



## PROGRAM DESCRIPTION

Materials engineers seek to optimize the performance of a product by manipulating the atoms and molecules that make up materials in order to control their properties. They contribute their expertise in every field of technology, including nano-sized cancer treatments, sustainable packaging and large-scale composites found in aerospace applications.

Cal Poly's Materials Engineering is a small, family-like department that emphasizes hands-on learning with materials testing and analysis equipment. We strive for excellence in teaching that helps each member of our community achieve their future aspirations — whatever those may be.

## OUR MISSION

Our mission is to be a vibrant, creative and effectual learning community that cultivates the unique capabilities of each individual to thrive in a complex, interconnected, technical and ever-changing world.



# MATE

**207**  
undergraduate  
students

enrolled in  
materials  
engineering

**22**  
graduate  
students

enrolled in the  
blended B.S and M.S.  
programs

## LABS

Cal Poly materials engineering labs use state-of-the-art instruments and testing equipment found in industry. Equipment includes an environmental scanning electron microscope, X-ray diffractometer, hardness testers, heat treatment labs and more.

## ASSOCIATED CLUBS

- **Alpha Sigma Mu Honor Society** — [alphasigmamu.org](http://alphasigmamu.org)
- **Engineers Without Borders** — [ewb.calpoly.edu](http://ewb.calpoly.edu)
- **Materials Engineering Student Society** — [calpolymess.weebly.com](http://calpolymess.weebly.com)
- **Micro Systems Technology Group** — [mstcalpoly.wordpress.com](http://mstcalpoly.wordpress.com)
- **National Association of Corrosion Engineers** — [slccorrosion.weebly.com](http://slccorrosion.weebly.com)
- **QL+ (Quality of Life Plus)** — [qlplus.calpoly.edu](http://qlplus.calpoly.edu)
- **Power Engineering Society** — [web.calpoly.edu/~pesclub](http://web.calpoly.edu/~pesclub)
- **Renewable Energy Club** — [web.calpoly.edu/~recclub](http://web.calpoly.edu/~recclub)
- **Society of Women Engineers** — [swe.calpoly.edu](http://swe.calpoly.edu)
- **Women Involved in Software & Hardware (WISH)** — [calpoly.edu/~wish](http://calpoly.edu/~wish)

## MATERIALS ENGINEERING GRADUATES

The majority of Cal Poly Materials Engineering graduates find employment in the biomedical, electronic, aerospace and petroleum industries as executives, consultants, or in research and development. Other graduates are entrepreneurs who have started their own consulting or manufacturing companies.



