# CIVIL ENGINEERING BS + CIVIL ENGINEERING MS SF SCHOLARS ROADMAP

This roadmap is a suggested plan of study and does not replace meeting with an advisor. Please note that students may need to adjust the actual sequence of courses based on course availability. Please consult an advisor in your major program for further guidance.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall Semester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select One (Major Core):</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>CHEM 115</td>
<td>General Chemistry I</td>
<td></td>
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<tr>
<td>CHEM 180</td>
<td>Chemistry for Energy and the Environment</td>
<td></td>
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<tr>
<td>(B1, B3, ES)</td>
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<tr>
<td>ENG 114</td>
<td>Writing the First Year: Finding Your Voice</td>
<td>3</td>
</tr>
<tr>
<td>(A2)</td>
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<tr>
<td>ENGR 100</td>
<td>Introduction to Engineering (Major Core)</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 101</td>
<td>Engineering Graphics (Major Core)</td>
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</tr>
<tr>
<td>MATH 226</td>
<td>Calculus I (Major Core, B4)</td>
<td>4</td>
</tr>
<tr>
<td>GE Area A: Oral Communication (A1)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
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<td>17-18</td>
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<tr>
<td><strong>Spring Semester</strong></td>
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<tr>
<td>ENGR 271</td>
<td>Introduction to MATLAB (Major Core)</td>
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<tr>
<td>MATH 227</td>
<td>Calculus II (Major Core)</td>
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<tr>
<td>PHYS 220</td>
<td>General Physics with Calculus I 4 &amp; PHYS 222</td>
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<tr>
<td>&amp; PHYS 222</td>
<td>General Physics with Calculus II and</td>
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<td></td>
<td>General Physics with Calculus II Laboratory (Major Core)</td>
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<tr>
<td>GE Area D - Take Two</td>
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<tr>
<td><strong>Units</strong></td>
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<td>15</td>
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<tr>
<td><strong>Second Year</strong></td>
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<tr>
<td><strong>Fall Semester</strong></td>
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<tr>
<td>ENGR 102</td>
<td>Statics (Major Core)</td>
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<tr>
<td>ENGR 200</td>
<td>Materials of Engineering (Major Core)</td>
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</tr>
<tr>
<td>MATH 228</td>
<td>Calculus III (Major Core)</td>
<td>4</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Spring Semester</strong></td>
<td></td>
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<tr>
<td>ENGR 300</td>
<td>Engineering Experimentation (Major Core)</td>
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<tr>
<td>ENGR 304</td>
<td>Mechanics of Fluids (Major Core)</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 309</td>
<td>Mechanics of Solids (Major Core)</td>
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<tr>
<td>ENGR 434</td>
<td>Principles of Environmental Engineering (Major Core)</td>
<td>3</td>
</tr>
<tr>
<td>GE Area C</td>
<td></td>
<td>3</td>
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<tr>
<td><strong>Units</strong></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Third Year</strong></td>
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<tr>
<td><strong>Fall Semester</strong></td>
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<tr>
<td>ENGR 302</td>
<td>Experimental Analysis (Major Core)</td>
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<td>ENGR 323</td>
<td>Structural Analysis (Major Core)</td>
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<tr>
<td>ENGR 429</td>
<td>Construction Management (Major Core)</td>
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<tr>
<td>ENGR 430</td>
<td>Soil Mechanics (Major Core)</td>
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<tr>
<td>ENGR 436</td>
<td>Transportation Engineering (Major Core)</td>
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<tr>
<td>GE Area B: Life Science (B2)</td>
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<td>3</td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td>16</td>
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</tbody>
</table>
### Fourth Year

#### Summer Semester

| GE Area C | 3 |
| GE Area F | 3 |

| Units | 6 |

#### Fall Semester

| ENGR 425 | Reinforced Concrete Structures (Major Core) | 3 |
| ENGR 696 | Engineering Design Project I (Major Core) | 1 |
| ENGR 833 | Principles of Earthquake Engineering (Graduate Core) | 3 |

| Major Upper-Division Electives (12 Units Total) - Take Two | 6 |
| Graduate Electives (15-18 Units) - Take One | 3 |

| Units | 16 |

#### Spring Semester

| ENGR 697GW | Engineering Design Project II - GWAR (Major Core) | 2 |
| ENGR 836 | Structural Design for Earthquakes (Graduate Core) | 3 |

| Major Upper-Division Electives (12 Units Total) - Take Two | 6 |
| GE Area UD-C: Upper-Division Arts and/or Humanities | 3 |
| GE Area UD-D: Upper-Division Social Sciences | 3 |

| Units | 17 |

### Fifth Year

#### Fall Semester

| ENGR 839 | Advanced Topics in Civil Engineering (Graduate Core) | 3 |

| Select One (Culminating Experience): | 3 |
| ENGR 897 | Research |
| Graduate Elective | 9 |
| Graduate Electives (15-18 Units) - Take Two | 6 |

| Units | 12 |

#### Spring Semester

| ENGR 895 | Applied Research Project | 3 |
| ENGR 898 | Master's Thesis | 9 |

| Graduate Electives (15-18 Units) - Take Two | 6 |

| Units | 9 |

| Total Units | 156-157 |

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1. 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 ENG 105 in the second semester; multilingual students may be advised into alternative English courses.

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3. To determine the best B4 course option, students should complete the online advising activity at mathadvising.sfsu.edu (https://mathadvising.sfsu.edu/). Questions? Contact Gator Smart Start. (https://gatorsmartstart.sfsu.edu/)

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

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

6. GE Area UD-B: Upper-Division Physical and/or Life Sciences is satisfied upon completion of ENGR 306 and either ENGR 303 or ENGR 302.

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

8. **Major Electives (12 units)**
   - ENGR 303 Engineering Thermodynamics (3 units) (Prerequisite for ENGR 469)
   - ENGR 426 Steel Structures (3 units)
   - ENGR 427 Wood Structures (3 units)
   - ENGR 431 Foundation Engineering (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 Structural Dynamics (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)

9. **Engineering Electives (15-18 units)**
   - Students may use up to 3 units of non-engineering courses as an elective with the approval of the graduate coordinator. Such courses can be graduate or upper-division selected primarily from science, mathematics, social science, or business.
   - Units selected on advisement from:
     - ENGR 425 Reinforced Concrete Structures (3 units)
     - ENGR 426 Steel Structures (3 units)
     - ENGR 427 Wood Structures (3 units)
     - ENGR 431 Foundation Engineering (3 units)
     - ENGR 461 Structural Dynamics (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)

To avoid taking additional units, it is recommended that you meet U.S. and California Government (USG/CSLG) within Upper-Division GE.
± Given catalog rights, fall 2023 transfer students do not need to complete an Area F course.