

# BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING ROADMAP – QUANTITATIVE REASONING CATEGORY III/IV

129 Total Units Required

Minimum Number of Units in Major: 93

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 your Degree Planner (<https://registrar.sfsu.edu/degreeplanner/>) and an advisor for further guidance.

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

Course	Title	Units
<b>First Semester</b>		
ENGR 100	Introduction to Engineering (Major Core)	3
ENGR 212	Introduction to Unix and Linux for Engineers (Major Core)	2
MATH 197	Prelude to Calculus I (Prerequisite for MATH 226) <sup>1</sup>	3
GE Area 1A: English Composition <sup>2</sup>		3
GE Area 3: Arts and Humanities		3
<b>Units</b>		<b>14</b>
<b>Second Semester</b>		
Select One (Major Core):		3-4
CHEM 115	General Chemistry I	
CHEM 180	Chemistry for Energy and the Environment	
MATH 198	Prelude to Calculus II (Prerequisite for MATH 226, GE 2) <sup>1</sup>	3
GE Area 1C: Oral Communication		3
GE Area 3: Arts and Humanities		3
<b>Units</b>		<b>12-13</b>
<b>Third Semester</b>		
MATH 226	Calculus I (Major Core, GE 2) <sup>1</sup>	4
GE Area 4: Social and Behavioral Sciences - Take Two <sup>3</sup>		6
GE Area 5B: Biological Science		3
<b>Units</b>		<b>13</b>
<b>Fourth Semester</b>		
MATH 227	Calculus II (Major Core)	4

PHYS 220 & PHYS 222	General Physics with Calculus I and General Physics with Calculus I Laboratory (Major Core, GE 5A, GE 5B)	4
ENGR 213	Introduction to C Programming for Engineers (Major Core) <sup>4</sup>	3
ENGR 214	C Programming Laboratory <sup>Major Core</sup>	1
<b>Units</b>		<b>12</b>

<b>Fifth Semester</b>		
ENGR 221	Data Structures and Algorithms in Python (Major Core)	4
ENGR 281	Probability and Statistics for Engineers (Major Core)	2
MATH 228	Calculus III (Major Core)	4
PHYS 230 & PHYS 232	General Physics with Calculus II and General Physics with Calculus II Laboratory (Major Core)	4
<b>Units</b>		<b>14</b>

<b>Sixth Semester</b>		
ENGR 205	Electric Circuits (Major Core) <sup>4</sup>	3
ENGR 206	Circuits and Instrumentation Laboratory (Major Core)	1
MATH 245	Elementary Differential Equations and Linear Algebra (Major Core)	3
PHYS 240 & PHYS 242	General Physics with Calculus III and General Physics with Calculus III Laboratory (Major Core)	4
GE Area 6: Ethnic Studies ( <a href="https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/">https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/</a> )		3
<b>Units</b>		<b>14</b>

<b>Seventh Semester</b>		
ENGR 305	Linear Systems Analysis (Major Core)	3
ENGR 306	Electromechanical Systems (Major Core)	3
ENGR 353	Microelectronics (Major Core)	3

ENGR 356	Digital Design (Major Core)	3
ENGR 357	Digital Design Laboratory (Major Core)	1
<b>Units</b>		<b>13</b>
<b>Eighth Semester</b>		
ENGR 301	Microelectronics Laboratory (Major Core)	1
ENGR 442	Operational Amplifier Systems Design (Major Core)	3
ENGR 446	Control Systems Laboratory (Major Core)	1
ENGR 447	Control Systems (Major Core)	3
ENGR 478	Design with Microprocessors (Major Core) <sup>5</sup>	4
<b>Units</b>		<b>12</b>
<b>Ninth Semester</b>		
ENGR 350	Introduction to Engineering Electromagnetics (Major Core)	3
ENGR 449	Communication Systems (Major Core)	3
ENGR 451	Digital Signal Processing (Major Core)	4
ENGR 696	Engineering Design Project I (Major Core)	1
GE Area 3UD: Upper-Division Arts or Humanities <sup>6</sup>		3
<b>Units</b>		<b>14</b>
<b>Tenth Semester</b>		
ENGR 697GW	Engineering Design Project II - GVAR (Major Core)	2
Major Upper-Division Electives - Take Two <sup>7</sup>		6
GE Area 4UD: Upper-Division Social and Behavioral Sciences <sup>6</sup>		3
<b>Units</b>		<b>11</b>
<b>Total Units</b>		<b>129-130</b>

gatorsmartstart.sfsu.edu/howtofindyourpathways/). Questions?

Contact Gator Smart Start. (<https://gatorsmartstart.sfsu.edu/>)

<sup>3</sup> First-time freshmen must take one lower-division Area 4 course that meets US History (USH).

<sup>4</sup> GE Area 1B: Critical Thinking is satisfied upon completion of ENGR 205 and ENGR 201 or ENGR 213.

<sup>5</sup> GE area 5UD (Upper-Division Science) is satisfied upon completion of ENGR 478.

<sup>6</sup> To avoid taking additional units, it is recommended that you meet **U.S. and California Government** (USG/CSLG) within Upper-Division GE.

<sup>7</sup> **Major Upper-Division Electives (6 units)**

A full list of courses that can fulfill this requirement can be found in the Degree Requirements (<https://bulletin.sfsu.edu/colleges/science-engineering/engineering/bs-electrical-engineering/#degreerequirementstext>).

<sup>1</sup> Students should use their Pathway/Category (<https://gatorsmartstart.sfsu.edu/pathways/>) to determine the appropriate GE 2 course option. For directions on how to view your Pathway/Category, visit how to find your pathway (<https://gatorsmartstart.sfsu.edu/howtofindyourpathways/>). Questions? Contact Gator Smart Start. (<https://gatorsmartstart.sfsu.edu/>)

<sup>2</sup> Students should use their Pathway/Category (<https://gatorsmartstart.sfsu.edu/pathways/>) to determine the appropriate GE 1A course option. For directions on how to view your Pathway/Category, visit how to find your pathway (<https://gatorsmartstart.sfsu.edu/howtofindyourpathways/>).