

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

131 Total Units Required

Minimum Number of Units in Major: 95

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		
ENGR 100	Introduction to Engineering (Major Core)	3
ENGR 101	Engineering Graphics (Major Core)	1
MATH 197	Prelude to Calculus I (Prerequisite for MATH 226) ¹	3
GE Area 1A: English Composition ²		3
GE Area 1C: Oral Communication		3
Units		13
Second Semester		
Select One (Major Core):		3-4
CHEM 115	General Chemistry I	
CHEM 180	Chemistry for Energy and the Environment (ES)	
MATH 198	Prelude to Calculus II (Prerequisite for MATH 226, GE 2) ¹	3
GE Area 3: Arts and Humanities		3
GE Area 4: Social and Behavioral Sciences ³		3
Units		12-13
Third Semester		
MATH 226	Calculus I (Major Core, GE 2) ¹	4
ENGR 200	Materials of Engineering (Major Core)	3
GE Area 3: Arts and Humanities		3
GE Area 5B: Biological Science		3
Units		13
Fourth Semester		
ENGR 103	Introduction to Computers (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
Modular Elective - Take Three ⁴		3
Units		12
Fifth Semester		
ENGR 102	Statics (Major Core)	3
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 4: Social and Behavioral Sciences ³		3
Units		14
Sixth Semester		
ENGR 201	Dynamics (Major Core) ⁵	3
ENGR 205 & ENGR 206	Electric Circuits and Circuits and Instrumentation Laboratory (Major Core) ⁵	4
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
Units		14
Seventh Semester		
ENGR 300	Engineering Experimentation (Major Core) ⁵	3
ENGR 303	Engineering Thermodynamics (Major Core)	3
ENGR 307	Systems Dynamics and Mechanical Vibrations (Major Core)	3
ENGR 309	Mechanics of Solids (Major Core)	3
Units		12

Eighth Semester

ENGR 302	Experimental Analysis (Major Core) ⁵	1
ENGR 304	Mechanics of Fluids (Major Core)	3
ENGR 364	Materials and Manufacturing Processes (Major Core)	3
Major Upper-Division Elective ⁶		3
GE Area 6: Ethnic Studies (https://bulletin.sfsu.edu/undergraduate-education/general-education/areasix/)		3

Units 13

Ninth Semester

Select One Set of Courses (Major Controls Elective):		4
ENGR 410 & ENGR 411	Process Instrumentation and Control and Instrumentation and Process Control Laboratory	
ENGR 447 & ENGR 446	Control Systems and Control Systems Laboratory	
ENGR 464	Mechanical Design (Major Core)	3
ENGR 467	Heat Transfer (Major Core)	3
ENGR 696	Engineering Design Project I (Major Core)	1
GE Area 3UD: Upper-Division Arts or Humanities ⁷		3

Units 14

Tenth Semester

ENGR 463	Thermal Power Systems (Major Core)	3
ENGR 697GW	Engineering Design Project II - GVAR (Major Core)	2
Major Upper-Division Electives – Take Two ⁶		6
GE Area 4UD: Upper-Division Social and Behavioral Sciences ⁷		3

Units 14

Total Units 131-132

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

⁴ **Lower-Division Modular Electives (3 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-mechanical-engineering/#degreerequirementstext>).

⁵ **Met in Major**

- Area 1B (Critical Thinking) is satisfied upon completion of ENGR 205 and either ENGR 201 or ENGR 213.
- Area 5UD (Upper-Division Sciences) is satisfied upon completion of ENGR 300 and either ENGR 301 or ENGR 302.

⁶ **Upper-Division Major Electives (9 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-mechanical-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.

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/>)