

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

[CLICK HERE](#)

Bachelor of CHEMICAL ENGINEERING (CHE)

Updated July 2024

4-Year Recommended Course Sequence with *Calculus Entry*

Click on the Course Name to access the course in the Undergraduate Catalog 24-25

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	CHM 262 [3] Gen. Chem. II CHM 267 [1] Gen. Chem. Lab II OR CHM 278 [1] REEL Lab II (CHM 261 & CHM 266)	ESC 152 [3] Programming with MATLAB Equivalent Programming	CHE 300 [4] Chem Eng. Principles (MTH 182, CHM 262 & PHY 241 & ESC 250 or ESC 120)	CHE 302 [4] Chem Eng. Thermo. (CHE 300, ESC 321 & MTH 281 or MTH 283 & ESC 250)	CHE 404 [4] Chemical Reactor Design (CHE 302, CHE 306, CHE 307, or CHE 308 & ESC 350) (WAC)	CHE 430 [4] Process Control (ESC 350 and CHE 404)	CHE 420 [4] Capstone Lab (CHE 306, CHE 404 & CHE 408)
★ ESC 100 [1] or ASC 101 [1] New Student Orientation	PHY 241 [5] Physics I (MTH 181)	**ESC 130 [1] Engineering Co-op Orientation	ESC 301 [3] Fluid Mechanics (ESC 250)	CHE 306 [4] Transport Phenomena (MTH 281 or MTH 283, CHE 300, ESC 301 & ESC 250)	CHE 408 [4] Separation Processes (CHE 302, CHE 306, and ESC 350)	CHE 440 [3] Process Design I (ESC 282, CHE 404 and CHE 408) (WAC)	CHE 441 [3] Process Design II (CHE 440)
CHM 261 [3] Gen. Chem. I CHM 266 [1] Gen. Chem. Lab	MTH 182 [4] Calculus II (MTH 181 – C or better)	ESC 321 [3] Thermodynamics (MTH 182)	MTH 283 [2] Multivariable Calculus (MTH 182 – C or better) OR MTH 284 [2] Matrices for Engineers (MTH 182 – C or better)	CHE 307 [3] Chemical Eng. Methods (CHE 300, ESC 152 and *CHE 302 and *CHE 306) (WAC)	CHM 322 [3] Physical Chemistry II	ChBME Senior Elective [3] 400-500 Level	ChBME Senior Elective [3] 400-500 Level
ENG 100 [3] Intensive Writing or ENG 101 [3] College Writing	ESC 102 [3] Technical Writing (Preferred) (ENG 100 or ENG 101)	ESC 270 [3] Materials Science (CHM 261)	ESC 350 [3] Linear Algebra for Engineers OR MTH 288 [3] Linear Algebra (MTH 182 and ESC 152)	CHM 331 [3] Organic Chemistry (CHM 262)	ESC 282 [3] SS Engineering Economy (MTH 182)	Advanced Science Elective [3] 300-500 Level	General Ed. Elective [3]
MTH 181 [4] Calculus I		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)	STA 323 [3] Statistical Methods (MTH 182) OR ESC 310 [3] Statistics and Probability (MTH 182)	CHM 336 [1] Organic Chem. Lab (*CHM 331)	PHL 215 [3] A&H Engineering Ethics (ENG 102 or ESC 102) (WAC)	General Ed. Elective [3]	General Ed. Elective [3]
		PHY 242 [5] Physics II (PHY 241)	General Ed. Elective [3]	OR HERE			
14 Total Credit Hours	16 Total Credit Hours	18 Total Credit Hours	15 or 18 Total Credit Hours	15 or 18 Total Credit Hours	17 Total Credit Hours	16 Total Credit Hours	16 Total Credit Hours

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

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

- Required CHE 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 CHE 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)

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

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](#) ↓

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

[CLICK HERE](#)

Bachelor of CHEMICAL ENGINEERING (CHE)

