

COMPUTER ENGINEERING BS + ELECTRICAL AND COMPUTER ENGINEERING MS SF STATE SCHOLARS ROADMAP

The San Francisco State Scholars program provides undergraduate students with an accelerated pathway to a graduate degree. Students in this program pursue a bachelor's and master's degree simultaneously. This program allows students to earn graduate credit while in their junior and/or senior year, reducing the number of semesters required for completion of a master's degree.

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, ESCA, SJ) requirements within your GE or major.

Course	Title	Units
First Year		
Fall Semester		
Select One (Major Core):		3-4
CHEM 115	General Chemistry I	
CHEM 180	Chemistry for Energy and the Environment (ESCA)	
ENGR 100	Introduction to Engineering (Major Core)	3
ENGR 212	Introduction to Unix and Linux for Engineers (Major Core)	2
MATH 226	Calculus I (Major Core, GE 2) ¹	4
GE Area 1A: English Composition ²		3
		Units 15-16
Spring Semester		
ENGR 213	Introduction to C Programming for Engineers (Major Core) ³	3
ENGR 214	C Programming Laboratory (Major Core)	1
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 5C)	4
GE Area 1C: Oral Communication		3
		Units 15
Second Year		
Fall Semester		
CSC 230	Discrete Mathematical Structures for Computer Science (Major Core)	3
ENGR 221	Data Structures and Algorithms in Python (Major Core)	4
PHYS 230 & PHYS 232	General Physics with Calculus II and General Physics with Calculus II Laboratory (Major Core)	4
GE Area 5B: Biological Science		3
		Units 14
Spring Semester		
ENGR 205	Electric Circuits (Major Core) ³	3
ENGR 206	Circuits and Instrumentation Laboratory (Major Core)	1
ENGR 282	Probability and Statistics for Engineers (Major Core)	3
MATH 245	Elementary Differential Equations and Linear Algebra (Major Core)	3
GE Area 3: Arts and Humanities		3
GE Area 4: Social and Behavioral Sciences ⁴		3
		Units 16
Third Year		
Summer Semester		
GE Area 3: Arts and Humanities		3
GE Area 4: Social and Behavioral Sciences ⁴		3
		Units 6
Fall Semester		
ENGR 305	Linear Systems Analysis (Major Core)	3
ENGR 340	Programming Methodology for Engineers (Major Core)	4

ENGR 356	Digital Design (Major Core)	3
ENGR 357	Digital Design Laboratory (Major Core)	1
ENGR 413	Artificial Intelligence (AI) in Engineering (Major Core)	3
GE Area 6: Ethnic Studies (https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/)		3

Units 17

Spring Semester

Select One (Major Core):		4
ENGR 353 & ENGR 301	Microelectronics and Microelectronics Laboratory	
ENGR 354	Electronics for Computer Engineers	
ENGR 378	Digital Systems Design (Major Core)	3
ENGR 451	Digital Signal Processing (Major Core)	4
ENGR 478	Design with Microprocessors (Major Core) ⁵	4

Units 15

Fourth Year

Summer Semester

GE Area 3UD: Upper-Division Arts or Humanities ⁶		3
GE Area 4UD: Upper-Division Social and Behavioral Sciences ⁶		3

Units 6

Fall Semester

ENGR 456	Computer Systems (Major Core)	3
ENGR 476	Computer Communications Networks (Major Core)	3
ENGR 498	Advanced Design with Microcontrollers (Major Core)	4
ENGR 696	Engineering Design Project I (Major Core)	1
ENGR 844	Embedded Systems (Graduate Core)	3
Graduate Elective ⁷		3

Units 17

Spring Semester

ENGR 697GW	Engineering Design Project II - GEAR (Major Core)	2
ENGR 852	Advanced Digital (Graduate Core)	3

Major Upper-Division Electives - Take Two ⁸	6
Graduate Elective ⁷	3
Units	14

Fifth Year

Fall Semester

Select One:		3
ENGR 897	Research (if selecting Culminating Experience Option A)	
Graduate Elective (if selecting Culminating Experience Option B) ⁷		6

Graduate Elective - Take Two ⁷	6
Units	9

Spring Semester

Select One (Culminating Experience)		3
ENGR 895	Applied Research Project (if selecting Culminating Experience Option B)	
ENGR 898	Master's Thesis (if selecting Culminating Experience Option A)	

Graduate Elective - Take Two ⁷	6
Units	9

Total Units 153-154

¹ 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/>)

² 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>). Questions? Contact Gator Smart Start. (<https://gatorsmartstart.sfsu.edu/>)

³ GE Area 1B: Critical Thinking is satisfied upon completion of ENGR 205 or ENGR 282 and either ENGR 201 or ENGR 213.

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

⁵ GE Area 5UD (Upper-Division Science) is satisfied upon completion of ENGR 478.

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

⁷ **Graduate Engineering Electives (18-21 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/ms-electrical-computer-engineering/#degreerequirementstext>).

⁸ **Upper-Division Electives (6 units minimum)**

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-computer-engineering/#degreerequirementstext>).

* The total number of units required will depend on the Culminating Experience option selected.