# BIOMEDICAL ENGINEERING

## Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 101 [*] [9]</td>
<td>Engineering Exploration I</td>
</tr>
<tr>
<td>EGR 102 [*]</td>
<td>Fundamentals of Egr Computing</td>
</tr>
<tr>
<td>CIS/WRD 110 [*]</td>
<td>Comp &amp; Comm I</td>
</tr>
<tr>
<td>MA 113 [*]</td>
<td>Calculus I</td>
</tr>
<tr>
<td>PHYS 231 [*]</td>
<td>General University Physics I</td>
</tr>
<tr>
<td>PHYS 241 [*]</td>
<td>General University Physics I Lab</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 103 [*]</td>
<td>Engineering Exploration II</td>
</tr>
<tr>
<td>CIS/WRD 111 [*]</td>
<td>Comp &amp; Comm II</td>
</tr>
<tr>
<td>MA 114 [*]</td>
<td>Calculus II</td>
</tr>
<tr>
<td>CHE 105 [*]</td>
<td>General College Chemistry I</td>
</tr>
<tr>
<td>BIOS 148 [*]</td>
<td>Introduction to Biology I</td>
</tr>
</tbody>
</table>

### Notes

[*] Courses required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following pre-major courses with at least a 2.5 GPA:
- BIO 148, BIO 152, BME 201, CHE 105, CIS 110 / WRD 110, CIS 111 / WRD 111, EGR 101, EGR 102, EGR 103, MA 113, MA 114, MA 213, PHY 231, PHY 241, PHY 232 and PHY 242. If the course is repeated the best grade will be used for calculation of GPA in the pre-major courses required for Engineering Standing.


[#] Transfer students who declare a major and meet the prerequisites will take EGR 215 "Introduction to the Practice of Engineering for Transfer Students" in place of EGR 101 and EGR 103. EGR 215 will fulfill UK Core: Arts & Creativity requirement.

[∞] Graduation Composition and Communication Requirement (GCCR) course.


# BIOSYSTEMS ENGINEERING

## Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 101[*] Engineering Exploration I</td>
<td>1</td>
</tr>
<tr>
<td>EGR 102 Fundamentals of Egr Computing</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 110 [<em>] [</em>] [*]</td>
<td>3</td>
</tr>
<tr>
<td>MA 113 [*] Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 105 [*] General College Chemistry I</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 103 [¶] Engineering Exploration II</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 111 (¶) Comp &amp; Comm II</td>
<td>3</td>
</tr>
<tr>
<td>MA 114 [*] Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHY 231 [*] General University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHY 241 General University Physics I Lab</td>
<td>1</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

Transfer students who declare a major and meet the prerequisites will take EGR 215 "Introduction to the Practice of Engineering for Transfer Students" in place of EGR 101 and EGR 103. EGR 215 will fulfill UK Core: Arts & Creativity requirement.

A minimum of 9 hours are required from the Biosystems Engineering core courses: BAE 417, BAE 427, BAE 437, and BAE 447.

## Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAE 200[*] Principles of Biosystems Engr</td>
<td>3</td>
</tr>
<tr>
<td>BIO 148 Introductory Biology I</td>
<td>3</td>
</tr>
<tr>
<td>MA 213 [*] Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>PHY 232 General University Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 242 General University Physics Lab</td>
<td>1</td>
</tr>
<tr>
<td>CE 106 Computer Graphics and Communic.</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 214 Calculus IV</td>
<td>3</td>
</tr>
<tr>
<td>BAE 202 Statistical Inferences for Biosys Engr</td>
<td>3</td>
</tr>
<tr>
<td>ME 220 Engineering Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>EM 221 Statics</td>
<td>3</td>
</tr>
<tr>
<td>CHE 107 General College Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

[¶] A minimum of 9 hours are required from the Biosystems Engineering core courses: BAE 417, BAE 427, BAE 437, and BAE 447.

## Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAE 301 Economic Analysis for Biosystems</td>
<td>2</td>
</tr>
<tr>
<td>ME 330 Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>EE 305 Electrical Circuits and Electronics</td>
<td>3</td>
</tr>
<tr>
<td>EM 313 Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>BIO 152 Principles of Biology II</td>
<td>3</td>
</tr>
<tr>
<td>WRD 204 [=] Technical Writing</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAE 305 OC Circuits and Microelectronics</td>
<td>3</td>
</tr>
<tr>
<td>EM 302 Mechanics of Deformable Solids</td>
<td>3</td>
</tr>
<tr>
<td>BAE 310 Heat &amp; Mass Transf in Biosystems Engr</td>
<td>3</td>
</tr>
<tr>
<td>Core Elective [1]</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

[=} Graduation Composition and Communication Requirement (GCCR) course.

## Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAE 402 Biosystems Engineering Design I</td>
<td>2</td>
</tr>
<tr>
<td>BAE 400 Senior Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Core/Tech Elect [1]</td>
<td>3</td>
</tr>
<tr>
<td>Core/Tech Elect [1]</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAE 403 Biosystems Engineering Design II</td>
<td>2</td>
</tr>
<tr>
<td>BAE 502 Modeling of Bio Systems</td>
<td>3</td>
</tr>
<tr>
<td>Core/Tech Elect [1]</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

[1] Courses required for Engineering Standing. A cumulative UK GPA of at least a 2.5 and successful completion of all pre-major courses. Successful completion of the following pre-major courses with at least a 2.5 GPA: CHE 105, CIS/WRD 110, MA 113, MA 114, MA 213, and PHY 231. Completion of BAE 200 with a grade of C or better. If a course is repeated the best grade will be used for calculation of GPA in the pre-major courses required for Engineering Standing.


[3] Transfer students who declare a major and meet the prerequisites will take EGR 215 "Introduction to the Practice of Engineering for Transfer Students" in place of EGR 101 and EGR 103. EGR 215 will fulfill UK Core: Arts & Creativity requirement.

[4] A minimum of 9 hours are required from the Biosystems Engineering core courses: BAE 417, BAE 427, BAE 437, and BAE 447.

A minimum of 9 hours (technical electives) are to be taken in addition to the 9 core hours selected by the student. The technical electives allow the student an opportunity concentration or gain depth in one or more of the various specialty areas of biosystems engineering. The technical electives must be selected from the courses listed below and approved by the student’s academic advisor. Other courses may be considered, each on its individual merit.


### CHEMICAL ENGINEERING

#### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 101[#]</td>
<td>1</td>
<td>EGR 103[#]</td>
<td>2</td>
</tr>
<tr>
<td>EGR 102</td>
<td>2</td>
<td>CIS/WRD 111</td>
<td>3</td>
</tr>
<tr>
<td>CIS/WRD 110 [*][+]</td>
<td>3</td>
<td>MA 114[*]</td>
<td>4</td>
</tr>
<tr>
<td>MA 113 [*]</td>
<td>4</td>
<td>PHY 231 [*]</td>
<td>4</td>
</tr>
<tr>
<td>CHE 105 [*]</td>
<td>4</td>
<td>CHE 111 [*]</td>
<td>1</td>
</tr>
<tr>
<td>CHE 111 [*]</td>
<td>1</td>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note: Transfer students who declare a major and meet the prerequisites will take EGR 215 "Introduction to the Practice of Engineering for Transfer Students" in place of EGR 101 and EGR 103. EGR 215 will fulfill UK Core: Arts & Creativity requirement.

#### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CME 200[*]</td>
<td>3</td>
<td>CME 220</td>
<td>3</td>
</tr>
<tr>
<td>MA 213 [*]</td>
<td>4</td>
<td>MA 214 Calculus IV</td>
<td>MAT 325</td>
</tr>
<tr>
<td>CHE 107 [*]</td>
<td>3</td>
<td>PHY 232</td>
<td>4</td>
</tr>
<tr>
<td>CHE 113 [*]</td>
<td>2</td>
<td>STA 381</td>
<td>3</td>
</tr>
<tr>
<td>MSE 201 Materials Science</td>
<td>3</td>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CME 330</td>
<td>3</td>
<td>CME 006 The Engineering Profession</td>
<td>0</td>
</tr>
<tr>
<td>CME 415</td>
<td>3</td>
<td>CME 420 Process Modeling in Chem Eng</td>
<td>3</td>
</tr>
<tr>
<td>CHE 230 Organic Chemistry I</td>
<td>3</td>
<td>CME 425 Heat and Mass Transfer</td>
<td>4</td>
</tr>
<tr>
<td>CHE 231 Organic Chemistry I Lab</td>
<td>1</td>
<td>CME 432 Chemical Engineering Laboratory I</td>
<td>2</td>
</tr>
<tr>
<td>CHE 446G Physical Chemistry for Engineers</td>
<td>3</td>
<td>CME 232 Organic Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>WRD 204 [=] Technical Writing</td>
<td>3</td>
<td>Eng/Sci Elect [1]</td>
<td>3</td>
</tr>
</tbody>
</table>

#### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CME 006 The Engineering Profession</td>
<td>0</td>
<td>CME 006 The Engineering Profession</td>
<td>0</td>
</tr>
<tr>
<td>CME 455 Chemical Eng Process Design I</td>
<td>2</td>
<td>CME 462 Process Control</td>
<td>3</td>
</tr>
<tr>
<td>Eng/Sci Elect [1]</td>
<td>3</td>
<td>UK Core</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

---

[*] Courses required for Engineering Standing. A cumulative UK GPA of at least 2.5 and successful completion of all pre-major courses. Successful completion of the following pre-major courses with at least a 2.5 GPA: CHE 105, CHE 107, CHE 111, CHE 113, CIS/WRD 110, MA 113, MA 114, MA 213, and PHY 231. Completion of CME 200 with a grade of C or better. If a course is repeated the best grade will be used for calculation of GPA in the courses required for Engineering Standing.


[*][+] Transfer students who declare a major and meet the prerequisites will take EGR 215 "Introduction to the Practice of Engineering for Transfer Students" in place of EGR 101 and EGR 103. EGR 215 will fulfill UK Core: Arts & Creativity requirement.

