

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





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Bachelor of COMPUTER SCIENCE (CS)

Updated May 2024





4-Year Recommended Course Sequence with *Calculus Entry*


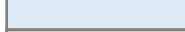

Click on the Course Name to access the course in the Undergraduate Catalog 23-24

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] Intro to Engineering Design	CIS 260 [4] Intro to Programming (ESC 151 or CIS 151)	CIS 265 [4] Data Structures and Algorithms (CIS 260 & MTH 181)	CIS 335 [3] Language Processors (CIS 265)	CIS 340 [3] Systems Programming (CIS 265)	CIS 345 CIS 545 [3] Operating Systems (CIS 340)	CIS 493 [2] Senior Design I (*CIS 345)	CIS 494 [3] Senior Design II (CIS 493)
CIS 151 [3] Invitation to Computing	PHY 243 [5] Physics I (MTH 181) (WAC)	MTH 220 [3] Discrete Math (MTH 182 -C or better)	MTH 288 [3] Linear Algebra (MTH 182 and ESC 152) or ESC 350 [3] Linear Algebra for Engineers	EEC 414 [2] Writing in ECE (PHL 215) (WAC)	CIS 454 CIS 584 [3] Computer Networks (CIS 340)	CIS 475 [3] Computer Security (CIS 340)	General Ed. Elective [3]
ENG 100 [3] Intensive Writing or ENG 101 [3] College Writing I	ESC 102 [3] Technical Writing (Preferred)	STA 323 [3] Statistical Methods (MTH 182) or ESC 310 [3] Statistics and Probability (MTH 182)	PHL 215 [3] <i>A&H</i> Engineering Ethics (ENG 102 or ESC 102) (WAC) OR PHL 216 [3] <i>A&H</i> Data Ethics (WAC)	CIS 390 CIS 550 [3] Introduction to Algorithms (CIS 265 & MTH 220)	CIS 434 [3] Software Engineering (CIS 265)	<p>Suggested Technical Elective Courses (9 credits per semester)</p> <p>EEC 383 (*EEC 310 or *PHY 243) Digital Sys [3] EEC 384 (EEC 383) Digital Systems Lab [2] CIS 368 (CIS 265) Object-Oriented Design/Program [3] CIS 408 (CIS 265) Internet Program. [3] CIS 457 (CIS 368) Computer Graphics [3] CIS 465 (CIS 368) Multimedia [3] CIS 467 (CIS 390) Artificial Intelligence [3] CIS 470 (CIS 340) Mobile App Dev. [3]</p> <p>CIS 490 (MTH 220, CIS 335)  Foundations of Computing [3] EEC 487 (EEC 384)  Advanced Digital Systems [3] EEC 488 (*EEC 487, *CIS 340)  Hardware-Software Co-Design [3]</p>	
MTH 181 [4] Calculus I	MTH 182 [4] Calculus II (MTH 181)	PHY 244 [5] Physics II (PHY 243) (WAC)	ESC 282 [3] <i>SS</i> Engineering Economy (MTH 182)	CIS 424 [3] Comparative Programming Languages (CIS 265)	CIS 430 CIS 530 [3] Database Concepts (CIS 265)		
★ ESC 100 [1] New Student Orientation		**ESC 130 [1] Engineering Co-op Orientation	General Ed. Elective [3]	CIS 480 CIS 580 [3]  Intro to Comp Architecture (CIS 335)	General Ed. Elective [3]		
				General Ed. Elective [3]			
13 Total Credit Hours	16 Total Credit Hours	16 Total Credit Hours	15 Total Credit Hours	17 Total Credit Hours	15 Total Credit Hours		

Total Credits for CS Degree: 120 or 121 including ESC 130 Engineering Co-op Orientation

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

-  Required CIS 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 CIS 300-400 Level Electives
-  Required Math Courses + MTH 283 to claim 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](#)

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

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

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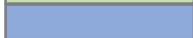


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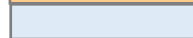
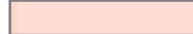
4-Year Recommended Course Sequence with *Precalculus Entry*

