### REQUIRED COURSES WITHIN THE ENGINEERING COLLEGE

#### COURSE TITLE | NUMBER | OFF. HRS. | PREREQUISITES
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**Engineering Physics Core Courses (44 hrs)**
Orientation*a | ENGR 100 | 1 | **Admission to the College of Engineering**
Properties of Materials | CME 260 | 3 | CHEM 112 and MATH 181 and PHYS 141
Introduction to Computing and Programming | CS 107 | 4 | Credit or concurrent registration in MATH 180
Introduction to Electrical and Computer Eng. | ECE 115 | 4 | Credit or concurrent registration in MATH 180
Circuit Analysis | ECE 225 | 4 | Credit or concurrent registration in MATH 180
Discrete and Continuous Signals and Systems | ECE 310 | 3 | MATH 220 & cr. or conc. reg. in ECE 225; or cr. or conc. reg. in ECE 210
Introduction to Electromagnetics and Applications | ECE 322 | 4 | ECE 225
Solid-State Device Theory | ECE 346 | 4 | MATH 220; gr. of C or better in ECE 115, and a gr. of C or better in PHYS 142
Senior Design I | ECE 396 | 2 | ENGL 161; and senior standing
Senior Design II | ECE 397 | 2 | ECE 396
& Introduction to Antennas and Wireless Propagation | ECE 421 | 3 | ECE 225 and ECE 322
Nanoelectronics | ECE 440 | 3 | MATH 346; or consent of the instructor
Molecular Biophysics of the Cell | Bio/Phys 450 | 4 | Phys 245 or the equivalent; or approval of the department.
Fluid Mechanics | ME 211 | 4 | PHYS 141 and MATH 220
Professional Development Seminar | ECE 499 | 0 | Open only to seniors; and approval of the dept. Must be taken in the student's last semester of study.

#### Technical Electives (9 hrs)
Select 9 semester hours from a list of technical electives available from the advisor. At most, one 200-level course can be used as a technical elective if said course meets the following two criteria: (a) it is a prerequisite for a 300-level or higher course, and (b) it is outside the ECE or PHYS department. These courses should be selected in consultation with the advisor and should be chosen from approved sequences in the following areas. In addition, at most, one course from outside of the major rubric (ECE or PHYS) may be used to meet the technical elective requirement.

- Bioengineering
- Civil and Materials Engineering
- Chemical Engineering Design
- Chemical Engineering, Multiphase Transport Phenomena
- Chemical Engineering, Chemical Processes
- Computer Science
- Electrical and Computer Engineering, Circuits and VLSI
- Electrical and Computer Engineering, Communications and Signal and Processing
- Electrical and Computer Engineering, Solid State, MEMS, and Nanotechnology
- Electromagnetics and Optics
- Mechanical Engineering, Thermal/Fluid Science
- Mechanical Engineering, Mechanical Systems
- Modern Physics

*a Students preparing for the Fundamentals of Engineering Examination, which leads to becoming a Licensed Professional Engineer, are advised to take:

1) CME 201 Statics; and

2) in addition, one of the following:
   a) CME 203 Strength of Materials
   b) CME 260 Properties of Materials
   c) ME 211 Fluid Mechanics I

#### NONENGINEERING AND GENERAL EDUCATION REQUIREMENTS (72 hrs)

#### COURSE TITLE | NUMBER | HRS. | PREREQUISITES
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Academic Writing I: WAPC | ENGL 160 | 3 | Performance on Dept. Placement Test
Academic Writing II: WIR | ENGL 161 | 3 | ENGL 160 or the equivalent
Exploring World Cultures course*a |  | 3 |  
Understanding the Creative Arts course*a |  | 3 |  
Understanding the Past course*a |  | 3 |  
Understanding the Individual and Society course*a |  | 3 |  
Understanding US Society course*a |  | 3 |  
Calculus I*b | MATH 180 | 4 | C or better in MATH 121 or app. perf. on the dept. pl. test
Calculus II*b | MATH 181 | 4 | C or better in MATH 180