[=] Graduation Composition and Communication Requirement (GCCR) course.

[1] Engineering/Science Elective Structure. Students must select four courses as follows:

1. Chemical Engineering elective (CME 395, 404G, 505, 515, 523, 542, 552, 554, 556, 570, 573, 580, 599)
2. Science/math elective (totaling three or more credit hours) that is not a more elementary version of a required course. [Students may combine multiple qualifying courses that total 3 credits (e.g. pre-medical students may wish to combine PHY 241, 242 and CHE 233)]
   - b. Chemistry (CHE 226 (CHE 340 & 340L), 250, 510 and above)
   - c. Biology (BIO 148 (BIO 150 and 150L) and above)
   - d. Physics (PHY 241 (PHY 220) and above)
   - e. Other courses by approval of Director of Undergraduate Studies
3. Engineering elective (level 300 and above) that does not significantly duplicate content in a core chemical engineering course (e.g. ME 330) OR a CME Elective (CME 395 & above).
4. Chemical engineering elective (CME 395 and above) OR one engineering elective (level 300 and above) OR one science/math elective as described above.

*CME 395 (3 credits) may be used to satisfy only one elective requirement.
<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 101 [6]</td>
<td>Engineering Exploration I</td>
<td>1</td>
</tr>
<tr>
<td>EGR 102</td>
<td>Fundamentals of Egr Computing</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 110 [*][a]</td>
<td>Comp &amp; Comm I</td>
<td>3</td>
</tr>
<tr>
<td>MA 113[*]</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 105[*]</td>
<td>General College Chemistry I</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 103 [*][#]</td>
<td>Engineering Exploration II</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 111[a]</td>
<td>Comp &amp; Comm II</td>
<td>3</td>
</tr>
<tr>
<td>MA 114[*]</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHY 233[*]</td>
<td>General University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHY 244[*]</td>
<td>General University Physics I Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 211 [*]</td>
<td>Surveying</td>
<td>4</td>
</tr>
<tr>
<td>CHE 107[*]</td>
<td>General College Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>EM 221[*]</td>
<td>Statics</td>
<td>3</td>
</tr>
<tr>
<td>MA 213[*]</td>
<td>Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>CE 106 [*]</td>
<td>Comp Graphics &amp; Communications</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM 302</td>
<td>Mechanics of Deformable Solids</td>
<td>3</td>
</tr>
<tr>
<td>MNG 303</td>
<td>Deformable Solids Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>MA 214</td>
<td>Calculus IV</td>
<td>3</td>
</tr>
<tr>
<td>PHY 232</td>
<td>General University Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 242</td>
<td>General University Physics Lab</td>
<td>1</td>
</tr>
<tr>
<td>STA 381 or 296</td>
<td>Engr Stats or Stat Methods &amp; Motivation</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRD 204 (**)</td>
<td>Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>EES 220</td>
<td>Principles of Physical Geology</td>
<td>4</td>
</tr>
<tr>
<td>CE 303</td>
<td>Intro to Construction Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 341</td>
<td>Intro to Fluid Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>CE 381</td>
<td>Civil Engineering Materials I</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 331</td>
<td>Transportation Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 351</td>
<td>Intro to Environmental Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CE 482</td>
<td>Structural Analysis and Design</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 461G</td>
<td>Water Resources Engineering</td>
<td>4</td>
</tr>
<tr>
<td>CE 471G</td>
<td>Soil Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>Design Elective [4]</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>UK Core</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE 401</td>
<td>Seminar</td>
<td>1</td>
</tr>
<tr>
<td>CE 429</td>
<td>Civil Engineering Systems Design</td>
<td>3</td>
</tr>
<tr>
<td>Design Elective [4]</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>UK Core</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

[*] Courses required for Engineering Standing. A cumulative UK GPA of at least a 2.5 and successful completion of all pre-major courses. Successful completion of the following pre-major courses with at least a 2.5 GPA: CE 106, CE 211, CHE 105, CHE 107, CIS/WRD 110, EGR 103, EM 221, MA 113, MA 114, MA 213, PHY 231 and PHY 241 and a C or better in each course. If a course is repeated the best grade will be used for calculation of GPA in the courses required for Engineering Standing.


[3] Technical Elective is chosen from any of the courses at the 300-level or above that carry a CE prefix and in which a student is qualified to enroll, exclusive of required courses. Engineering elective courses are typically taught once a year.