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

Fall Semester 1	Spring Semester 2	Summer Semester #1	Fall Semester 3	Spring Semester 4	Fall Semester 5	Spring Semester 6	Summer Semester #2	Fall Semester 7	Spring Semester 8
ESC 120 [2] Intro to Engineering Design	CIS 151 [3] Invitation to Computing		CIS 260 [4] Intro to Programming (ESC 151 or CIS 151)	CIS 265 [4] Data Structures and Algorithms (CIS 260 and MTH 181)	CIS 340 [3] Systems Programming (CIS 265)	CIS 345 CIS 545 [3] Operating Systems (CIS 340)		CIS 493 [2] Senior Design I (*CIS 345)	CIS 494 [3] Senior Design II (CIS 493)
General Ed. Elective [3]	General Ed. Elective [3]	OPSTEM MTH 180 SUMMER CALCULUS I [4] (Average B- or better in MTH 167&168)	MTH 182 [4] Calculus II (MTH 181)	MTH 288 [3] Linear Algebra (MTH 182 and ESC 152) OR ESC 350 [3] Linear Algebra for Engineers	CIS 335 [3] Language Processors (CIS 265 and MTH 181)	CIS 480 CIS 580 [3] Intro. to Computer Architecture (CIS 335)	CIS 475 [3] Computer Security (CIS 340)	Suggested Technical Elective Courses (9 credits PER semester) EEC 383 (*EEC 310 or *PHY 243) Digital Systems [3] CIS 368 (CIS 265) Object-Oriented Design/Program [3] CIS 408 (CIS 265) Internet Programming [3] CIS 457 (CIS 368) Computer Graphics [3] CIS 465 (CIS 368) Multimedia [3] CIS 467 (CIS 390) Artificial Intelligence [3] CIS 470 (CIS 340) Mobile App Dev. [3] EEC 384 (EEC 383) Digital Systems Lab [2] CIS 490 (MTH 220, CIS 335) Foundations of Computing [3] EEC 487 (EEC 384) Advanced Digital Systems [3] EEC 488 (*EEC 487, *CIS 340) Hardware-Software Co-Design [3]	
ENG 100 [3] Intensive Writing or ENG 101 [3] College Writing	ESC 102 [3] Technical Writing (Preferred)		PHY 243 [5] Physics I (MTH 181) (WAC)	MTH 220 [3] Discrete Math (MTH 182 -C or better)	CIS 390 CIS 550 [3] Introduction to Algorithms (CIS 265 and MTH 220 and MTH 181)	CIS 434 [3] Software Engineering (CIS 265)			
MTH 165 [3] Intensive Precalc I OR MTH 167 [3] Precalculus I	MTH 168 [3] Precalculus II (MTH 165 or MTH 167)		General Ed. Elective [3]	STA 323 [3] Statistical Methods (MTH 182) OR ESC 310 [3] Statistics and Probability (MTH 182)	CIS 424 [3] Comparative Programming Languages (CIS 265)	CIS 430 CIS 530 [3] Database Concepts (CIS 265)			
★ ESC 100 [1] New Student Orientation	General Ed. Elective [3]		**ESC 130 [1] Engineering Co-op Orientation	PHY 244 [5] Physics II (PHY 243) (WAC)	PHL 215 [3] A&H Engineering Ethics (ENG 102 or ESC 102)(WAC) OR PHL 216 [3] A&H Data Ethics (WAC)	ESC 282 [3] SS Engr. Economy (MTH 182)			
						EEC 414 [2] Writing in ECE (PHL 215) (WAC)			
12 Total Credit Hours	15 Total Credit Hours		17 Total Credit Hours	18 Total Credit Hours	15 Total Credit Hours	17 Total Credit Hours			
Total Credits for CS Degree: 120 or 121 including ESC 130 Engineering Co-op Orientation									

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

-  Required CIS 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 CIS 300-400 Level Electives
-  Required Math Courses + MTH 283 to claim 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](#)

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

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Bachelor of COMPUTER SCIENCE (CS)

