 [3] Transportation Eng. (Senior Standing)	CVE 403 [3] Construction Planning (Junior Standing)
MTH 165 [3] Intensive Precalc I OR MTH 167 [3] Precalculus I	MTH 168 [3] Precalculus II (MTH 165 or MTH 167)		MTH 182 [4] Calculus II (MTH 181)	ESC 151 [3] C Programming or ESC 152 [3] Program w/ MATLAB (MTH 181)	PHY 242 [5] Physics II (PHY 241 and MTH 182)	CVE 332 [2] Geotechnical Eng. Lab (*CVE 331)	CVE 312 [3] Structural Analysis (ESC 211)	CVE 422 [3] Reinforced Concrete Design (CVE 312)	CVE 426 [2] Preliminary Design (*CVE 427 & ESC 282 or FIN 351) (WAC)	PHL 215 [3] A&H Engineering Ethics (ENG 102 or ESC 102)
ENG 100 [3] Intensive Writing or ENG 101 [3] College Writing I	ESC 102 [3] Technical Writing (Preferred)		PHY 241 [5] Physics I (MTH 181)	MTH 286 [3] Intro. to Diff EQ (MTH 182 -C or better) or ESC 250 [3] Diff EQ for Eng. (MTH 182 -C or better)	General Ed. Elective [3]	STA 323 [3] Statistical Methods (MTH 182) or ESC 310 [3] Statistics and Probability (MTH 182)	CVE 371 [3] Environmental Eng. (CVE 360)	CVE 310 [2] Strength of Materials Lab (ESC 120 and *ESC 211)	General Ed. Elective [3]	CVE Tech Elective [3] 300-400 Level
General Ed. Elective [3]	CVE 170 [2] Civil Engineering Graphics		**ESC 130 [1] Engineering Co-op Orientation	MTH 283 [2] Multivariable Calculus (MTH 182 -C or better) OR MTH 284 [2] Matrices for Engineers (MTH 182 -C or better)	General Ed. Elective [3]	General Ed. Elective [3]	CVE 374 [2] Env. Eng. Lab (CVE 360 and *CVE 371)	ESC 282 [3] SS Engineering Economy (MTH 182)	ADD A 1 CREDIT PES COURSE OR AN INDEPENDENT STUDY	CVE Tech Elective [3] 300-400 Level
12 Total Credit Hours	12 Total Credit Hours	4 Total Credit Hrs	15 Total Credit Hours	15 Total Credit Hours	14 Total Credit Hours	15 Total Credit Hours	13 Total Credit Hours	14 Total Credit Hours	12 Total Credit Hours	14 Total Credit Hours

Total Credits for CVE Degree: 137 including ESC 130 Engineering Co-op Orientation

(Prerequisites) • (\*Pre/co-requisite) • [# of Course Credits] • CVE XXX = Only Offered That Fall/Spring Semester

- Required CVE Courses \*\*Highly recommended, yet optional.
- Required Science Courses
- Required English Courses (ESC 102 is preferred. However, can be substituted with ENG 102.)
- Required Writing Across the Curriculum (WAC) Courses

- Required CVE 300-400 Level Courses
  - Required Math Courses + STA 323 + MTH 284 to earn the Math Minor
  - General Ed. Electives (2 A&Hs, 2 SSs, 1 ALAAME, & 2 DIVs)
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📍 500-level courses that satisfy Undergraduate and Master's degree credits

★★ For students with Catalog Rights starting 2021 – Prerequisites for CVE 427 are:

CVE 426, CVE 211 AND 4 of 5: CVE 322, CVE 331, CVE 371, CVE 446, CVE 461

↓ Be sure to select a course listed below that qualifies for two (2) General Ed. Electives. ↓

Updated Spring 2024

To eliminate one (1) of your General Education Requirements,  
consider taking a course that qualifies as two (2) General Ed. Electives

Recommended Courses that Qualify as Two (2) General Ed. Electives

Course	Social Sciences (SS)	Arts & Humanities (AH)	Non-Western Social Sciences (ALAAME & NW-SS)
<a href="#">ANT 153 – Intro to African Cultures</a>	X		X
<a href="#">ANT 275 – Ancient Mysteries</a>	X		X
<a href="#">COM 201 – Com &amp; Relationships / East Asian</a>	X		X
<a href="#">COM 233 – Bollywood &amp; Beyond</a>	X		X
<a href="#">HIS 103 – Ancient World His to 1300 C.E.</a>	X		X
<a href="#">HIS 104 – Modern World History</a>	X		X
<a href="#">SOC 210 – Dev. Societies in Changing World</a>	X		X
<a href="#">UST 206 – Megacities of Asia</a>	X		X
<a href="#">UST 222 – World Population and Society</a>	X		X
<a href="#">ANT 103 – Rise/Fall of Civilizations</a>		X	X
<a href="#">ANT 171 – Native Civilization of Americas</a>		X	X
<a href="#">ARB 274 – Introduction to Middle East</a>		X	X
<a href="#">ART 281 – Asian Art</a>		X	X
<a href="#">ART 286 – African Art</a>		X	X
<a href="#">ENG 204 – World Literature</a>		X	X
<a href="#">HIS 165 – Intro to Latin American History</a>		X	X
<a href="#">HIS 175 – Intro to African History</a>		X	X
<a href="#">HIS 185 – Survey of Middle Eastern History</a>		X	X
<a href="#">HIS 195 – Intro to East Asian History</a>		X	X
<a href="#">MUS 263 – Black Music of Two Worlds</a>		X	X
<a href="#">PHL 255 – Non-Western Philosophy</a>		X	X
<a href="#">PHL 262 – Medieval Philosophy</a>		X	X
<a href="#">REL 101 – Understanding Religion</a>		X	X
<a href="#">REL 268 – Religion &amp; Culture in Africa</a>		X	X
<a href="#">WLC 265 – Francophone Lit in Translation</a>		X	X

Popular Introductory General Ed.  
Courses for Engineering Students

**SOCIAL SCIENCES (SS)**

[PSY 220 – Child Development](#) (SS)

[UST 200 – Intro to Urban Studies](#) (SS)

[COM 233 – Bollywood & Beyond](#) (SS & ALAAME)

**ARTS & HUMANITIES (AH)**

[MUS 161 – Roots of Rock & Soul](#) (AH)

[UST 201 – Building Cleveland](#) (AH)

[REL 101 – Understanding Religion](#) (AH & ALAAME)

[MUS 263 – Black Music of Two Worlds](#) (AH & ALAAME)

[ANT 171 – Native Civilization of America](#) (AH & ALAAME)

**US DIVERSITY (US DIV)**

[ANT 100 – Human Diversity](#) (US DIV)

[SOC 201 – Race/Class/Gender](#) (US DIV)

**AFRICAN-AMERICAN (AFRICAN-AMER.)**

[SWK 150 – The Black Experience](#) (African- Amer.)

[UST 202 – Cleveland: The Afr-Amer Exp.](#) (African-Amer.)