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Updated April 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]<br><a href="#">Intro to Engineering Design</a>   | MCE 181 [2]<br><a href="#">CAE Lab II (MCE 180)</a>          | ESC 201 [3]<br><a href="#">Statics (PHY 241)</a>   | ESC 202 [3]<br><a href="#">Dynamics (ESC 201)</a>               | ESC 321 [3]<br><a href="#">Thermodynamics (MTH 182)</a>  | MCE/ESC 315 [3]<br><a href="#">Electrical Engineering Concepts (ESC 152, ESC 250 &amp; PHY 242)</a> | MCE 450 [2]<br><a href="#">Design Project I (WAC)</a>   | MCE 451 [3]<br><a href="#">Design Project II (MCE 450) &amp; (WAC)</a>                      |
| ★ ESC 100 [1]<br><a href="#">New Student Orientation</a>   | ESC 152 [3]<br><a href="#">Programming with MATLAB</a>       | MCE 276 [3]<br><a href="#">Materials &amp; Manufacturing Processes (MCE 181 &amp; *MCE 286)</a>                                  | ESC 301 [3]<br><a href="#">Fluid Mechanics (ESC 250)</a>        | MCE 260 [3]<br><a href="#">Kinematics (MTH 281 and ESC 152)</a>  | MCE 365 [3]<br><a href="#">Machine Design I (MCE 362)</a>   | MCE 441/MCE 541 [3]<br><a href="#">Intro to Linear Controls (ESC 350 and MCE 371)</a>                                     | General Ed. Elective [3]  |
| MCE 180 [2]<br><a href="#">CAE Lab I</a>   | PHY 241 [5]<br><a href="#">Physics I (MTH 181)</a>           | MCE 286 [1]<br><a href="#">Manufacturing Processes Lab (MCE 181 &amp; *MCE 276)</a>  | ESC 211 [3]<br><a href="#">Strength of Materials (ESC 201)</a>  | MCE 371 [3]<br><a href="#">Vibrations (ESC 202 and ESC 250)</a>  | MCE 324 [3]<br><a href="#">Intro to Heat Transfer (ESC 301 and ESC 321)</a>                         | MCE 470 [3]<br><a href="#">Engr. Measurements (ESC 211, ESC/MCE 315, MCE 324, and MCE 371) &amp; *MCE 480)</a>            | General Ed. Elective [3]  |
| CHM 261 [3]<br><a href="#">Gen. Chem. I</a><br>CHM 266 [1]<br><a href="#">Gen. Chem. I Lab</a>             | ESC 102 [3]<br><a href="#">Technical Writing (Preferred)</a> | **ESC 130 [1]<br><a href="#">Engineering Co-op Orientation</a>   | PHY 242 [5]<br><a href="#">Physics II (PHY 241 and MTH 182)</a> | MCE 362 [3]<br><a href="#">Machine Analysis (ESC 211, MCE 181 &amp; MCE 276)</a>   | MCE 421/ MCE 521 [3]<br><a href="#">Applied Thermodynamics (ESC 321 &amp; *MCE 481)</a>             | MCE 480 [1]<br><a href="#">Engineering Measurements Lab (*MCE 470)</a>  | PHL 215 [3] <i>A&amp;H</i><br><a href="#">Engineering Ethics (ENG 102 or ESC 102) (WAC)</a> |
| ENG 100 [3]<br><a href="#">Intensive Writing</a><br>or<br>ENG 101 [3]<br><a href="#">College Writing I</a> | MTH 182 [4]<br><a href="#">Calculus II (MTH 181)</a>         | MTH 286 [3]<br><a href="#">Intro. to Diff EQ (MTH 182 – C or better) or ESC 250 [3] Diff EQ for Eng. (MTH 182 – C or better)</a> | General Ed. Elective [3]  | ESC 350 [3]<br><a href="#">Linear Algebra for Engineers</a><br>or<br>MTH 288 [3]<br><a href="#">Linear Algebra (MTH 182 &amp; ESC 152)</a> | MCE 481 [1]<br><a href="#">Thermodynamics Lab (*MCE 421)</a>  | MCE Lab or Elective [3]<br><a href="#">(Min. 1 Lab Elective)</a><br>MCE 400-500<br><a href="#">Master's Level Courses</a> | 2 MCE Labs or Electives [3]<br>MCE 400-500<br><a href="#">Master's Level Courses</a>        |
| MTH 181 [4]<br><a href="#">Calculus I</a>  |  | MTH 281 [4]<br><a href="#">Multivariable Calculus (MTH 182)</a>  |   |  | General Ed. Elective [3]  | ESC 282 [3] <i>SS</i><br><a href="#">Engineering Economy (MTH 182)</a>  |   |
