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Updated July 2024

Bachelor of MECHANICAL ENGINEERING (MCE)

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] Introduction to Engineering Design	MCE 181 [2] CAE Lab II (MCE 180)	ESC 201 [3] Statics (PHY 241)	ESC 202 [3] Dynamics (ESC 201)	ESC 321 [3] Thermodynamics (MTH 182)	MCE/ESC 315 [3] Electrical Engineering Concepts (ESC 152, ESC 250 & PHY 242)	MCE 450 [2] Design Project I (WAC)	MCE 451 [3] Design Project II (MCE 450) & (WAC)
★ ESC 100 [1] New Student Orientation	ESC 152 [3] Programming with MATLAB (MTH 168 or Equivalent)	MCE 276 [3] Materials & Manufacturing Processes (MCE 181 & *MCE 286)	ESC 301 [3] Fluid Mechanics (ESC 250)	MCE 260 [3] Kinematics (MTH 281 and ESC 152)	MCE 365 [3] Machine Design I (MCE 362)	MCE 441 [3] or MCE 541 [4] Intro to Linear Controls Systems (ESC 350 and MCE 371)	General Ed. Elective [3]
MCE 180 [2] CAE Lab I	PHY 241 [5] Physics I (MTH 181)	MCE 286 [1] Manufacturing Processes Lab (MCE 181 & *MCE 276)	ESC 211 [3] Strength of Materials (ESC 201)	MCE 371 [3] Vibrations (ESC 202 and ESC 250)	MCE 324 [3] Intro to Heat Transfer (ESC 301 and ESC 321)	MCE 470 [3] Engr. Measurements (ESC 211, ESC/MCE 315, MCE 324, and MCE 371) & *MCE 480)	General Ed. Elective [3]
CHM 261 [3] Gen. Chem. I CHM 266 [1] Gen. Chem. I Lab	ESC 102 [3] Technical Writing (Preferred)	**ESC 130 [1] Engineering & Computer Science Career	PHY 242 [5] Physics II (PHY 241 and MTH 182)	MCE 362 [3] Machine Analysis (ESC 211, MCE 181 & MCE 276)	MCE 421 [3] or MCE 521 [4] Applied Thermodynamics (ESC 321 & *MCE 481)	MCE 480 [1] Engineering Measurements Lab (*MCE 470)	PHL 215 [3] <i>A&H</i> Engineering Ethics (ENG 102 or ESC 102) (WAC)
ENG 100 [3] Intensive Writing or ENG 101 [3] College Writing I	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)	General Ed. Elective [3]	ESC 350 [3] Linear Algebra for Engineers or MTH 288 [3] Linear Algebra (MTH 182 & ESC 152)	MCE 481 [1] Thermodynamics Lab (*MCE 421)	MCE Lab or Elective [3] (Min. 1 Lab Elective) MCE 400-500 [4] Master's Level Courses	2 MCE Labs or Electives [3] MCE 400-500 [4] Master's Level Courses
MTH 181 [4] Calculus I		MTH 281 [4] Multivariable Calculus (MTH 182)			General Ed. Elective [3]	ESC 282 [3] <i>SS</i> Engineering Economy (MTH 182)	
16 Total Credit Hours	17 Total Credit Hours	14 or 15 Total Credit Hours	17 Total Credit Hours	15 Total Credit Hours	16 Total Credit Hours	15 Total Credit Hours	18 Total Credit Hours
Total Credits for MCE Degree: 128 or 129 including ESC 130 Engineering Co-op Orientation							

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

- Required MCE 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 MCE 300-400 Level Electives
- Required Math Courses + STA 323 to earn the Math Minor
- [General Ed. Electives \(2 A&Hs, 2 SSs, 1 ALAAME, & 2 DIVs\)](#)

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

[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](#) ↓

Begin to earn credits toward a Master's Degree while taking undergraduate courses!
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Updated July 2024

Bachelor of MECHANICAL ENGINEERING (MCE)

