# BACHELOR OF SCIENCE IN CIVIL ENGINEERING ROADMAP

127 Total Units Required  
Minimum Number of Units in Major: 93

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td></td>
<td></td>
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<tr>
<td>CHEM 115 or CHEM 180</td>
<td>General Chemistry I: Essential Concepts of Chemistry or Chemistry for the Energy and the Environment</td>
<td>3-5</td>
</tr>
<tr>
<td>ENGR 100</td>
<td>Introduction to Engineering</td>
<td>1</td>
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<tr>
<td>ENGR 101</td>
<td>Engineering Graphics</td>
<td>1</td>
</tr>
<tr>
<td>MATH 226</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>GE Area A: Written English Comm. (A2)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>GE Area D: U.S. History (D2) or U.S. and California Gov. (D3)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td></td>
<td>15-17</td>
</tr>
<tr>
<td>MATH 227</td>
<td>Calculus II</td>
<td>4</td>
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<tr>
<td>ENGR 271</td>
<td>Introduction to MATLAB</td>
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</tr>
<tr>
<td>PHYS 220 &amp; PHYS 222</td>
<td>General Physics with Calculus I and General Physics with Calculus I Laboratory</td>
<td>4</td>
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<tr>
<td>GE Area A: Oral Comm. (A1)</td>
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</tr>
<tr>
<td>GE Area B: Life Science (B2)</td>
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<tr>
<td>GE Area C: Arts (C1)</td>
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<tr>
<td><strong>Third Semester</strong></td>
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<tr>
<td>ENGR 102</td>
<td>Statics</td>
<td>3</td>
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<tr>
<td>ENGR 200</td>
<td>Materials of Engineering</td>
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<tr>
<td>MATH 228</td>
<td>Calculus III</td>
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<tr>
<td>PHYS 230 &amp; PHYS 232</td>
<td>General Physics with Calculus II and General Physics with Calculus II Laboratory</td>
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<tr>
<td>GE Area A: Written English Comm. (A4)</td>
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<tr>
<td><strong>Fourth Semester</strong></td>
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<tr>
<td>ENGR 201</td>
<td>Dynamics</td>
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<tr>
<td>ENGR 235</td>
<td>Surveying</td>
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<tr>
<td>ENGR 205</td>
<td>Electric Circuits</td>
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<tr>
<td><strong>Fifth Semester</strong></td>
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<tr>
<td>ENGR 300</td>
<td>Engineering Experimentation</td>
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<tr>
<td>ENGR 304</td>
<td>Mechanics of Fluids</td>
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<tr>
<td>ENGR 309</td>
<td>Mechanics of Solids</td>
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<tr>
<td>ENGR 434</td>
<td>Principles of Environmental Engineering</td>
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<tr>
<td>GE Area C: Arts (C1) or Humanities (C2)</td>
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<tr>
<td>GE Area D: U.S. History (D2) or U.S. and California Gov. (D3)</td>
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<tr>
<td><strong>Sixth Semester</strong></td>
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<tr>
<td>ENGR 302</td>
<td>Experimental Analysis</td>
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<tr>
<td>ENGR 323</td>
<td>Structural Analysis</td>
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<tr>
<td>ENGR 429</td>
<td>Construction Management</td>
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<tr>
<td>ENGR 430</td>
<td>Soil Mechanics</td>
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<tr>
<td>ENGR 436</td>
<td>Transportation Engineering</td>
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<tr>
<td>GE Area C: Humanities: Literature (C3)</td>
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<tr>
<td><strong>Seventh Semester</strong></td>
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<tr>
<td>ENGR 425</td>
<td>Reinforced Concrete Structures</td>
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<tr>
<td>ENGR 696</td>
<td>Engineering Design Project I</td>
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<tr>
<td>Major Upper Division Electives – Take Two</td>
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<tr>
<td>GE Area D: Social Sciences (D1)</td>
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<td><strong>Eighth Semester</strong></td>
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<tr>
<td>ENGR 697GW</td>
<td>Engineering Design Project II - GWAR</td>
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<tr>
<td>Major Upper Division Electives – Take Two</td>
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<tr>
<td>GE Area UD–C: Upper Division Arts and/or Humanities (Consider SF State Studies Course)</td>
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<tr>
<td>GE Area UD–D: Upper Division Social Sciences (Consider SF State Studies Course)</td>
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<tr>
<td><strong>Total Units</strong></td>
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<td>127-129</td>
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Depending on courses completed through Early Start and in high school, students in Pathway/Category 3 or 4 may be required to enroll in additional courses before they can take MATH 199 or MATH 226. Most students in Pathway/Category 3 or 4 will need to take a stretch format for MATH 199 (MATH 197 in Fall 2018 and MATH 198 in Spring 2019). Before enrolling in a B4 course, students should verify their MATH Pathway/Category in their Student Center (http://cms.sfsu.edu/content/student-center). Information regarding the courses that correspond with your MATH Pathway/Category can be found on the Developmental Studies Office Website (http://developmentalstudies.sfsu.edu).

ENG 114 can only be taken if you complete Directed Self-Placement (DSP) and select ENG 114; if you choose ENG 104/ENG 105 through DSP you will satisfy A2 upon successful completion of 105 in the second semester; multilingual students may be advised into alternative English courses.

To avoid taking additional units, it is recommended that you meet LLD and SF State Studies requirements (AERM, GP, ES, SJ) within your GE.

GE Area A: Critical Thinking (A3) is satisfied upon completion of ENGR 205 and ENGR 201 or ENGR 213.

GE Area UD–B: Upper Division Physical and/or Life Sciences is satisfied upon completion of ENGR 300 and either ENGR 301 or ENGR 302.

You must complete 21 units of upper-division engineering units before registering for ENGR 696.

Major Electives (12 units)
ENGR 303 Engineering Thermodynamics (3 units)
ENGR 426 Steel Structures (3 units)
ENGR 427 Wood Structures (3 units)
ENGR 431 Foundation Engineering (3 units)
ENGR 432 Finite Element Methods in Structural and Continuum Mechanics (3 units)
ENGR 435 Environmental Engineering Design (3 units)
ENGR 439 Construction Engineering (3 units)
ENGR 441 Fundamentals of Composite Materials (3 units)
ENGR 461 Mechanical and Structural Vibrations (3 units)
ENGR 468 Applied Fluid Mechanics and Hydraulics (3 units)
ENGR 469 Alternative and Renewable Energy Systems (3 units)
ENGR 610 Engineering Cost Analysis (3 units)
ENGR 699 Independent Study (1-3 units)
ENGR 826 Seismic Hazard Analysis (3 units)
ENGR 827 Structural Design for Fire Safety (3 units)
ENGR 829 Advanced Topics in Structural Engineering (3 units)
ENGR 831 Advanced Concrete Structures (3 units)
ENGR 832 Advanced Topics in Seismic Design (3 units)
ENGR 833 Principles of Earthquake Engineering (3 units)
ENGR 835 Advanced Steel Structures (3 units)
ENGR 836 Structural Design for Earthquakes (3 units)
ENGR 837 Geotechnical Earthquake Engineering (3 units)