Required Courses for the Chemical Engineering Degree, 2022-2023

This program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org

Undergraduate Advising: ech-advising@ucdavis.edu To make an advising appointment: appointments.ucdavis.edu

Note: Curriculum and courses offerings are subject to change. You must fulfil the degree requirements stated in the catalog of the year you graduate or the year immediately prior. For additional detail on courses and requirements, please visit the course supplement located at https://catalog.ucdavis.edu/departments-programs-degrees/chemical-engineering/

Writing Requirements

Lower Division Composition (4 units)		
Select ONE of the following courses:		
	UWP 1, 1V, or 1Y	Expository Writing
	ENL 3	Introduction to Literature
	COM 1	Bks of West Civ/Ancient World
	COM 2	Bks of West Civ/MidAge-English
	COM 3	Bks of West Civ/Modern Crisis
	COM 4	Bks of Contemporary World
	NAS 5	Intro to Native American Lit.

Courses must be completed with a C- or better. A 4 or 5 on your AP English exam will also satisfy this requirement.

Upper Division Composition (0 to 4 units)		
Select ONE of the following courses:		
	UWP 102E or 102F	Writing in Disciplines
	UWP 104A, 104E, or 104T	Writing in Professions

Courses must be completed with a C- or better. This requirement can also be satisfied by passing the Upper Division Composition Exam

General Education Requirement

This requirement is partially satisfied with coursework completed for the Chemical Engineering degree.
A detailed GE checklist can be found here.

Lower Division Major Requirements

Math, Physics, Chemistry, and Biology (56-59 units)

	Course	Description	Units	Quarter			Prerequisites
	MAT 21A	Calculus	4	F	W	S	
	MAT 21B	Calculus	4	F	W	S	C- or better in MAT 21A or MAT 21AH
	MAT 21C	Calculus	4	F	W	S	C- or better in MAT 21B or MAT 21BH
	MAT 21D	Vector Analysis	4	F	W	S	C- or better in MAT 21C or MAT 21CH
	MAT 22A or MAT 27A	Linear Algebra	3 4	F	W	S	C- or better in MAT 21C or MAT 21CH, ENG 6, EME 5, ECH 60, or MAT 22AL ☺
	MAT 22B or MAT 27B	Differential Equations	3 4	F	W	S	C- or better in MAT 22A or MAT 67
	PHY 9A	Classical Physics	5	F		S	MAT 21B or 🕮
	PHY 9B	Classical Physics	5	F	W		PHY 9A; MAT 21C; MAT 21D ☺
	PHY 9C	Classical Physics	5		W	S	PHY 9B; MAT 212D; MAT 22A ☺
	CHE 2A or CHE 4A	General Chemistry Gen Che for Phys Sci & Eng	5	F	W		24+ on Chemistry Placement Exam; 28+ on Chemistry Placement Exam
	CHE 2B or CHE 4B	General Chemistry Gen Che for Phys Sci & Eng	5		W	S	C- or better in CHE 2A or CHE 2AH or CHE 4A
	CHE 2C or CHE 4C	General Chemistry Gen Che for Phys Sci & Eng	5	F		S	C- or better in CHE 2B or CHE 2BH or CHE 4B
	BIS 2A or BIT 1Y	Introductory Biology Intro to Biotechnology	5 4	F	W	S S	None None

Engineering (16 units)

Course		Descriptions	Units	Quarter			Prerequisites
	ECH 5	BioChem/Materials Analysis	3		W		MAT 21A, MAT 21B ☺
	ECH 51	Materials Balances	4	F			C- or better in MAT 21C; MAT 21D ☺
	ECH 60	Computational Methods	4			S	MAT 21C
	ECH 80	Chemical Engineering Professionals *(SS GEE credit)*	1	F			None

Choose ONE of the following

	ENG 17	Circuits I	4	F	W	S	MAT 21C (C- or better recommended)
	ENG 35	Statics	4	F	W	S	C- or better in PHY 9A or PHY 9AH; C- or better in MAT 21D ☺
	ENG 45	Properties of Materials	4	F	W	S SS	C- or better in all of the following: MAT 21C, CHE 2A, PHY 9A; ENG 45Y is an online course only offered in Summer Session

Upper Division Major Requirements

Chemistry (16 units)