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NONENGINEERING AND GENERAL EDUCATION REQUIREMENTS CONTINUED

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Course Code</th>
<th>Credits</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculus III*b</td>
<td>MATH 210</td>
<td>3</td>
<td>C or better in MATH 181</td>
</tr>
<tr>
<td>Introduction to Differential Equations I</td>
<td>MATH 220</td>
<td>3</td>
<td>C or better in MATH 210</td>
</tr>
<tr>
<td>General Physics I (Mechanics)*b</td>
<td>PHYS 141</td>
<td>4</td>
<td>C or better or concurrent registration in MATH 180; or approval of the dept;</td>
</tr>
<tr>
<td>General Physics II (Electricity &amp; Magnetism)*b</td>
<td>PHYS 142</td>
<td>4</td>
<td>Gr. of C or better in MATH 181 &amp; Gr. of C or better in PHYS 141 or consent of</td>
</tr>
<tr>
<td>Computational and Mathematical Methods for the Physical Sciences</td>
<td>PHYS 215</td>
<td>4</td>
<td>Grade of C or better in PHYS 142; or Grade of B or better in PHYS 107 or</td>
</tr>
<tr>
<td>Fundamentals of Modern Quantum Theory</td>
<td>PHYS 240</td>
<td>3</td>
<td>Grade of C or better in MATH 181; and Grade of C or better in PHYS 142;</td>
</tr>
<tr>
<td>Introduction to Vibrations, Waves, and Thermal Physics</td>
<td>PHYS 245</td>
<td>4</td>
<td>Grade of C or better in MATH 181; and Grade of C or better in PHYS 142;</td>
</tr>
<tr>
<td>Quantum Mechanics I</td>
<td>PHYS 411</td>
<td>4</td>
<td>PHYS 215, PHYS 240, PHYS 245; or approval of the department</td>
</tr>
<tr>
<td>Theoretical Mechanics</td>
<td>PHYS 441</td>
<td>4</td>
<td>PHYS 215 and Credit or concurrent registration in PHYS 245; or approval of</td>
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<tr>
<td>Modern Experimental Physics I</td>
<td>PHYS 481</td>
<td>4</td>
<td>PHYS 240; or approval of the department</td>
</tr>
<tr>
<td>Survey of Physics Problems</td>
<td>PHYS 499</td>
<td>1</td>
<td>Gr. of C or better. Req. to grad. with an undergrad. degree in physics. Co-req.</td>
</tr>
<tr>
<td>General Chemistry I Lecture*c</td>
<td>CHEM 122</td>
<td>4</td>
<td>Grade of C or better in CHEM 101 or adequate performance on the UC Chemistry</td>
</tr>
<tr>
<td>General Chemistry I Laboratory*b;c</td>
<td>CHEM 123</td>
<td>1</td>
<td>Gr. of C or better. in CHEM 101; and concurrent registration or Gr. of C or</td>
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</tbody>
</table>

*a-Consult General Education section of the catalog for approved courses in this category;  
*b-Course approved for the Analyzing the Natural World General Education category,  
*c-General Education credit is given for successful completion of both CHEM 122 and CHEM 123.  
**ENGR100 is a one-semester-hour course, but does not count toward the total hours required for graduation.

Mathematics Elective (3 hrs)  
Select one of the following:

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<tr>
<td>Applied Linear Algebra</td>
<td>MATH 310</td>
<td>3</td>
<td>C or better in MATH 181</td>
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<tr>
<td>Complex Analysis with Applications</td>
<td>MATH 417</td>
<td>3</td>
<td>C or better in MATH 210</td>
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<tr>
<td>Applied Differential Equations</td>
<td>MATH 480</td>
<td>3</td>
<td>C or better in MATH 210</td>
</tr>
<tr>
<td>Applied Partial Differential Equations</td>
<td>MATH 481</td>
<td>3</td>
<td>C or better in MATH 220</td>
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