4-Year Recommended Course Sequence with *Precalculus Entry*

Updated July 2024

Click on the Course Name 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] <u>Intro to Engineering Design</u>	MTH 168 [3] <u>Precalculus II</u> (MTH 165 or MTH 167)		ESC 152 [3] <u>Programming with MATLAB</u> (MTH 168 or Equivalent)	ESC 321 [3] <u>Thermodynamics</u> (MTH 182)		CHE 302 [4] <u>Chem Eng. Thermo.</u> (CHE 300 and ESC 321 and MTH 283 or MTH 281 and ESC 250 or MTH 286)	CHE 404 [4] Chemical Reactor Design (CHE 302 & CHE 306 & CHE 307 & ESC 350 or MTH 288) (WAC)	CHE 430 [4] <u>Process Control</u> (ESC 350 or MTH 288 and CHE 404)	CHE 420 [4] <u>Chem. Eng. Capstone Lab</u> (CHE 306 and CHE 404 and CHE 408)
★ESC 100 [1] or ASC 101 [1] <u>New Student Orientation</u>	ESC 102 [3] <u>Technical Writing</u> (Preferred)	OPSTEM MTH 180 SUMMER CALCULUS I [4] (Average B- or better in MTH 167&168)	CHM 261 [3] <u>Gen. Chem. I</u> CHM 266 [1] <u>Gen. Chem. Lab</u> (MTH 168)	PHY 242 [5] <u>Physics II</u> (PHY 241 and MTH 182)	CHE 300 <u>Chem Eng. Principles</u> (MTH 182, CHM 262, PHY 241, ESC 250 or MTH 286) [4]	CHE 306 [4] <u>Transport Phenomena</u> (MTH 283 or MTH 281 and CHE 300 and ESC 301 and ESC 250 or MTH 286)	CHE 408 [4] <u>Separation Processes</u> (CHE 302 and CHE 306 and ESC 350 or MTH 288)	CHE 440 [3] Process Design I (ESC 282 and CHE 404 and CHE 408) (WAC)	CHE 441 [3] <u>Process Design II</u> (CHE 440)
MTH 165 [3] <u>Intensive Precalc</u> OR MTH 167 [3] <u>Precalculus I</u>	General Ed. Elective [3]		PHY 241 [5] <u>Physics I</u> (MTH 181)	MTH 286 [3] <u>Intro. to Diff EQ</u> (MTH 182 – C or better) OR ESC 250 [3] <u>Diff EQ for Eng.</u> (MTH 182 – C or better)	MTH 307 [3] Chemical Eng. Methods (CHE 300 and ESC 152 and *CHE 302 and *CHE 306) (WAC)	PHL 215 [3] A&H <u>Engineering Ethics</u> (ENG 102 or ESC 102) (WAC)	ChBME Senior Elective [3] 300-400 Level	ChBME Senior Elective [3] 300-400 Level	
ENG 100 [3] <u>Intensive Writing</u> or ENG 101 [3] <u>College Writing I</u>	General Ed. Elective [3]		MTH 182 [4] <u>Calculus II</u> (MTH 181)	MTH 283 [2] <u>Multivariable Calculus</u> (MTH 182 –C or better) OR MTH 284 [2] <u>Matrices for Engineers</u> (MTH 182 –C or better)	ESC 270 [3] <u>Materials Science</u> (CHM 261 and MTH 168)	CHM 331 [3] <u>Organic Chemistry</u> (CHM 262)	ESC 282 [3] SS <u>Engineering Economy</u> (MTH 182)	Advanced Science Elective [3] 300-400 Level	
General Ed. Elective [3]	General Ed. Elective [3]		**ESC 130 [1] <u>Engineering Co-op Orientation</u>	CHM 262 [3] <u>Gen. Chem. II</u> CHM 267 [1] <u>Gen. Chem. Lab II</u> OR CHM 278 [1] <u>REEL Lab II</u> (CHM 261 & CHM 266)	ESC 301 <u>Fluid Mechanics</u> (ESC 250 & MTH 286) [3]	CHM 336 [1] <u>Organic Chem. Lab</u> (*CHM 331)	STA 323 [3] <u>Statistical Methods</u> (MTH 182) or ESC 310 [3] <u>Statistics and Probability</u> (MTH 182)	CHM 322 [3] <u>Physical Chem. II</u>	
12 Total Credit Hours	15 Total Credit Hours		4 Total Credit Hours	17 Total Credit Hours	17 Total Credit Hours	7 Total Credit Hours	14 Total Credit Hours	15 Total Credit Hours	16 Total Credit Hours

Total Credits for CHE Degree: 133 including ESC 130 Engineering Co-op Orientation

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

- Required CHE 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 CHE 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)

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

[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!
[CLICK HERE](#)

Updated July 2024

Bachelor of CHEMICAL ENGINEERING (CHE)