Course		Descriptions	Units	Quarter			Prerequisites
	CHE 128A	Organic Chemistry	3	F	W	S	C or better in CHE 2C or CHE 2CH
	CHE 129A	Organic Chemistry	2	F	W		C or better in CHE 2C; CHE 128A☺
	CHE 128B	Organic Chemistry	3		W	S	CHE 128A or 🕮
	CHE 110A	Quantum Mechanics	4	F		S	PHY 9C or PHY 9HC; CHE 2C or CHE 2CH; Complete of MAT 21D, MAT 22A, MAT 22Al, and PHY 9C or PHY 9HC strongly recommended
	CHE 110B	Atoms and Molecules	4	F	W		CHE 110A

Engineering core courses (56 units)

Course		Descriptions	Units	Quarter			Prerequisites
	ECH 140	Mathematical Methods	4	F			MAT 22B; ECH 60, ENG 6, or equivalent
	ECH 141	Fluid Mechanics	4	F			C- or better in ECH 51 ☺; ECH 140 ☺
	ECH 142	Heat Transfer	4		W		ECH 141
	ECH 143	Mass Transfer	4			S	ECH 141
	ECH 145A	Chemical Engineering Thermodynamics Lab	3		W		ECH 152A ☺
	ECH 145B	Chemical Engineering Transport Lab	3			S	ECH 141, ECH 145A
	ECH 148A	Chemical Kinetics and Reaction Engineering	3	F			ECH 143, ECH 152B
	ECH 148B	Chemical Kinetics and Reaction Engineering	4		W		ECH 148A
	ECH 152A	Thermodynamics	3		W		ECH 60, ENG 6, or equivalent. No credit given for students who have completed ENG 105
	ECH 152B	Thermodynamic	4			S	ECH 152A
	ECH 155	Chemical Engineering Kinetics and Reactor Design Lab	4		W		ECH 145B, ECH 148A, ECH 148B ☺, ECH 157 ☺; satisfaction of the upper division English composition requirement ☺
	ECH 157	Process Dynamics	4	F			ECH 140
	ECH 158A	Process Economics and Green Design *(SS GE3 credit)*	4	F			ECH 142, ECH 143
	ECH 158B	Separations and Unit Operations	4		W		ECH 158A
	ECH 158C	Plan Design Project *(SS GE3 credit)*	4			S	ECH 158B or ECH 161C

Chemical Engineering Electives continue on next page…

☺ *May be taken concurrently*
🕮 *May be taken with consent of instructor*
* *Not offered regularly*
** *Offered in alternate years*

Chemical Engineering Electives (8 units)

	At least **3** units must be completed in any upper division engineering course(s) (BIM-Biomedical Engineering, EAE-Aerospace Science & Engineering, EBS-Biological Systems Engineering, ECH- Chemical Engineering, ECI- Civil & Environmental Engineering, ECS- Computer Science Engineering, EEC- Electrical & Computer Engineering, EME- Mechanical Engineering, EMS- Materials Science & Engineering, ENG-Engineering) not numbered 190C, 192, 198, and 199 (independent study, research, seminar, or internship).
	Remainder of units, for a total of a minimum of **8** units, may be completed in any upper division engineering and/or science course(s)* including courses number 192 (internship) and 199 (independent study) but not numbered 190 or 198 with the exception of ECH 198. You may receive chemical engineering elective credit up to a maximum of 4 units for an internship (192) and/or independent study (199). *Acceptable science courses must carry one of the following subject designations: ATM-Atmospheric Science, BIS-Biological Sciences, BIT-Biotechnology, CHE-Chemistry, FPS-Fiber & Polymer Science, FST-Food Science & Technology, MAT-Mathematics, MCB-Molecular & Cellular Biology, PHY-Physics, STA-Statistics, VEN-Viticulture & Enology.

List your course for Chemical Engineering Electives below

	Course (Ex: CHE 168)	# of Units
		Units

College of Engineering Course Tips

- BIM-Biomedical Engineering – Most require BIS 2A or BIS 2B
- EAE-Aerospace Science & Engineering – Most courses require upper-division ENG courses
- EBS-Biological Systems Engineering – Most require EBS 75 and upper-division ENG courses
- ECH-Chemical Engineering – Most non-required ECH courses will have their pre-reqs already satisfied
- ECI-Civil & Environmental Engineering – Most upper-division courses require ENG 35
- ECS-Computer Science Engineering – Most require a programming course/series &/or ENG 17
- EEC-Electrical & Computer Engineering – Most upper-division courses require ENG 17
- EME-Mechanical Engineering – Most upper-division courses require upper-division ENG courses.
- EMS-Materials Science & Engineering – most upper-division courses require ENG 45
- ENG-Engineering– Most upper-division courses require ENG 35