4-Year Recommended Course Sequence with *Precalculus Entry*

[CLICK HERE](#) to access Catalog Course 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	Summer Semester #3	Fall Semester 7	Spring Semester 8	
MCE 180 [2] CAE Lab I	MCE 181 [2] CAE Lab II (MCE 180)		ESC 152 [3] Programming with MATLAB (MTH 168 or Equivalent)	ESC 201 [3] Statics (PHY 241)		MCE 371 [3] Vibrations (ESC 202 and ESC 250)	MCE/ESC 315 [3] Electrical Engineering Concepts (ESC 152, ESC 250 & PHY 242)		MCE 450 [2] Design Project I (WAC)	MCE 451 [3] Design Project II (MCE 450) & (WAC)	
★ ESC 100 [1] New Student Orientation	General Ed. Elective [3]	OPSTEM MTH 180 SUMMER CALC I [4] (Avg B- or better in MTH 167 & 168)	PHY 241 [5] Physics I (MTH 181)	PHY 242 [5] Physics II (MTH 182)	MTH 288 [3] Linear Algebra (MTH 182 and ESC 152) or ESC 350 [3] Linear Algebra for Engineers	ESC 321 [3] Thermodynamics (MTH 182)	MCE 324 [3] Intro to Heat Transfer (ESC 301 & ESC 321)	CHM 261 [3] Gen. Chem. I	MCE 441 [3] or MCE 541 [4] Intro to Linear Controls (ESC 350 and MCE 371)	MCE 470 [3] Eng. Measurements (ESC 315 and MCE 324 and MCE 371)	
ESC 120 [2] Intro to Engineering Design	General Ed. Elective [3]		MTH 182 [4] Calculus II (MTH 181)	MTH 281 [4] Multivariable Calculus (MTH 182)		MCE 260 [3] Kinematics (MTH 281 and ESC 152)	MCE 362 [3] Machine Analysis (ESC 211, MCE 181 and MCE 276)		MCE 365 [3] Machine Design I (MCE 362)	MCE 480 [1] Eng. Measurements Lab (*MCE 470)	
MTH 165 [3] Intensive Precalc I OR MTH 167 [3] Precalculus I	MTH 168 [3] Precalculus II (MTH 165 or MTH 167)		MCE 276 [3] Materials & Manufacturing Processes (MCE 181 & *MCE 286)	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)	ESC 202 [3] Dynamics (ESC 201)	ESC 211 [3] Strength of Materials (ESC 201)	MCE 421 [3] or MCE 521 [4] Applied Thermodynamics (ESC 321 and *MCE 481)	MCE Lab or Elective [3] (Min. 1 Lab Elective) MCE 400-500 Master's Level Courses [4]	ESC 282 [3] SS Engineering Economy (MTH 182)		
General Ed. Elective [3]	ESC 102 [3] Technical Writing (Preferred)		MCE 286 [1] Materials & Man. Processes Lab (MCE 181 and *MCE 276)			ESC 301 [3] Fluid Mechanics (ESC 250)	MCE 481 [1] Thermodynamics Lab (*MCE 421)	MCE Lab or Elective [3 or 4] 300-400 Level	MCE Lab or Elective [3 or 4] 300-400 Level		
ENG 100 [3] Intensive Writing or ENG 101 [3] College Writing I			**ESC 130 [1] Engineering Co-op Orientation	**ESC 130 [1] Engineering Co-op Orientation				PHL 215 [3] A&H Engineering Ethics (ENG 102 or ESC 102)	General Ed. Elective [3]		
14 Total Credit Hours	14 Total Credit Hours		4 Total Credit Hrs	16-17 Total Credit Hours	15 - 16 Total Credit Hours	6 Total Credit Hrs	18 Total Credit Hrs	16 Total Credit Hours	4 Total Credit Hrs	17 Total Credit Hours	16 Total Credit Hours

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

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

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

EASILY EARN A MATH MINOR AS A MCE 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)

↓ [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 MECHANICAL ENGINEERING (MCE)

