

**California State University, Bakersfield
REQUIREMENTS FOR THE MAJOR: ENGINEERING**

2022-2023 Catalog

Name	ID#
Phone	Email

CORE REQUIREMENTS:					
INTRODUCTORY COURSES (LD ENGR - 23 UNITS)					
		Units	Institution	Date	Grade
ENGR 1618	Introduction to Engineering I	2			
ENGR 1628	Introduction to Engineering II	2			
ENGR 2070	Electric Circuits	4			
ENGR 2110	Analytic Mechanics – Statics	3			
ENGR 2120	Analytic Mechanics – Dynamics	3			
ENGR 2130	Mechanics of Materials	3			
ENGR 2140	Materials Science & Engineering	4			
ENGR 2350	Engineering Graphics	2			

CORE REQUIREMENTS:					
INTERMEDIATE COURSES (UD ENGR - 26 UNITS)					
		Units	Institution	Date	Grade
ENGR 3300	Engineering Modeling and Analysis	3			
ENGR 3310	Numerical Methods and Applications in Engineering	3			
ENGR 3110	Thermodynamics	4			
ENGR 3120	Fluid Mechanics	4			
ENGR 4110	Heat Transfer	4			
ENGR 4120	Machine Design	4			
ENGR 4900	Senior Design Project A	2			
ENGR 4910	Senior Design Project B	2			

CORE REQUIREMENTS:					
COGNATES (26 UNITS)					
		Units	Institution	Date	Grade
MATH 2310 or 2510	Calculus I	4			
MATH 2320 or 2520	Calculus II	4			
PHYS 2210	Physics for Scientists and Engineers I	4			
PHYS 2220	Physics for Scientists and Engineers II	4			
CHEM 1000	Foundations of Chemistry	3			
CHEM 1001	Introduction to Laboratory in Chemistry	2			
CHEM 1600	Foundations of Physical Chemistry	2			
PHIL 3318*	Professional Ethics	3			

ADDITIONAL COGNATES: MATHEMATICS AND SCIENCE (select at least 7 UNITS)

BIOL 2010, 2110 or 2120, CHEM 1100, 2200, 2300 or 2500, GEOL 2010, 2040, 3000, 3010, 3070, 4010, 4050, 4060 4150 or 4771, PHYS 2230, 3010, 3510, 3520, 4700, or 4800, or MATH 2330, 2531, 2532, 2533, 2540, 2610, 3000, 3200, 3210, 3300, 4500. (Biosystems & Agricultural Engineering Emphasis students must take BIOL 2010, 2110, or 2120; Petroleum Engineering Emphasis students must take GEOL 4060)

ELECTIVES: BIOSYSTEMS & AGRICULTURAL ENGINEERING EMPHASIS (UD ENGR 13 Units)

Courses		Units	Institution	Date	Grade
ENGR 3400	Soil and Water Resource Management	3			
ENGR 3410	Agricultural Machines and Instrumentation	4			
ENGR 4410	Environmental Engineering	3			
ENGR 4420	Food and Bioprocess Engineering Unit Operations	3			

ELECTIVES: ENERGY AND POWER ENGINEERING EMPHASIS (UD ENGR – 13 UNITS)

Courses		Units	Institution	Date	Grade
ENGR 4610	Conventional Energy Production	3			
ENGR 4620	Renewable Energy Production	3			
ECE 3370	Power Systems Fundamentals	4			
ECE 4380	Power System Operation with Renewable Energy Resources	3			

ELECTIVES: ENGINEERING MANAGEMENT EMPHASIS (UD ENGR – 13 UNITS)

Courses		Units	Institution	Date	Grade
ENGR 4200	Operations Research	3			
ENGR 4220	Project Management	3			
ENGR 4240	Quality Management	3			
ENGR 4260	Economics of Engineering Design	3			
	One additional unit that applies towards the BS in Engineering Sciences	1			

ELECTIVES: PETROLEUM ENGINEERING EMPHASIS (UD ENGR – 13 UNITS)

Courses		Units	Institution	Date	Grade
ENGR 4520	Petroleum Production Engineering	3			
ENGR 4530	Reservoir Engineering	4			
ENGR 4540	Drilling Engineering and Completion Technology	4			
	Two additional units that apply towards the BS in Engineering Sciences	2			

OTHER ELECTIVES:

Courses		Units	Institution	Date	Grade
ENGR 3070	Analog Electronics	3			
ENGR 4610	Conventional Energy Production	3			
ENGR 4620	Renewable Energy Production	3			
ENGR 4700	Special Topics in Engineering	1-3			
ENGR 4800	Research Participation	1-3			

Note: An emphasis in any of the three areas is not required – the 13 units of electives can be chosen from any subarea.

Note: Students must have a minimum of

1. College-level mathematics and basic sciences*: 30 semester units
2. Engineering** topics: 45 semester units

*PHIL 3318 does not count towards the 30 semester units.

**Not all ENGR courses qualify as engineering topics units. See advisor for details.

Approval:

Chair _____

Date _____