Updated May 2024

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] Intro to Engineering Design	CIS 151 [3] Invitation to Computing	CIS 260 [4] Intro to Programming (ESC 151 or CIS 151)	CIS 265 [4] Data Structures and Algorithms (CIS 260 and MTH 181)	CIS 340 [3] Systems Programming (CIS 265)	CIS 345 CIS 545 [3] Operating Systems (CIS 340)	CIS 390 CIS 550 [3] Intro. to Algorithms (CIS 265 and MTH 220 and MTH 181)	CIS 480 CIS 580 [3] Intro. to Computer Architecture (CIS 335)	CIS 493 [2] Senior Design I (*CIS 345)	CIS 494 [3] Senior Design II (CIS 493)		
★ ESC 100 [1] New Student Orientation	General Ed. Elective [3]	MTH 181 [4] Calculus I (MTH 168)	MTH 182 [4] Calculus II (MTH 181)	CIS 335 [3] Language Processors (CIS 265 and MTH 181)	MTH 288 [3] Linear Algebra (MTH 182 and ESC 152) OR ESC 350 [3] Linear Algebra for Engineers	CIS 424 [3] Comparative Programming Languages (CIS 265)	CIS 434 [3] Software Engineering (CIS 265)	CIS 475 [3] Computer Security (CIS 340)			
General Ed. Elective [3]	ESC 102 [3] Technical Writing (Preferred)	General Ed. Elective [3]	PHY 243 [5] Physics I (MTH 181) (WAC)	PHY 244 [5] Physics II (PHY 243) (WAC)	MTH 220 [3] Discrete Math (MTH 182 -C or better)	CIS 454 CIS 584 [3] Computer Networks (CIS 340)	CIS 430 CIS 530 [3] Database Concepts (CIS 265)	Suggested Technical Elective Courses (9 credits per semester) EEC 383 (*EEC 310 or *PHY 243) Digital Systems [3] CIS 368 (CIS 265) Object-Oriented Design/Program [3] CIS 408 (CIS 265) Internet Program. [3] CIS 457 (CIS 368) Computer Graphics [3] CIS 465 (CIS 368) Multimedia [3] CIS 467 (CIS 390) Artificial Intelligence [3] CIS 470 (CIS 340) Mobile App Dev. [3] EEC 384 (EEC 383) Digital Systems Lab [2] CIS 490 (MTH 220, CIS 335) Foundations of Computing [3] EEC 487 (EEC 384) Advanced Digital Systems [3] EEC 488 (*EEC 487, *CIS 340) Hardware-Software Co-Design [3]			
MTH 165 [3] Intensive Precalc I OR MTH 167 [3] Precalculus I	MTH 168 [3] Precalculus II (MTH 165 or MTH 167)	**ESC 130 [1] Engineering Co-op Orientation		ESC 282 [3] ss Engr. Economy (MTH 182)	STA 323 [3] Statistical Methods (MTH 182) OR ESC 310 [3] Statistics and Probability (MTH 182)	PHL 215 [3] A&H Engineering Ethics (ENG 102 or ESC 102) (WAC) or PHL 216 [3] A&H Data Ethics (WAC)	EEC 414 [2] Writing in ECE (PHL 215) (WAC)				
ENG 100 [3] Intensive Writing or ENG 101 [3] College Writing I							General Ed. Elective [3]				
12 Total Credit Hours	12 Total Credit Hours	12 Total Credit Hours	13 Total Credit Hours	14 Total Credit Hours	12 Total Credit Hours	12 Total Credit Hours	14 Total Credit Hours			14 Total Credit Hours	12 Total Credit Hours
Total Credits for CS Degree: 126 or 127 including ESC 130 Engineering Co-op Orientation											

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

- Required CIS 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 CIS 300-400 Level Electives
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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 CS undergraduate courses that satisfy Master's Degree credits

Course Number & Name
CIS 390 CIS 550: Introduction to Algorithms
CIS 480 CIS 580: Computer Architecture
CIS 345 CIS 545: Operating Systems
CIS 454 CIS 584: Computer Networks
CIS 430 CIS 530: Database Concepts

Access CampusNet to check when courses are offered each semester!

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