Updated July 2024

5-Year Recommended Course Sequence with *Precalculus Entry*

[CLICK HERE](#) to access Catalog Course 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] <u>Intro to Engineering Design</u>	MCE 181 [2] <u>CAE Lab II (MCE 180)</u>	**ESC 130 [1] <u>Engineering Co-op Orientation</u>	MCE 276 [3] <u>Materials & Man.Processes (MCE 181 and *MCE 286)</u>	ESC 201 [3] <u>Statics (PHY 241)</u>	ESC 211 [3] <u>Strength of Materials (ESC 201)</u>	MCE 362 [3] <u>Machine Analysis (ESC 211, MCE 181 and MCE 276)</u>	MCE 324 [3] <u>Intro to Heat Transfer (ESC 301 & ESC 321)</u>	MCE 450 [2] <u>Design Project I (WAC)</u>	MCE 451 [3] <u>Design Project II (MCE 450 (WAC))</u>
★ ESC 100 [1] <u>New Student Orientation</u>	ESC 102 [3] <u>Technical Writing (Preferred)</u>	ESC 152 [3] <u>Programming with Matlab (MTH 168 or Equivalent)</u>	MCE 286 [1] <u>Materials & Manufacturing Processes Lab (MCE 181 and *MCE 276)</u>	PHY 242 [5] <u>Physics II (MTH 182)</u>	MCE 260 [3] <u>Kinematics (MTH 281 and ESC 152)</u>	ESC 321 [3] <u>Thermodynamics (MTH 182 and ESC 152)</u>	MCE/ESC 315 [3] <u>Electrical Engineering Concepts (MCE 152, ESC 250 And PHY 242)</u>	MCE 441 [3] or MCE 541 [4] <u>Intro to Linear Controls (ESC 350 and MCE 371)</u>	MCE 470 [3] <u>Engineering Measurements (ESC 211, ESC/MCE 315, MCE 324, and MCE 371) (*MCE 480)</u>
MCE 180 [2] <u>CAE Lab I</u>	General Ed. Elective [3]	CHM 261 [3] <u>Gen. Chem. I</u> CHM 266 [1] <u>Gen. Chem. I Lab (MTH 168)</u>	PHY 241 [5] <u>Physics I (MTH 181)</u>	MTH 286 [3] <u>Intro. to Diff EQ (MTH 182 – C or better) OR ESC 250 [3] Diff EQ for Eng. (MTH 182 – C or better)</u>	ESC 350 [3] <u>Linear Algebra for Engineers</u> OR MTH 288 [3] <u>Linear Algebra (MTH 182 and ESC 152)</u>	ESC 301 [3] <u>Fluid Mechanics (ESC 250)</u>	MCE 421 [3] or MCE 521 [4] <u>Applied Thermodynamics (ESC 321 and *MCE 481)</u>	MCE 365 [3] <u>Machine Design I (MCE 362)</u>	MCE 480 [1] <u>Engineering Measurements Lab (*MCE 470)</u>
ENG 100 [3] <u>Intensive Writing</u> or ENG 101 [3] <u>College Writing I</u>	General Ed. Elective [3]	General Ed. Elective [3]	MTH 182 [4] <u>Calculus II (MTH 181)</u>	MTH 281 [4] <u>Multivariable Calculus (MTH 182)</u>	ESC 202 [3] <u>Dynamics (ESC 201)</u>	MCE 371 [3] <u>Vibrations (ESC 202 and ESC 250)</u>	MCE 481 [1] <u>Thermodynamics Lab (*MCE 421)</u>	MCE Lab or Elective [3] <u>(Min. 1 Lab Elective)</u> MCE 400-500 <u>Master's Level Courses [4]</u>	ESC 282 [3] SS <u>Engineering Economy (MTH 182)</u>
MTH 165 [3] <u>Intensive Precalc I</u> OR MTH 167 [3] <u>Precalculus I</u>	MTH 168 [3] <u>Precalculus II (MTH 165 or MTH 167)</u>	MTH 181 [4] <u>Calculus I (MTH 168)</u>					PHL 215 [3] A&H <u>Engineering Ethics (ENG 102 or ESC 102) (WAC)</u>	MCE Lab or Elective [3 or 4] <u>300-400 Level</u>	MCE Lab or Elective [3 or 4] <u>300-400 Level</u>
General Ed. Elective [3]									
14 Total Credit Hours	14 Total Credit Hours	15 Total Credit Hours	13 Total Credit Hours	15 Total Credit Hours	12 Total Credit Hours	12 Total Credit Hours	13 Total Credit Hours	14 Total Credit Hours	13 Total Credit Hours

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

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

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

- Required MCE 300-400 Level Electives
- Required Math Courses + STA 323 to earn the Math Minor
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[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 MCE undergraduate courses that satisfy Master's Degree credits

Course Number & Name
MCE 424/ MCE 524 : Applied Heat Transfer
MCE 430/ MCE 530 : Applied Fluid Mechanics
MCE 444/ MCE 544 : Applied Combustion Processes
MCE 445/MCE 545/EEC 510: Modern Controls
MCE 466/MCE 566 : Machine Design II
Several MCE 493/ MCE 593 Courses: Special Topics in MCE

Access CampusNet to check when courses are offered each semester.

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