[4] Students are required to select two design electives from different areas. Choose from: CE 508, CE 531 or CE 533, CE 534, CE 549, CE 551 or 599, CE 579, CE 589. Design elective courses are typically taught once a year.
<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>First Semester</th>
<th>Hours</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 101 [*]</td>
<td>Engineering Exploration I</td>
<td>1</td>
<td>EGR 103 [*]</td>
<td>Engineering Exploration II</td>
</tr>
<tr>
<td>EGR 102</td>
<td>Fundamentals of Egr Computing</td>
<td>2</td>
<td>CIS/WRD 111 [*]</td>
<td>Comp &amp; Comm II</td>
</tr>
<tr>
<td>CIS/WRD 110 [*][a]</td>
<td>Comp &amp; Comm I</td>
<td>3</td>
<td>MA 114</td>
<td>Calculus II</td>
</tr>
<tr>
<td>MA 113</td>
<td>Calculus I</td>
<td>4</td>
<td>PHY 231 [*]</td>
<td>General University Physics I</td>
</tr>
<tr>
<td>CHE 105 [*]</td>
<td>General College Chemistry I</td>
<td>4</td>
<td>PHY 241</td>
<td>General University Physics I Lab</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CS 215 [*]</td>
<td>Intro to Prog Dsgn, Alatr &amp; Prob Solv</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>First Semester</th>
<th>Hours</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 213</td>
<td>Calculus III</td>
<td>4</td>
<td>MA 214</td>
<td>Calculus IV/</td>
</tr>
<tr>
<td>PHY 232</td>
<td>General University Physics</td>
<td>4</td>
<td>PHY 221</td>
<td>Circuits I</td>
</tr>
<tr>
<td>PHY 242</td>
<td>General University Physics Lab</td>
<td>1</td>
<td>CPE 287</td>
<td>Intro to Embedded Systems</td>
</tr>
<tr>
<td>CS 216 [*]</td>
<td>Intro to Software Engr Techniques</td>
<td>3</td>
<td>CS 270</td>
<td>Systems Programming</td>
</tr>
<tr>
<td>CPE 200</td>
<td>Comp Engr Sophomore Seminar</td>
<td>1</td>
<td>CS 275</td>
<td>Discrete Mathematics</td>
</tr>
<tr>
<td>CPE 282 [*]</td>
<td>Digital Logic Design</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>First Semester</th>
<th>Hours</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 223</td>
<td>AC Circuits</td>
<td>4</td>
<td>EE 421G</td>
<td>Signals and Systems</td>
</tr>
<tr>
<td>CS 315</td>
<td>Algorithm Design and Analysis</td>
<td>3</td>
<td>EE 461G</td>
<td>Introduction to Electronics</td>
</tr>
<tr>
<td>UK Core</td>
<td></td>
<td>3</td>
<td>UK Core</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>First Semester</th>
<th>Hours</th>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPE 490[1][+]</td>
<td>ECE Capstone Design I</td>
<td>3</td>
<td>CPE 491[1]</td>
<td>ECE Capstone Design II</td>
</tr>
<tr>
<td>UK Core</td>
<td></td>
<td>3</td>
<td>UK Core</td>
<td></td>
</tr>
</tbody>
</table>

[*] Courses required for Engineering Standing. A cumulative UK GPA of at least a 2.5 and successful completion of all pre-major courses. Successful completion of the following pre-major courses with at least a 2.5 GPA: CHE 105, CIS/WRD 110, CS 215, CS 216, EE/CPE 282, and PHY 231. If a course is repeated, the best grade will be used for calculation of GPA in the courses required for Engineering Standing.


[#] Transfer students who declare a major and meet the prerequisites will take EGR 215 “Introduction to the Practice of Engineering for Transfer Students” in place of EGR 101 and EGR 103. EGR 215 will fulfill UK Core: Arts & Creativity requirement.

[+]= Graduation Composition and Communication Requirement (GCCR) course.

[1] CPE 480 is only taught in the spring semester. CPE 490 is only taught in the spring semester.

[2] Technical electives may be selected from upper-division engineering, mathematics, statistics, computer science, physics, or other technically-related fields excluding more elementary version of required courses. To be selected in consultation with academic advisor. If a student wishes to use CS 499 instead of CPE 490 and CPE 491 to fulfill the GCCR and senior design requirements, the student must receive approval from the DUS to select an additional technical elective that supports the proposed CS 499 project.

[3] 400 level CS courses and 500 level CPE courses with emphasis in the computer engineering area and excluding EE 595. To be selected in consultation with academic advisor.

[4] Hardware electives are senior level courses in the CPE or EE disciplines and shall be selected from the following list and/or selected in consultation with academic advisor:

EE 582 Hardware Description Languages and Programmable Logic
CPE 584 Introduction of VLSI Design and Testing
CPE 585 Fault Tolerant Computing
CPE 586 Communication and Switching Networks

[5] Software electives are senior level courses in the CPE or CS disciplines and shall be selected from the following list and/or selected with academic advisor:

CS 441G Compilers for Algorithmic Languages
CS 471G Networking and Distributed Operating Systems
CS 570 Modern Operating Systems
CPE 588 Real-Time Digital Systems
## Computer Science

### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 101 [#]</td>
<td>1</td>
</tr>
<tr>
<td>EGR 102</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 110 [*]</td>
<td>3</td>
</tr>
<tr>
<td>MA 113</td>
<td>4</td>
</tr>
<tr>
<td>CHE 105 or Gen Col Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>PHY 251 or Gen Univ Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHY 241</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 103 [*]</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 111 (a)</td>
<td>3</td>
</tr>
<tr>
<td>MA 114 [*]</td>
<td>4</td>
</tr>
<tr>
<td>PHY 231 or Gen Univ Physics I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 105</td>
<td>4</td>
</tr>
<tr>
<td>CS 215 [*]</td>
<td>4</td>
</tr>
</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 213 Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>CS 216 [*] Intro to Software Engr Techniques</td>
<td>3</td>
</tr>
<tr>
<td>EE 280 Design of Logic Circuits</td>
<td>3</td>
</tr>
<tr>
<td>CS 275 [*] Discrete Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 213 Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>CS 216 [*] Intro to Software Engr Techniques</td>
<td>3</td>
</tr>
<tr>
<td>EE 280 Design of Logic Circuits</td>
<td>3</td>
</tr>
<tr>
<td>CS 275 [*] Discrete Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 371 Intro to Computer Networking</td>
<td>3</td>
</tr>
<tr>
<td>CS/MA 321 Intro to Numerical Meth</td>
<td>3</td>
</tr>
<tr>
<td>or MA 322 Matrix Algebra</td>
<td>3</td>
</tr>
<tr>
<td>STA 381 Engr Statistics: A Conceptual Approach</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 375 Logic and Theory of Computing</td>
<td>3</td>
</tr>
<tr>
<td>CS Elective [2]</td>
<td>3</td>
</tr>
<tr>
<td>STA 381 Engr Statistics: A Conceptual Approach</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 498 Software Engr for Senior Project</td>
<td>3</td>
</tr>
<tr>
<td>Free Elective [4]</td>
<td>4</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 498 Software Engr for Senior Project</td>
<td>3</td>
</tr>
<tr>
<td>Free Elective [3]</td>
<td>3</td>
</tr>
</tbody>
</table>

### Notes

1. Courses required for Engineering Standing. A cumulative UK GPA of at least a 2.5 and successful completion of all pre-major courses. Successful completion of the following pre-major courses with at least a 2.5 GPA: CS 215, CS 216, CS 275, and MA 114. If a course is repeated, the best grade will be used for calculation of GPA in the courses required for Engineering Standing.


3. Transfer students who declare a major and meet the prerequisites will take EGR 215 "Introduction to the Practice of Engineering for Transfer Students" in place of EGR 101 and EGR 103. EGR 215 will fulfill UK Core: Arts & Creativity requirement.

4. Graduation Composition and Communication Requirement (GCCR) course.

5. Any natural science course excluding more elementary versions of completed required courses.

6. Computer Science Elective (18 credit hours) include 300-level and above computer science courses with at least three to be selected from: CS 335, CS 378, CS 405G, CS 441G, CS 450G, CS 460G and CS 463G. Students are encouraged to take advantage of special topics courses, cooperative education, independent studies and undergraduate research.

7. Technical Electives - include any 300-level and above courses in computer science, electrical engineering, mathematics and business and economics. MA 214 (MAT 325) is also an acceptable technical elective. Cooperative education credit may be used to satisfy this requirement.

8. Elective - including one Free Elective and Non-Technical Elective. As least two of the electives (6 credits) cannot be in computer science, mathematics, science or engineering. Free Elective (3 credits) can be any course that carries college credit and is not a more elementary version of a required courses. Note: at least 128 credit hours; a foreign language requirement.

9. Science elective - must be selected from either UK Core Natural Science or Social Science or approved list or by consent of academic advisor.
# Electrical Engineering

## Pathway for Northern KY
Transfers - Fall 2020

### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 101 [*] Engineering Exploration I</td>
<td>1</td>
</tr>
<tr>
<td>EGR 102 Fundamentals of Egr Computing</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 110 [*] Comp &amp; Comm I</td>
<td>3</td>
</tr>
<tr>
<td>MA 113 Calculus I MAT 227 &amp; 228, or MAT 129</td>
<td>4</td>
</tr>
<tr>
<td>PHY 231 (*) General University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHY 241 General University Physics I Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 103 [*] Engineering Exploration II</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 111 (a) Comp &amp; Comm II</td>
<td>3</td>
</tr>
<tr>
<td>MA 114 Calculus II MAT 227 &amp; 228, or MAT 129</td>
<td>4</td>
</tr>
<tr>
<td>CHE 105 (*) General College Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CS 215 (*) Intro to Prog Dsgn, Abstrac &amp; Prob Solvg</td>
<td>4</td>
</tr>
</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 213 Calculus III MAT 326</td>
<td>4</td>
</tr>
<tr>
<td>PHY 232 General University Physics II PHY 222</td>
<td>4</td>
</tr>
<tr>
<td>PHY 242 General University Physics Lab PHY 222</td>
<td>1</td>
</tr>
<tr>
<td>EE 211 [*] Circuits I</td>
<td>4</td>
</tr>
<tr>
<td>EE/CPE 282 [*] Digital Logic Design</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 214 Calculus IV MAT 325</td>
<td>3</td>
</tr>
<tr>
<td>EE 223 AC Circuits</td>
<td>4</td>
</tr>
<tr>
<td>EE/CPE 287 Introduction to Embedded Systems</td>
<td>4</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 415G Electromechanics</td>
<td>3</td>
</tr>
<tr>
<td>EE 421G Signals and Systems</td>
<td>3</td>
</tr>
<tr>
<td>EE Lab Elective [4]</td>
<td>2</td>
</tr>
<tr>
<td>EE 461G Introduction to Electronics</td>
<td>3</td>
</tr>
<tr>
<td>MA 320/STA 381 Intro Probability/Engineering Stats</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 468G Intro to Engineering Electromagnetics</td>
<td>4</td>
</tr>
<tr>
<td>EE Lab Elective [4]</td>
<td>2</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE/CPE 490 [*] ECE Capstone Design I</td>
<td>3</td>
</tr>
<tr>
<td>EE Tech Elect [6]</td>
<td>3</td>
</tr>
<tr>
<td>EE Tech Elect (6)</td>
<td>3</td>
</tr>
<tr>
<td>Math/Stat Elective [1]</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE/CPE 491 [*] ECE Capstone Design II</td>
<td>3</td>
</tr>
<tr>
<td>EE Tech Elect [6]</td>
<td>3</td>
</tr>
<tr>
<td>EE Tech Elect (6)</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

