

Begin to earn credits toward a **COMPUTER SCIENCE** Master's Degree while taking undergraduate courses! [CLICK HERE](#)

## Bachelor of COMPUTER ENGINEERING (CE)

Updated July 2024

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

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="#">Introduction to Engineering Design</a>	ESC 151 [3] <a href="#">C Programming</a>	CIS 260 [4] <a href="#">Intro to Programming</a> (ESC 151 or CIS 151)	CIS 265 [4] <a href="#">Data Structures &amp; Algorithms</a> (CIS 260 and MTH 181)	CIS 340 [3] <a href="#">Systems Programming</a> (CIS 265 and MTH 181)	CIS 345 or CIS 545 [3] <a href="#">Operating Systems</a> (CIS 265 and MTH 181)	EEC 493 [2] <a href="#">Senior Design I</a> (*CIS 454 or *EEC 487 or *EEC 484)	EEC 494 [3] <a href="#">Senior Design II</a> (EEC 493)
CHM 261 [3] <a href="#">Gen. Chem. I</a> CHM 266 [1] <a href="#">Gen. Chem I Lab</a>	ESC 102 [3] <a href="#">Technical Writing</a> (Preferred)	EEC 310 [4] <a href="#">Circuits I</a> (*ESC 120, *MTH 284, & *PHY 244)	EEC 311 [4] <a href="#">Circuits II</a> (EEC 310 – C or better)	EEC 313 [3] <a href="#">Electronics I</a> (EEC 310)	EEC 316 [1] <a href="#">Electronic Devices Lab</a> (EEC 311 & EEC 313)	EEC 488 or EEC 587 [3] <a href="#">HW-SW Codesign</a> (*EEC 487 and *CIS 340)	EEC 483 or EEC 581 [3] <a href="#">Computer Organization</a> (EEC 384 & CIS 265)
General Ed. Elective [3]	PHY 243 [5] <a href="#">Physics I</a> (MTH 181) (WAC)	EEC 383 [3] <a href="#">Digital Systems</a> (*EEC 310 or *PHY 244)	EEC 384 [2] <a href="#">Digital Systems Laboratory</a> (EEC 383)	EEC 487 or EEC 580 [3] <a href="#">Advanced Digital Systems</a> (EEC 384)	EEC/CIS Tech Elective [3] 300-400 Level	CIS 454 or CIS 584 [3] <a href="#">Computer Networks</a> (CIS 340)	EEC/CIS Tech Elective [3] 300-400 Level
MTH 181 [4] <a href="#">Calculus I</a>	MTH 182 [4] <a href="#">Calculus II</a> (MTH 181)	MTH 220 [3] <a href="#">Discrete Math</a> (MTH 182 - C or better)	PHY 244 [5] <a href="#">Physics II</a> (PHY 243) (WAC)	MTH 283 [2] <a href="#">Multivariable Calculus</a> (MTH 182 – C or better) OR MTH 284 [2] <a href="#">Matrices for Engineers</a> (MTH 182 – C or better)	STA 323 [3] <a href="#">Statistical Methods</a> (MTH 182) OR ESC 310 [3] <a href="#">Statistics and Probability</a> (MTH 182)	EEC/CIS Tech Elective [3] 300-40 Level	EEC/CIS Tech Elective [3] 300-400 Level
ENG 100 [3] <a href="#">Intensive Writing</a> or ENG 101 [3] <a href="#">College Writing I</a>		MTH 286 [3] <a href="#">Intro. to Diff EQ</a> (MTH 182 – C or better) OR ESC 250 [3] <a href="#">Diff EQ for Eng.</a> (MTH 182 – C or better)	**ESC 130 [1] <a href="#">Engineering &amp; Computer Science Career Preparation</a>	PHL 215 [3] A&H <a href="#">Engineering Ethics</a> (ENG 102 or ESC 102) (WAC)	EEC 414 [2] <a href="#">Writing in ECE</a> (PHL 215) (WAC)	General Ed. Elective [3]	General Ed. Elective [3]
★ ESC 100 [1] <a href="#">New Student Orientation</a>				General Ed. Elective [3]	ESC 282 [3] SS <a href="#">Engineering Economy</a> (MTH 182)		
17 Total Credit Hours	15 Total Credit Hours	17 Total Credit Hours	16 Total Credit Hours	17 Total Credit Hours	15 Total Credit Hours	14 Total Credit Hours	15 Total Credit Hours