| 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 April 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]<br>CAE Lab I   | MCE 181 [2]<br>CAE Lab II<br>(MCE 180)                |   | ESC 152 [3]<br>Programming with MATLAB<br>(MTH 181)                        | ESC 201 [3]<br>Statics<br>(PHY 241)   |  | MCE 371 [3]<br>Vibrations<br>(ESC 202 and ESC 250) | MCE/ESC 315 [3]<br>Electrical Engineering Concepts<br>(ESC 152, ESC 250 & PHY 242) |  | MCE 450 [2]<br>Design Project I (WAC)                                     | MCE 451 [3]<br>Design Project II (MCE 450) & (WAC)                    |
| ★ ESC 100 [1]<br>New Student Orientation                             | General Ed. Elective [3]                              | OPSTEM MTH 180 SUMMER CALC I [4]<br>(Avg B- or better in MTH 167 & 168) | PHY 241 [5]<br>Physics I<br>(MTH 181)                                      | PHY 242 [5]<br>Physics II<br>(MTH 182)  | MTH 288 [3]<br>Linear Algebra (MTH 182 and ESC 152) or ESC 350 [3]<br>Linear Algebra for Engineers | ESC 321 [3]<br>Thermodynamics<br>(MTH 182)         | MCE 324 [3]<br>Intro to Heat Transfer<br>(ESC 301 & ESC 321)                       | CHM 261 [3]<br>Gen. Chem. I              | MCE 441/ MCE 541 [3]<br>Intro to Linear Controls<br>(ESC 350 and MCE 371) | MCE 470 [3]<br>Eng. Measurements<br>(ESC 315 and MCE 324 and MCE 371) |
| ESC 120 [2]<br>Intro to Engineering Design                           | General Ed. Elective [3]                              |   | MTH 182 [4]<br>Calculus II<br>(MTH 181)                                    | MTH 281 [4]<br>Multivariable Calculus<br>(MTH 182)  | ESC 350 [3]<br>Linear Algebra for Engineers  | MCE 260 [3]<br>Kinematics<br>(MTH 281 and ESC 152) | MCE 362 [3]<br>Machine Analysis<br>(ESC 211, MCE 181 and MCE 276)                  | CHM 266 [1]<br>Gen. Chem I Lab (MTH 168) | MCE 365 [3]<br>Machine Design I<br>(MCE 362)                              | MCE 480 [1]<br>Eng. Measurements Lab (*MCE 470)                       |
| MTH 165 [3]<br>Intensive Precalc I OR MTH 167 [3]<br>Precalculus I   | MTH 168 [3]<br>Precalculus II<br>(MTH 165 or MTH 167) |   | MCE 276 [3]<br>Materials & Manufacturing Processes<br>(MCE 181 & *MCE 286) | MTH 286 [3]<br>Intro. to Diff EQ<br>(MTH 182 – C or better) OR ESC 250 [3]<br>Diff EQ for Eng.<br>(MTH 182 – C or better) | ESC 202 [3]<br>Dynamics (ESC 201)  | ESC 211 [3]<br>Strength of Materials<br>(ESC 201)  | MCE 421/ MCE 521 [3]<br>Applied Thermodynamics<br>(ESC 321 and *MCE 481)           |  | MCE Elective [3]<br>300-400 Level   | ESC 282 [3] SS<br>Engineering Economy<br>(MTH 182)                    |
| General Ed. Elective [3]   | ESC 102 [3]<br>Technical Writing (Preferred)          |   | MCE 286 [1]<br>Materials & Man. Processes Lab<br>(MCE 181 and *MCE 276)    |   |  | ESC 301 [3]<br>Fluid Mechanics<br>(ESC 250)        | MCE 481 [1]<br>Thermodynamics Lab<br>(*MCE 421)                                    |  | MCE Elective [3]<br>300-400 Level   | MCE Lab Elective [3]<br>300-400 Level                                 |
| ENG 100 [3]<br>Intensive Writing or ENG 101 [3]<br>College Writing I |   |   | **ESC 130 [1]<br>Engineering Co-op Orientation                             | **ESC 130 [1]<br>Engineering Co-op Orientation  |  |  |  |  | PHL 215 [3] A&H<br>Engineering Ethics<br>(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   |

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)