[*] Courses required for Engineering Standing. A cumulative UK GPA of at least a 2.5 and successful completion of all pre-major courses. Successful completion of the following pre-major courses with at least a 2.5 GPA: CIS/WRD 110, CHE 105, CS 215, EE 211, EE/CPE 282, and PHY 231. If a course is repeated, the best grade will be used for calculation of GPA in the courses required for Engineering Standing.


[6] Transfer students who declare a major and meet the prerequisites will take EGR 215 "Introduction to the Practice of Engineering for Transfer Students" in place of EGR 101 and EGR 103. EGR 215 will fulfill UK Core: Arts & Creativity requirement.

[+] Graduation Composition and Communication Requirement (GCCR) course.

[1] Math/Statistics Elective: Any upper-division (300-level or higher) math or statistics course excluding MA 308 and MA 310 (MAT 324) (3 credit hours total).

[2] Engineering/Science Electives: Any engineering, physics, computer science, or math course at the 200-level or higher, other than an electrical engineering course and excluding MA 308, MA 310, and more elementary versions of required courses (6 credit hours total). Cooperative education credit may not be used to satisfy this requirement.

[3] Technical elective may be selected from upper-division (300-level or higher) engineering, mathematics, statistics, computer science, physics, or other technically-related fields excluding MA 308, MA 310 (MAT 324), EE 305 and more elementary versions of required courses, to be selected in consultation with the academic advisor (3 credit hours total). Cooperative education credit may not be used to satisfy this requirement.


[5] EE/CPE 480 is only taught in the fall semester. EE/CPE 491 is only taught in the spring semester.

## MATериалС ENGINEERING  
### Freshman Year
<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 101 [#] Engineering Exploration I</td>
<td>1</td>
</tr>
<tr>
<td>EGR 102 Fundamentals of Egr Computing</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 110 <a href="a">*</a> Comp &amp; Comm I</td>
<td>3</td>
</tr>
<tr>
<td>MA 113[*] Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 105[*] General College Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 111[*] General College Chemistry I Lab</td>
<td>1</td>
</tr>
<tr>
<td>MA 114[*] Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHY 233[*] General University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>PHY 241[*] General University Physics I Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

### Second Semester
<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 103 [#] Engineering Exploration II</td>
</tr>
<tr>
<td>CIS/WRD 111 (a) Comp &amp; Comm II</td>
</tr>
<tr>
<td>MA 114[*] Calculus II</td>
</tr>
<tr>
<td>PHY 233[*] General University Physics I</td>
</tr>
<tr>
<td>UK Core</td>
</tr>
</tbody>
</table>

### Sophomore Year
<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 213[*] Calculus III</td>
</tr>
<tr>
<td>MSE 201 [*] Materials Science I</td>
</tr>
<tr>
<td>MSE 202 Materials Science Laboratory</td>
</tr>
<tr>
<td>CHE 107[*] General College Chemistry I</td>
</tr>
<tr>
<td>CHE 113[*] General College Chemistry II Lab</td>
</tr>
<tr>
<td>EM 221 Statics</td>
</tr>
</tbody>
</table>

### Junior Year
<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 401G Metal and Alloys</td>
</tr>
<tr>
<td>MSE 404G Polymeric Materials</td>
</tr>
<tr>
<td>CME 200 Process Principles</td>
</tr>
<tr>
<td>EM 302 Mechanics of Deformable Solids</td>
</tr>
<tr>
<td>STA 381 Engineering Statistics A Concept App</td>
</tr>
<tr>
<td>UK Core</td>
</tr>
</tbody>
</table>

### Senior Year
<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE 408 Materials Laboratory II</td>
</tr>
<tr>
<td>MSE 436 Material Failure Analysis</td>
</tr>
<tr>
<td>MSE 470 Application of Maths Engr to Dsgn Probs</td>
</tr>
<tr>
<td>MSE 585 Materials Characterization Techniques</td>
</tr>
<tr>
<td>EE 350 Electrical Circuits and Electronics</td>
</tr>
<tr>
<td>Technical Elect [1]</td>
</tr>
</tbody>
</table>

---

### Notes

* Courses required for Engineering Standing. A cumulative UK GPA of at least a 2.5 and successful completion of all pre-major courses. Successful completion of the following pre-major courses with at least a 2.5 GPA: CHE 105, CHE 107, CHE 111, CHE 113, CIS/WRD 110, MA 113, MA 114, MA 213, PHY 231, and PHY 241. Completion of MSE 201 with a grade of C or better. If a course is repeated, the best grade will be used for calculation of GPA in the courses required for Engineering Standing.