**Total Credits for CE Degree: 126 including ESC 130 Engineering Co-op Orientation**

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

- Required BCE 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

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

- Required BCE 300-400 Level Electives
- Required Math Courses Substitute MTH 286 for ESC 250 to add Math Minor
- Ed. Electives (2 A&Hs, 2 Ss, 1 ALAAME, & 2 DIVs)

**EASILY EARN A MATH MINOR AS A CE MAJOR! [CLICK HERE TO LEARN HOW](#)**  
**EARN AN AUTOMATIC COMPUTER SCIENCE MINOR! [CLICK HERE TO LEARN HOW](#)**  
**500-level Courses that satisfy Undergraduate and Master's degree credits**

Begin to earn credits toward a **COMPUTER SCIENCE** Master's Degree while taking undergraduate courses! [CLICK HERE](#)

Updated July 2024

## Bachelor of COMPUTER ENGINEERING (CE)

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

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

Scroll Down to View the Precalculus Entry 4-Year Plan Degree Chart

Fall Semester 1	Spring Semester 2		Fall	Spring	Fall	Spring Semester 6	Fall Semester 7	Spring Semester 8
ESC 120 [2] <a href="#">Intro to Engineering Design</a>	ESC 102 [3] <a href="#">Technical Writing</a> (Preferred)	Summer Semester #1	CIS 260 [4] <a href="#">Intro to Programming</a> (ESC 151 or CIS 151)	CIS 265 [4] <a href="#">Data Structures and Algorithms</a> (CIS 260 and MTH 181)	EEC 311 [4] <a href="#">Circuits II</a> (EEC 310 – C or better)	CIS 345 or CIS 545 [3] <a href="#">Operating Systems</a> (CIS 340)	EEC 493 [2] <a href="#">Senior Design I</a> (*CIS 454 or *EEC 487 or *EEC 484)	EEC 494 [3] <a href="#">Senior Design II</a> (EEC 493)
ENG 100 [3] <a href="#">Intensive Writing</a> or ENG 101 [3] <a href="#">College Writing I</a>	General Ed. Elective [3]	ESC 151 [3] <a href="#">C Program.</a> (MTH 168)	PHY 243 [5] Physics I (MTH 181) (WAC)	EEC 310 [4] <a href="#">Circuits I</a> (*ESC 120, *MTH 284, & *PHY 244)	EEC 313 [3] <a href="#">Electronics I</a> (EEC 310)	EEC 316 [1] <a href="#">Elec Devices Lab</a> (EEC 311 & EEC 313)	CIS 454 or CIS 584 [3] <a href="#">Data Comm. &amp; Networking</a> (CIS 340)	EEC 483 or EEC 581 [3] <a href="#">Comp. Organization</a> (EEC 384 & CIS 265)
★ESC 100 [1] <a href="#">New Student Orientation</a>	General Ed. Elective [3]		MTH 182 [4] <a href="#">Calculus II</a> (MTH 181)	PHY 244 [5] Physics II (PHY 243) (WAC)	EEC 383 [3] <a href="#">Digital Systems</a> (*EEC 310 or *PHY 243)	PHL 215 [3] A&H <a href="#">Engineering Ethics</a> (ENG 102 or ESC 102) (WAC)	EEC/CIS Tech Elective [3] 300-400 Level	EEC/CIS Tech Elective [3] 300-400 Level
MTH 165 [3] <a href="#">Intensive Precalc I</a> OR MTH 167 [3] <a href="#">Precalculus I</a>	MTH 168 [3] <a href="#">Precalculus II</a> (MTH 165 or MTH 167)	OPSTEM MTH 180 SUMMER CALCULUS I [4] (Average B- or better in MTH 167&168)	CHM 261 [3] <a href="#">Gen. Chem. I</a> CHM 266 [1] <a href="#">Gen. Chem. I Lab</a> (MTH 168)	MTH 286 [3] <a href="#">Intro. to Diff EQ</a> (MTH 182 – C or better) OR ESC 250 [3] <a href="#">Diff EQ for Eng.</a> (MTH 182 – C or better)	CIS 340 [3] <a href="#">Systems Programming</a> (CIS 265)	STA 323 [3] <a href="#">Statistical Methods</a> (MTH 182) OR ESC 310 [3] <a href="#">Statistics and Probability</a> (MTH 182)	EEC/CIS Tech Elective [3] 300-400 Level	EEC/CIS Tech Elective [3] 300-400 Level
General Ed. Elective [3]			**ESC 130 [1] <a href="#">Engineering Co-op Orientation</a>	MTH 283 [2] <a href="#">Multivariable Calculus</a> (MTH 182 – C or better) OR MTH 284 [2] <a href="#">Matrices for Engineers</a> (MTH 182 – C or better)	MTH 220 [3] <a href="#">Discrete Math</a> (MTH 182 -C or better)	EEC 384 [2] <a href="#">Digital Sys Lab</a> (EEC 383)	EEC 487 or EEC 580 [3] <a href="#">Advanced Digital Sys</a> (EEC 384)	EEC 414 [2] <a href="#">Writing in ECE</a> (PHL 215) (WAC)
General Ed. Elective [3]						ESC 282 [3] SS <a href="#">Engineering Economy</a> (MTH 182)	EEC 488 or EEC 587 [3] <a href="#">HW-SW Codesign</a> (*EEC 487 and *CIS 340)	
15 Total Credit Hours	12 Total Credit Hours	4 Total Credit Hrs	18 Total Credit Hours	18 Total Credit Hours	16 Total Credit Hours	15 Total Credit Hours	17 Total Credit Hours	14 Total Credit Hours

