BACHELOR OF SCIENCE IN COMPUTER ENGINEERING 5 YEAR ROADMAP – QUANTITATIVE REASONING CATEGORY I/II

123 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
First Semester		
Select One (Major Core):		3-4
CHEM 115	General Chemistry I	
CHEM 180	Chemistry for Energy and the Environment	
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**
Second Semester		
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
ENGR 213	Introduction to C Programming for Engineers (Major Core) [3]	3
ENGR 214	C Programming Laboratory (Major Core)	1
GE Area 1C: Oral Communication		3
	Units	**15**
Third Semester		
ENGR 221	Data Structures and Algorithms in Python (Major Core)	4
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
GE Area 5B: Biological Science		3
	Units	**15**
Fourth Semester		
ENGR 205	Electric Circuits (Major Core) [3]	3
ENGR 206	Circuits and Instrumentation Laboratory (Major Core)	1
ENGR 281	Probability and Statistics for Engineers (Major Core)	2
MATH 245	Elementary Differential Equations and Linear Algebra (Major Core)	3
GE Area 3: Arts and Humanities		3
	Units	**12**
Fifth Semester		
ENGR 305	Linear Systems Analysis (Major Core)	3
ENGR 340	Programming Methodology for Engineers (Major Core)	4
ENGR 354	Electronics for Computer Engineers (Major Core)	4
ENGR 478	Design with Microprocessors (Major Core) [4]	4
	Units	**15**
Sixth Semester		
ENGR 356	Digital Design (Major Core)	3
ENGR 357	Digital Design Laboratory (Major Core)	1
ENGR 498	Advanced Design with Microcontrollers (Major Core)	4
GE Area 3: Arts and Humanities		3
GE Area 4: Social and Behavioral Sciences [5]		3
	Units	**14**

Seventh Semester

ENGR 378	Digital Systems Design (Major Core)	3
ENGR 456	Computer Systems (Major Core)	3
ENGR 476	Computer Communications Networks (Major Core)	3
GE Area 4: Social and Behavioral Sciences [5]		3
	Units	**12**

Eighth Semester

ENGR 451	Digital Signal Processing	4
ENGR 696	Engineering Design Project I (Major Core)	1
Major Upper-Division Electives [6]		3
GE Area 6: Ethnic Studies (https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/)		3
GE Area 4UD: Upper-Division Social and Behavioral Sciences [7]		3
	Units	**14**

Ninth Semester

ENGR 413	Artificial Intelligence in Engineering (Major Core)	3
ENGR 697GW	Engineering Design Project II - GWAR (Major Core)	2
Major Upper-Division Electives [5]		3
GE Area 3UD: Upper-Division Arts or Humanities [7]		3
	Units	**11**
	Total Units	**123-124**

[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 and ENGR 201 or ENGR 213.

[4] GE area 5UD (Upper-Division Science) is satisfied upon completion of ENGR 478.

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

[6] **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-computer-engineering/#degreerequirementstext).

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