* Transfer students who declare a major and meet the prerequisites will take EGR 205 "Introduction to the Practice of Engineering for Transfer Students" in place of EGR 101 and EGR 103. EGR 205 will fulfill UK Core: Arts & Creativity requirement.

* Technical Electives - total of 6 credit hours and must be chosen. Technical electives are to be selected from a technical discipline, with approval from the Director of Undergraduate Studies. At least 3 credit hours must come from a course with a MSE prefix. MSE 395 (research) may count for one elective, but not both. Recommended technical electives include but are not limited to: MSE 395, 508, 531, 552, 554, 556, 569, 596; BME 488; CHE 580; CME 542, 599; MA 322, 422, 432G; ME/MFS 503
### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 101 [*][#] Engineering Exploration I</td>
<td>1</td>
</tr>
<tr>
<td>EGR 102 [*] Fundamentals of Egr Computing</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 110 (s) Comp &amp; Comm I</td>
<td>3</td>
</tr>
<tr>
<td>MA 113[*] Calculus I MAT 227 &amp; 226, or MAT 129</td>
<td>4</td>
</tr>
<tr>
<td>PHY 231[*] General University Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHY 241[*] General University Physics I Lab</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 103 [*][#] Engineering Exploration II</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 111 [*] Comp &amp; Comm II</td>
<td>3</td>
</tr>
<tr>
<td>MA 114[*] Calculus II MAT 227 &amp; 226, or MAT 129</td>
<td>4</td>
</tr>
<tr>
<td>CHE 105[*] General College Chemistry I</td>
<td>4</td>
</tr>
</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 213[*] Calculus III MAT 320</td>
<td>4</td>
</tr>
<tr>
<td>PHY 232 [*] General University Physics II PHY 222</td>
<td>4</td>
</tr>
<tr>
<td>PHY 242 [*] General University Physics Lab PHY 222</td>
<td>1</td>
</tr>
<tr>
<td>EM 221 [*] Statics PHY 305</td>
<td>3</td>
</tr>
<tr>
<td>ME 205 Computer Aided Engr Graphics</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 214 Calculus IV MAT 320</td>
<td>3</td>
</tr>
<tr>
<td>ME 220 Engineering Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>ME 251 Intro to Mtls &amp; Mfg Processes</td>
<td>3</td>
</tr>
<tr>
<td>EM 313 Dynamics PHY 310</td>
<td>3</td>
</tr>
<tr>
<td>CHE 107 General College Chemistry II CHE 151</td>
<td>3</td>
</tr>
<tr>
<td>UK Core [%]</td>
<td>3</td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM 302 Mechanics of Deformable Solids</td>
<td>3</td>
</tr>
<tr>
<td>EE 305 Electrical Circuits and Electronics</td>
<td>3</td>
</tr>
<tr>
<td>ME 330 Fluid Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>ME 340 Intro to Mechanical Systems</td>
<td>3</td>
</tr>
<tr>
<td>WRD 204 [*] Technical Writing</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 310 Engineering Experimentation I</td>
<td>3</td>
</tr>
<tr>
<td>ME 321 Engineering Thermodynamics II</td>
<td>3</td>
</tr>
<tr>
<td>ME 325 Elements of Heat Transfer</td>
<td>3</td>
</tr>
<tr>
<td>ME 344 Mechanical Design</td>
<td>3</td>
</tr>
<tr>
<td>Math Elective [2]</td>
<td>3</td>
</tr>
</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 411 ME Capstone Design I</td>
<td>3</td>
</tr>
<tr>
<td>ME 411 Engineering Experimentation II</td>
<td>3</td>
</tr>
<tr>
<td>ME 440 Design of Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ME 501 Mech Desgn w/ Finite Element Meth</td>
<td>3</td>
</tr>
<tr>
<td>Technical Elect [1]</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 412 ME Capstone Design II</td>
<td>3</td>
</tr>
<tr>
<td>Technical Elect [1]</td>
<td>3</td>
</tr>
<tr>
<td>Technical Elect [1]</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

[*] Courses required for Engineering Standing. A cumulative UK GPA of at least a 2.5 and successful completion of all pre-major courses. Successful completion of the following pre-major courses with at least a 2.5 GPA: CHE 105, CIS/WRD 111, EGR 101, EGR 102, GR 103, EM 221, MA 113, MA 114, MA 213,PHY 231, PHY 241, PHY 232, and PHY 242 and a C or better in each course. If a course is repeated, the best grade will be used for calculation of GPA in the courses required for Engineering Standing.