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

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

- Required BCE 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 BCE 300-400 Level Electives
- Required Math Courses Substitute MTH 286 for ESC 250 to add Math Minor
- [General Ed. Electives \(2 A&Hs, 2 Ss, 1 ALAAME, & 2 DIVs\)](#)

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**EARN AN AUTOMATIC COMPUTER SCIENCE MINOR! [CLICK HERE TO LEARN HOW](#)**

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

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

↓ Scroll Down to View the Precalculus Entry 5-Year Plan Degree

Begin to earn credits toward a **COMPUTER SCIENCE** Master's Degree while taking undergraduate courses! [CLICK HERE](#)

Updated July 2024

## Bachelor of COMPUTER ENGINEERING (CE)

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

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

Fall Semester 1	Spring Semester 2	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] <a href="#">Intro to Engineering Design</a>	General Ed. Elective [3]	ESC 151 [3] <a href="#">C Program.</a> (MTH 168)	PHY 243 [5] Physics I (MTH 181) (WAC)	PHY 244 [5] Physics II (PHY 243) (WAC)	CIS 265 [4] <a href="#">Data Structures and Algorithms</a> (CIS 260 and MTH 181)	CIS 340 [3] <a href="#">Systems Programming</a> (CIS 265)	CIS 345 or CIS 545 [3] <a href="#">Operating Systems</a> (CIS 340)	EEC 493 [2] <a href="#">Senior Design</a> ↓ (*CIS 454 or *EEC 487 or *EEC 484)	EEC 494 [3] <a href="#">Senior Design II</a> (EEC 493)
General Ed. Elective [3]	ESC 102 [3] <a href="#">Technical Writing</a> (Preferred)	MTH 181 [4] <a href="#">Calculus I</a> (MTH 168)	MTH 182 [4] <a href="#">Calculus II</a> (MTH 181)	MTH 286 [3] <a href="#">Intro. to Diff EQ</a> (MTH 182 – C or better) OR ESC 250 [3] <a href="#">Diff EQ for Eng.</a> (MTH 182 – C or better)	EEC 310 [4] <a href="#">Circuits I</a> (*ESC 120, *MTH 284, and *PHY 244)	EEC 313 [3] <a href="#">Electronics I</a> (EEC 310)	EEC 316 [1] <a href="#">Electronic Devices Lab</a> (EEC 311 and EEC 313)	EEC 488 or EEC 587 [3] <a href="#">HW-SW Codesign</a> (*EEC 487 and *CIS 340)	EEC 483 or EEC 581 [3] <a href="#">Computer Organization</a> (EEC 384 and CIS 265)
★ ESC 100 [1] <a href="#">New Student Orientation</a>	General Ed. Elective [3]	CHM 261 [3] <a href="#">Gen. Chem. I</a> CHM 266 [1] <a href="#">Gen. Chem. I Lab</a> (MTH 168)	CIS 260 [4] <a href="#">Intro to Programming</a> (ESC 151 or CIS 151)	MTH 220 [3] <a href="#">Discrete Math</a> (MTH 182 -C or better)	EEC 383 [3] <a href="#">Digital Systems</a> (*EEC 310 or *PHY 244)	EEC 311 [4] <a href="#">Circuits II</a> (EEC 310 – C or better)	EEC/CIS Tech Elective [3] 300-400 Level	CIS 454 or CIS 584 [3] <a href="#">Data Comm. &amp; Networking</a> (CIS 340)	EEC/CIS Tech Elective [3] 300-400 Level
MTH 165 [3] <a href="#">Intensive Precalc</a> ↓ OR MTH 167 [3] <a href="#">Precalculus I</a>	MTH 168 [3] <a href="#">Precalculus II</a> (MTH 165 or MTH 167)	General Ed. Elective [3]	**ESC 130 [1] <a href="#">Engineering Co-op Orientation</a>	PHL 215 [3] A&H <a href="#">Engineering Ethics</a> (ENG 102 or ESC 102) (WAC)	ESC 282 [3] ss <a href="#">Engineering Economy</a> (MTH 182)	MTH 283 [2] <a href="#">Multivariable Calculus</a> (MTH 182 – C or better) OR MTH 284 [2] <a href="#">Matrices for Engineers</a> (MTH 182 – C or better)	STA 323 [3] <a href="#">Statistical Methods</a> (MTH 182) OR ESC 310 [3] <a href="#">Statistics and Probability</a> (MTH 182)	EEC/CIS Tech Elective [3] 300-400 Level	EEC/CIS Tech Elective [3] 300-400 Level
ENG 100 [3] <a href="#">Intensive Writing</a> or ENG 101 [3] <a href="#">College Writing I</a>							EEC 384 [2] <a href="#">Digital Systems Lab</a> (EEC 383)	EEC 487 or EEC 580 [3] <a href="#">Advanced Digital Systems</a> (EEC 384)	EEC 414 [2] <a href="#">Writing in ECE</a> (PHL 215) (WAC)
12 Total Credit Hours	12 Total Credit Hours	14 Total Credit Hours	14 Total Credit Hours	14 Total Credit Hours	14 Total Credit Hours	12 Total Credit Hours	12 Total Credit Hours	14 Total Credit Hours	14 Total Credit Hours