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[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 April 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]<br>Intro to Engineering Design                              | MCE 181 [2]<br>CAE Lab II (MCE 180)                | **ESC 130 [1]<br>Engineering Co-op Orientation                           | MCE 276 [3]<br>Materials & Man. Processes (MCE 181 and *MCE 286)              | ESC 201 [3]<br>Statics (PHY 241)   | ESC 211 [3]<br>Strength of Materials (ESC 201)  | MCE 362 [3]<br>Machine Analysis (ESC 211, MCE 181 and MCE 276) | MCE 324 [3]<br>Intro to Heat Transfer (ESC 301 & ESC 321)                  | MCE 450 [2]<br>Design Project I (WAC)                                     | MCE 451 [3]<br>Design Project II (MCE 450 (WAC))  |
| ★ ESC 100 [1]<br>New Student Orientation                                | ESC 102 [3]<br>Technical Writing (Preferred)       | ESC 152 [3]<br>Programming with Matlab (MTH 168)                         | MCE 286 [1]<br>Materials & Manufacturing Processes Lab (MCE 181 and *MCE 276) | PHY 242 [5]<br>Physics II (MTH 182)  | MCE 260 [3]<br>Kinematics (MTH 281 and ESC 152)   | ESC 321 [3]<br>Thermodynamics (MTH 182 and ESC 152)            | MCE/ESC 315 [3]<br>Electrical Eng. Concepts (MCE 152, ESC 250 And PHY 242) | MCE 441/<br>MCE 541 [3]<br>Intro to Linear Controls (ESC 350 and MCE 371) | MCE 470 [3]<br>Engineering Measurements (ESC 211, ESC/MCE 315, MCE 324, and MCE 371) (*MCE 480) |
| MCE 180 [2]<br>CAE Lab I  | General Ed. Elective [3]                           | CHM 261 [3]<br>Gen. Chem. I<br>CHM 266 [1]<br>Gen. Chem. I Lab (MTH 168) | PHY 241 [5]<br>Physics I (MTH 181)  | MTH 286 [3]<br>Intro. to Diff EQ (MTH 182 – C or better) OR<br>ESC 250 [3]<br>Diff EQ for Eng. (MTH 182 – C or better) | ESC 350 [3]<br>Linear Algebra for Engineers OR<br>MTH 288 [3]<br>Linear Algebra (MTH 182 and ESC 152) | ESC 301 [3]<br>Fluid Mechanics (ESC 250)                       | MCE 421/<br>MCE 521 [3]<br>Applied Thermodynamics (ESC 321 and *MCE 481)   | MCE 365 [3]<br>Machine Design I (MCE 362)                                 | MCE 480 [1]<br>Engineering Measurements Lab (*MCE 470)  |
| ENG 100 [3]<br>Intensive Writing or<br>ENG 101 [3]<br>College Writing I | General Ed. Elective [3]                           | General Ed. Elective [3]   | MTH 182 [4]<br>Calculus II (MTH 181)  | MTH 281 [4]<br>Multivariable Calculus (MTH 182)  | ESC 202 [3]<br>Dynamics (ESC 201)   | MCE 371 [3]<br>Vibrations (ESC 202 and ESC 250)                | MCE 481 [1]<br>Thermodynamics Lab (*MCE 421)                               | MCE Elective [3]<br>300-400 Level   | ESC 282 [3] SS<br>Engineering Economy (MTH 182)   |
| MTH 165 [3]<br>Intensive Precalc I OR<br>MTH 167 [3]<br>Precalculus I   | MTH 168 [3]<br>Precalculus II (MTH 165 or MTH 167) | MTH 181 [4]<br>Calculus I (MTH 168)                                      |   |  |   |  | PHL 215 [3] A&H<br>Engineering Ethics (ENG 102 or ESC 102) (WAC)           | MCE Elective [3]<br>300-400 Level   | MCE Lab Elective [3]<br>300-400 Level   |
| 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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[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   |
|--|
| <a href="#">MCE 424/ MCE 524 : Applied Heat Transfer</a>                 |
| <a href="#">MCE 430 / MCE 530 : Applied Fluid Mechanics</a>              |
| <a href="#">MCE 444/ MCE 544 : Applied Combustion Processes</a>          |
| <a href="#">MCE 445/MCE 545/EEC 510: Modern Controls</a>                 |
| <a href="#">MCE 466//MCE 566 : Machine Design II</a>                     |
| <a href="#">Several MCE 493 / MCE 593 Courses: Special Topics in MCE</a> |
| <a href="#">MCE 517 : Manufacturing Systems Engineering</a>              |
| <a href="#">MCE 550: Advanced Dynamics (Combine with MCE 493)</a>        |
| <a href="#">MCE 580 : Finite Element Analysis I</a>                      |

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