# B.S. IN MATERIALS ENGINEERING

## Suggested Four-year Academic Flowchart • 2022-2026 Catalog

Updated 7/6/2022

FRESHMAN			SOPHOMORE			JUNIOR			SENIOR		
Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter	Spring
Introduction to Materials Engineering Design I <b>MATE 110 (1)</b>	Introduction to Materials Engineering Design II <b>MATE 120 (1)</b> (MATE 110)	Materials Engineering <b>MATE 210 (3)</b> (CHEM 111, 124, or 127; Recom: MATE 215 concur.)	Materials, Ethics, and Society <b>MATE 232 (4)</b> (MATE 210)	Materials Laboratory III <b>MATE 235 (1)</b> (MATE 225)	Materials Engineering Analysis <b>MATE 245 (1)</b> (MATE 210 & 235)	Electronic Materials Systems <b>MATE 340 (4)</b> (MATE 210; PHYS 143)	Noncrystalline Material Systems <b>MATE 310 (4)</b> (MATE 210 & 340)	Materials Selection Life Cycle <b>MATE 300 (4)</b> (Jr Standing; MATE 210) [GWR]	Senior Project I <b>MATE 482 (1)<sup>5</sup></b> (Sr Standing)	Senior Project II <b>MATE 483 (2)<sup>5</sup></b> (MATE 482)	Senior Project III <b>MATE 484 (2)<sup>5</sup></b> (MATE 483)
Introduction to Design & Manufacturing <b>IME 144 (4)</b>			Materials Laboratory I <b>MATE 215 (1)</b> (Prereq or concur: MATE 210)	Materials Laboratory II <b>MATE 225 (1)</b> (MATE 215; Concur: MATE 232)	Introduction to Materials Thermodynamics <b>MATE 280 (4)</b> (CHEM 125, PHYS 143, MATH 143, MATE 210 & 215)	Metallurgical Materials Systems <b>MATE 360 (4)</b> (MATE 235)	Kinetics of Materials & Process Design <b>MATE 370 (4)</b> (MATE 280 or 380)	Structural Materials Systems <b>MATE 350 (4)</b> (MATE 210; Coreq: CE 204)	Composite Materials Systems <b>MATE 480 (4)</b> (MATE 350)	Technical Elective <b>(4)<sup>1,2,3</sup></b>	Technical Elective <b>(4)<sup>1,2,3</sup></b>
Calculus I <b>MATH 141 (4)<sup>4</sup></b> * [B4]	Calculus II <b>MATH 142 (4)<sup>4</sup></b> (MATH 141 w/min C-) [B4]	Calculus III <b>MATH 143 (4)<sup>4</sup></b> (MATH 142 w/min C-) [Area B Elective]	Calculus IV <b>MATH 241 (4)</b> (MATH 143)	Linear Analysis I <b>MATH 244 (4)</b> (MATH 143)	Electric Circuit Theory & Lab <b>EE 201 (3) &amp; EE 251 (1)</b> (MATH 244; PHYS 143)	Transport Phenomena I <b>MATE 325 (1)</b> (PHYS 142; MATH 141)	Mechanics of Materials I <b>CE 204 (3)</b> (ME 211)	Approved Elective / Junior Year Elective <b>(4-5)<sup>6</sup></b>	Technical Elective <b>(4)<sup>1,2,3</sup></b>	Approved Elective/ Technical Breadth Elective <b>(4)<sup>1,2,3</sup></b>	Approved Elective/ Technical Breadth Elective <b>(4)<sup>1,2,3</sup></b>
General Chem for Physical Science & Engineering I <b>CHEM 124 (4)<sup>4</sup></b> * [B1 & B3]	General Chem for Physical Science & Engineering II <b>CHEM 125 (4)</b> (CHEM 124)	General Physics I <b>PHYS 141 (4)<sup>4</sup></b> * [Area B Elective]	General Physics III <b>PHYS 143 (4)</b> (PHYS 141; MATH 142; Recom: MATH 241)	General Physics II <b>PHYS 142 (4)</b> (PHYS 141; MATH 142 or 182)	Choose One Series <sup>4</sup> : [Upper-Div B] <b>STAT 312 (4) &amp; IME 315 (3)</b> * (MATH 142) OR <b>STAT 321 (4) &amp; IME 315 (3)</b> * (MATH 142) OR <b>STAT 321 (4) &amp; IME 326 (4)</b> * (STAT 321 w/ min C-)						
	GE (4) **			Engineering Statics <b>ME 211 (3)</b> (PHYS 131/141; Prereq or concur: MATH 241)				GE (4) **			
Oral Communication <b>COMS 101 or 102 (4)**</b> [A1] Can be taken anytime during Freshman Year					GE (4) **	GE (4) **	GE (4) **	GE (4) **	GE (4) **	GE (4) **	GE (4) **
Expository Writing <b>ENGL 133 or 134 (4)**</b> [A2] Can be taken anytime during Freshman Year											
	Reasoning, Argumentation, & Writing [A3] <b>COMS 126, COMS/ENGL 145, ENGL 148, or PHIL 126 (4)**</b> (Completion of GE A2 with a C- or better) Can be taken anytime between Winter of Freshman and Winter of Sophomore Years.							Graduation Writing Requirement <b>GWR*</b> (Students can attempt to fulfill the requirement after 90 earned units; students should complete the requirement before senior year)			
17	17	16	13	16	17	16-17	15	16-17	13	14	14
										<b>TOTAL:</b>	<b>184-186</b>

**Notes:**

**MOST GENERAL EDUCATION COURSES CAN BE TAKEN IN ANY ORDER AS LONG AS PREREQUISITES ARE MET.**

**Transfer students - see department for flowchart information intended specifically for transfer students.**

\* Refer to current catalog for prerequisites.

\*\* One course from each of the following GE areas must be completed: A1, A2, A3, B2, C1, C2, Lower-Division C Elective, Upper-Division C, D1, Area D Elective, Lower-Division E, and F. Upper-Division C should be taken only after junior standing is reached (90 units).

Refer to online catalog for GE course selection, United States Cultural Pluralism (USCP) and Graduation Writing Requirement (GWR).

USCP requirement can be satisfied by some (but not all) courses within GE categories: C1, Upper-Division C, D1, D2, Upper-Division D, or E.

<sup>1</sup> If a course is taken to meet this requirement, it cannot be double-counted to satisfy another Major or Support requirement.

<sup>2</sup> Consultation with an advisor is recommended prior to selecting Technical or Approved Electives; bear in mind your selections may impact pursuit of post-baccalaureate studies and/or

<sup>3</sup> 8 units maximum of MATE 400 and/or MATE 500 may count towards Technical Electives or Approved Electives/Technical Breadth Electives.

<sup>4</sup> Required in Major or Support; also satisfies General Education (GE) requirement.

<sup>5</sup> ENGR 459, ENGR 460, and ENGR 461 (6) may substitute for MATE 482, MATE 483, and MATE 484 (5) with the one excess unit counting towards Technical Electives.

<sup>6</sup> Select 4 to 5 units from the following: CHEM 312; ENGR 334; IME 303; ITP 341; MATE 390; NR 434.

**Legend:**

Course Title	
Course # (Units)	Major (71)
(Prerequisite)	Support (65-67)
[GE Area]	General Ed. (48)