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

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

- Required BCE Courses \*\*Highly recommended, yet optional.
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Ⓢ 500-level courses that satisfy Undergraduate and Master's degree credits

↓ Be Sure to Select a Course Listed Below that Qualifies for Two (2) General Ed. Electives ↓

**List of CE undergraduate courses  
that satisfy COMPUTER SCIENCE Master's Degree credits**

Course Number & Name
<a href="#">CIS 390   CIS 550: Introduction to Algorithms</a>
<a href="#">CIS 345   CIS 545: Operating Systems</a>
<a href="#">CIS 454   CIS 584: Computer Networks</a>
<a href="#">CIS 430   CIS 530: Database Concepts</a>
<a href="#">EEC 417   EEC 517: Embedded Systems</a>
<a href="#">EEC 430   EEC 530: Digital Signal Processing</a>
<a href="#">EEC 473   EEC 571: Power Systems</a>
<a href="#">EEC 487   EEC 580: Advanced Digital Systems</a>
<a href="#">EEC 488   EEC 587: Hardware-Software Co-Design</a>
<a href="#">EEC 456   EEC 556: Software Defined Radio</a>
<a href="#">EEC 457   EEC 557: Modern Applications of Digital Communications</a>
<a href="#">EEC 460   EEC 560: Engineer Electromagnetics</a>
<a href="#">EEC 483   EEC 581: Computer Organization</a>

Access CampusNet to check when courses are offered each semester!

Updated July 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 (FALL ONLY)</a>	X		X
<a href="#">ANT 275 – Ancient Mysteries</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="#">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 (SPRING ONLY)</a>		X	X
<a href="#">ART 281 – Asian Art</a>		X	X
<a href="#">ART 286 – African Art</a>		X	X
<a href="#">HIS 165 – Intro to Latin American History (SPRING ONLY)</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 (SPRING ONLY)</a>		X	X
<a href="#">REL 101 – Understanding Religion</a>		X	X
<a href="#">REL 268 – Religion &amp; Culture in Africa (FALL ONLY)</a>		X	X

**Popular Introductory General Ed.  
Courses for Engineering Students**

**SOCIAL SCIENCES (SS)**

- [PSY 220 – Child Development \(SS\)](#)
- [UST 200 – Cleveland: The City \(SS\)](#)
- [COM 233 – Bollywood & Beyond \(SS & ALAAME\)](#)
- [HIS 103 – Ancient World His. to 1300 C.E. \(SS & ALAAME\)](#)

**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 \(AH & ALAAME\)](#)

**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. \(African-Amer.\)](#)