Students are allowed one non-technical Mechanical Engineering Elective: BAE 502, 515, 516; BME 405, 472, 485, 488, 508, 515, 530, 540, 579, 580; EGR 537, 540, 542, 548, 553; MFS 509, MNG/MFS 520, MFS 525, 599; MGE 201 (EGR 281).

## MINING ENGINEERING

### Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 101 [9] Engineering Exploration I</td>
<td>1</td>
</tr>
<tr>
<td>EGR 102 Fundamentals of Egr Computing</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 110 [*] [a] Comp &amp; Comm I</td>
<td>3</td>
</tr>
<tr>
<td>MA 113[*] Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 105[*] General College Chemistry I</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EGR 103[*] Engineering Exploration II</td>
<td>2</td>
</tr>
<tr>
<td>CIS/WRD 111 [a] Comp &amp; Comm II</td>
<td>3</td>
</tr>
<tr>
<td>MA 114[*] Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>PHY 231[*] General University Physics I</td>
<td>4</td>
</tr>
<tr>
<td>CHE 111 Gen Col Chemistry I Lab</td>
<td>1</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EES 220 Principles of Physical Geology</td>
<td>4</td>
</tr>
<tr>
<td>EM 221 Statics</td>
<td>3</td>
</tr>
<tr>
<td>MA 213[*] Calculus III</td>
<td>4</td>
</tr>
<tr>
<td>MNG 201 Mining Engineering Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>PHY 232 General University Physics</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EES 230 Fundamentals for Geology I</td>
<td>3</td>
</tr>
<tr>
<td>EM 302 Mechanics of Deformable Solids</td>
<td>3</td>
</tr>
<tr>
<td>MA 214 Calculus IV</td>
<td>3</td>
</tr>
<tr>
<td>MNG 291 Elements of Mine Design</td>
<td>3</td>
</tr>
<tr>
<td>MNG 303 Deformable Solids Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>MNG 331 Explosives and Blasting</td>
<td>2</td>
</tr>
<tr>
<td>MNG 322 Mine Safety &amp; Health Manage &amp; Process</td>
<td>2</td>
</tr>
</tbody>
</table>

### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM 313 Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>MNG 211 Mine Surveying</td>
<td>2</td>
</tr>
<tr>
<td>MNG 301 Minerals Processing</td>
<td>3</td>
</tr>
<tr>
<td>MNG 335 [*] Intro to Mine Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>MNG 463 Surface Mine Design</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNG 311 Electrical Circuits &amp; Mining Machinery</td>
<td>3</td>
</tr>
<tr>
<td>CE 341 [*] Intro to Fluid Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>MNG 371 [*] Prof Development of Mining Engineers</td>
<td>3</td>
</tr>
<tr>
<td>MNG 435 Mine Systems Engr and Economics</td>
<td>3</td>
</tr>
<tr>
<td>MNG 551 Rock Mechanics</td>
<td>4</td>
</tr>
</tbody>
</table>

### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNG 332 Mine Plant Machinery</td>
<td>3</td>
</tr>
<tr>
<td>MNG 341 Mine Ventilation</td>
<td>3</td>
</tr>
<tr>
<td>MNG 351 Underground Mine Design</td>
<td>3</td>
</tr>
<tr>
<td>MNG 591 Mine Design Project I</td>
<td>1</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNG 592 Mine Design Project II</td>
<td>3</td>
</tr>
<tr>
<td>MNG/BAE 535 Environ Contl Syst Desgn &amp; Reclama</td>
<td>3</td>
</tr>
<tr>
<td>Min Pro Tech Elect[1]</td>
<td>3</td>
</tr>
<tr>
<td>UK Core</td>
<td>3</td>
</tr>
</tbody>
</table>

[*] Courses required for Engineering Standing. A cumulative UK GPA of at least a 2.5 and successful completion of all pre-major courses. Successful completion of the following pre-major courses with at least a 2.5 GPA: CIS/WRD 110, CHE 105, MA 113, MA 114, MA 213, and PHY 231. If a course is repeated, the best grade will be used for calculation of GPA in the pre-major courses.


[9] Transfer students who declare a major and meet the prerequisites will take EGR 215 *Introduction to the Practice of Engineering for Transfer Students* in place of EGR 101 and EGR 103. EGR 215 will fulfill UK Core: Arts & Creativity requirement.

[*] Graduate Composition and Communication Requirement (GCCCR) course.

[1] Offered only in the Spring semester for Mining students.

[3] Technical Electives: These courses must be chosen with the approval of the student’s advisor to ensure that the curriculum includes sufficient engineering design content. Students are required to select their technical elective from the departmental courses listed below: MNG 511, 531, 541, 552, 555, 561, 575, 580, 585, 599; MNG/MFS 520.

[2] MNG 335 satisfies the Statistical Inferential Reasoning requirement in the UK Core.