5-Year Recommended Course Sequence with *Precalculus Entry*

Click on the Course Name to access Course Catalog Descriptions

Fall2 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	MTH 168 [3] Precalculus II (MTH 165 or MTH 167)	ESC 152 [3] Programming with MATLAB (MTH 168 or Equivalent)	ESC 321 [3] Thermodynamics (MTH 182)	ESC 270 [3] Materials Science (CHM 261)	CHE 300 [4] Chem Eng. Principles (MTH 182 and CHM 262 and PHY 241 and ESC 250 or MTH 286)	CHE 302 [4] Chem Eng. Thermo. (CHE 300 and ESC 321 and MTH 283 or MTH 281 and ESC 250 or MTH 286)	CHE 404 [4] Chemical Reactor Design (CHE 302 & CHE 306 & CHE 307 & ESC 350 or MTH 288) (WAC)	CHE 430 [4] Process Contro (ESC 350 or MTH 288 and CHE 404)	CHE 420 [4] Chem. Eng. Capstone Lab (CHE 306 and CHE 404 and CHE 408)
★ ESC 100 [1] New Student Orientation	ESC 102 [3] Technical Writing (Preferred)	CHM 261 [3] Gen. Chem. I CHM 266 [1] Gen. Chem. Lab (MTH 168)	PHY 241 [5] Physics I (MTH 181)	PHY 242 [5] Physics II (PHY 241 and MTH 182)	ESC 301 [3] Fluid Mechanics (ESC 250 or MTH 286)	CHE 306 [4] Transport Phenomena (MTH 283 or MTH 281 and CHE 300 and ESC 301 and ESC 250 or MTH 286)	CHE 408 [4] Separation Processes (CHE 302 and CHE 306 and ESC 350 or MTH 288)	CHE 440 [3] Process Design I (ESC 282 and CHE 404 and CHE 408)	CHE 441 [3] Process Design II (CHE 440)
MTH 165 [3] Intensive Precalc I OR MTH 167 [3] Precalculus I	General Ed. Elective [3]	MTH 181 [4] Calculus I (MTH 168)	MTH 182 [4] Calculus II (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)	CHM 262 [3] Gen. Chem. II CHM 267 [1] Gen. Chem. Lab II OR CHM 278 [1] REEL Lab II (CHM 261 & CHM 266)	CHE 307 [3] Chemical Eng. Methods (CHE 300 and ESC 152 and *CHE 302 and *CHE 306)	CHM 322 [3] Physical Chem. II	ChBME Senior Elective [3] 300-400 Level	ChBME Senior Elective [3] 300-400 Level
ENG 100 [3] Intensive Writing or ENG 101 [3] College Writing I	General Ed. Elective [3]	PHL 215 [3] A&H Engineering Ethics (ENG 102 or ESC 102)	General Ed. Elective [3]	General Ed. Elective [3]	MTH 283 [2] Multivariable Calculus (MTH 182 – C or better) OR MTH 284 [2] Matrices for Engineers (MTH 182 – C or better)	CHM 331 [3] Organic Chemistry (CHM 262) CHM 336 [1] Organic Chem. Lab (*CHM 331)	ESC 282 [3] SS Engineering Economy (MTH 182)	STA 323 [3] Statistical Methods (MTH 182) or ESC 310 [3] Statistics and Probability (MTH 182)	Advanced Science Elective [3] 300-400 Level
General Ed. Elective [3]		**ESC 130 [1] Engineering Co-op Orientation							
12 Total Credit Hours	12 Total Credit Hours	15 Total Credit Hours	12 Total Credit Hours	14 Total Credit Hours	13 Total Credit Hours	15 Total Credit Hours	14 Total Credit Hours	13 Total Credit Hours	13 Total Credit Hours

Total Credits for CHE Degree: **136** including ESC 130 Engineering Co-op Orientation

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

- Required CHE 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 CHE 300-400 Level Electives
- Required Math Courses **Substitute courses to achieve the Math Minor**
- General Ed. Electives (2 A&Hs, 2 Ss, 1 ALAAME, & 2 DIVs)**

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

Ⓢ [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)

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

List of CHE undergraduate courses that satisfy Master's Degree credits

Access CampusNet to check when courses are offered each semester.

Course Number & Name

[CHE 448/CHE 548 : Chemical Process Safety](#)

[CHE 494/CHE 594 : Selected Topics in Chemical Egr.](#)

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)
ANT 153 – Intro to African Cultures (FALL ONLY)	X		X
ANT 275 – Ancient Mysteries	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
ANT 103 – Rise/Fall of Civilizations		X	X
ANT 171 – Native Civilization of Americas		X	X
ARB 274 – Introduction to Middle East (SPRING ONLY)		X	X
ART 281 – Asian Art		X	X
ART 286 – African Art		X	X
HIS 165 – Intro to Latin American History (SPRING ONLY)		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 (SPRING ONLY)		X	X
REL 101 – Understanding Religion		X	X
REL 268 – Religion & Culture in Africa (FALL ONLY)		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. \(African-Amer.\)](#)