Engineering - Civil/Mechanical Option A.S. Degree

Engineering involves the application of scientific and mathematical principles used in designing and solving practical technical problems. The program provides the foundation in mathematics, physics, and engineering to transfer to a university and complete a B.S. in Engineering. However, meet with a counselor for assistance in meeting the specific transfer university's requirements.

Total Units: 77-83

First Year

Semester 1

12-15 Units

COURSE	UNITS	PRE-REQS^	SEMESTERS OFFERED*	GE AREA
CHEM 300[1] Z Beginning Chemistry	4	Elementary Algebra or higher	F, S, Su	
MATH 335[2] Z Trigonometry with College Algebra **or**	5	Geometry & MATH 120	F, S	CRC Area II(b)
MATH 370[2] Z Pre-Calculus Mathematics	5	MATH 335	F, S	CRC Area II(b)
CRC Area II(a)-Writing Competency Z	3	Recommend meeting with a counselor	F, S, Su	CRC Area II(a)
Elective[3]	0-3		F, S	

Z At least one section of this course is offered with free textbooks and is labeled as zero textbook costs (ZTC). If it is a GE area class or elective, there may be several ZTC offerings to fulfill the GE requirement. Use the Free Textbook filter to find these courses. Learn more on the ZTC page of the college website.

1 or 1 year of high school chemistry with lab.

2 If not completed in high school.

3 Suggestion-CISP 300 Algorithm Design/Problem Solving (3 units); Pre-req: MATH 120 or equivalent; F, S.

Semester 2

16-19 Units

COURSE	UNITS	PRE-REQS^	SEMESTERS OFFERED*	GE AREA
CHEM 400 Z General Chemistry I	5	Elementary Algebra and CHEM 300, 305, 309 or 1 yr of HS Chem with Lab	F, S, Su	CRC Area IV
MATH 400 Z Calculus I	5	MATH 370	F, S	CRC Area II(b)

Career Options/Outlook:

Civil engineers perform engineering duties in planning, designing, and overseeing the construction and maintenance of building structures, and facilities, such as roads, railroads, airports, bridges, harbors, channels, dams, irrigation projects, pipelines, power plants, and water and sewage systems. Mechanical engineers plan and design tools, engines, machines, and other mechanically functioning equipment. They oversee the installation, operation, maintenance, and repair of equipment. **Career opportunities require more than an associate degree.**

A sample of reported job titles:

Bridge/Structure Inspection Team Leader, City Engineer, Civil Engineer, Civil Engineering Manager, County Engineer, Design Engineer, Project Engineer, Railroad Design Consultant, Structural Engineer, Traffic Engineer; Application Engineer, Design Engineer, Design Maintenance Engineer, Equipment Engineer, Mechanical Design Engineer, Mechanical Engineer, Process Engineer, Product Engineer, Project Engineer, Test Engineer

Projected job openings in California (2020-2030):

2,140-4,320

COURSE	UNITS	PRE-REQS^	SEMESTERS OFFERED*	GE AREA
ENGR 312 Z Engineering Graphics	3	Advisory: MATH 110 or 120 or high school geometry	F, S	
CRC Area V(a)-American Institutions Z	3		F, S, Su	CRC Area V(a)
CRC Area II(a) if the MATH & CHEM in Semester 1 are not necessary Z	0-3	Recommend meeting with a counselor	F, S, Su	CRC Area II(a)

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Year 2

Semester 3

18 Units

COURSE	UNITS	PRE-REQS^	SEMESTERS OFFERED*	GE AREA
MATH 401 Z Calculus II	5	MATH 400	F, S	CRC Area II(b)
PHYS 411 Z Mechanics of Solids and Fluids	4	MATH 400	F, S, Su	CRC Area IV
CRC Area I-Humanities Z	3		F, S, Su	CRC Area I
CRC Area III(b)-Life Development Skills Z	3		F, S, Su	CRC Area III(b)
CRC Area V(b)-Social & Behavioral Sciences & CRC Area VI-Ethnic/Multicultural Studies[1] Z	3		F, S, Su	CRC Area V(b) & VI

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[1] Select a course that meets both Area V(b) and VI.

Semester 4

16 Units

COURSE	UNITS	PRE-REQS^	SEMESTERS OFFERED*	GE AREA

Projected job opening in California (2020-2030)

12%-17% growth

Median Salary in California with advanced degree (2021):

$101,230/yr-$101,710/yr

Source:

https://www.onetonline.org/link/summary/17-2051.00 & https://www.onetonline.org/link/summary/17-2141.00

Transfer notes:

Please meet with a counselor for specific transfer course evaluation or transferring to a specific 4-year institution.

General Education (GE):

Non-specified GE courses identified by CRC Area, CSU Area or IGETC Area without pre- or co-requisite can be taken at any semester.

Honors option:

The CRC Honors Program is designed specifically for academically accomplished students and for students with the potential for high achievement. Students who complete 15 units or more in honors-designated courses will earn special recognition as an Honors Scholar, a distinction that may entitle the student to guaranteed transfer and scholarship opportunities at select transfer colleges and universities.

COURSE	UNITS	PRE-REQS^	SEMESTERS OFFERED*	GE AREA
MATH 402 Z Calculus III	5	MATH 401	F, S	CRC Area II(b)
PHYS 421 Z Electricity and Magnetism	4	MATH 401 & PHYS 411	F, S	
ENGR 420 Z Statics	3	MATH 401 & PHYS 411	F, S	
CISP 360 Introduction to Structured Programming	4	CISP 300 or MATH 400	F(P), S(P)	CRC Area II(b)

Z At least one section of this course is offered with free textbooks and is labeled as zero textbook costs (ZTC). If it is a GE area class or elective, there may be several ZTC offerings to fulfill the GE requirement. Use the Free Textbook filter to find these courses. Learn more on the ZTC page of the college website.

Semester 5

15 Units

COURSE	UNITS	PRE-REQS^	SEMESTERS OFFERED*	GE AREA
MATH 420 Z Differential Equations	4	MATH 401; Advisory: MATH 402	F, S	CRC Area II(b)
ENGR 400 Z Introduction to Electrical Circuits and Devices	3	PHYS 421	F, S	
ENGR 412 Z Properties of Materials	4	CHEM 400 & PHYS 411	F, S	
CRC Area III(a)-Physical Edu Activity Z	1		F, S, Su	CRC Area III(a)
CRC Area VI-Ethnic/ Multicultural Studies Z	3		F, S, Su	CRC Area VI

Z At least one section of this course is offered with free textbooks and is labeled as zero textbook costs (ZTC). If it is a GE area class or elective, there may be several ZTC offerings to fulfill the GE requirement. Use the Free Textbook filter to find these courses. Learn more on the ZTC page of the college website.

^You must have passed the prerequisite course(s) with a “C” or better; Corequisite must be taken during the same semester; Advisory means it is recommended but not required to enroll in the course.

*(O) = online available (P) = partially online

About this program map:

This program map represents one possible pathway to complete the program. Please see a counselor to create an education plan that is customized to meet your needs. This map is not a guarantee of course

availability or financial aid applicability.

Zero Textbook Costs (ZTC):

The Zero Textbook Costs designation and logo are added to any course that provides free access to all required instructional materials. These are typically shared with students through Canvas. Courses that are designated as ZTC may still require students to purchase supplemental materials such as lab coats, a calculator, art supplies, etc. See full definitions and searching tips on the Zero Textbook Costs page of the college website.