

ORANGE COAST COLLEGE

TRANSFER CURRICULUM GUIDE

ENGINEERING

Bioengineering

LOWER DIVISION MAJOR REQUIREMENTS FOR TRANSFER

The following courses should be taken at OCC prior to transfer. Courses not offered at OCC will need to be taken after transfer unless otherwise noted. Four-year colleges and universities often make changes in their requirements for majors. The information contained in this guide is based on the most recent information available from the four-year school and does not constitute an official agreement.

Recent updates to this guide can be found on the Transfer Center Website at:

www.occ.cccd.edu/departments/studentsvcs/transferctr

UNIVERSITY OF CALIFORNIA, BERKELEY

Note: Admission to the College of Engineering is highly competitive. Selection is based on the completeness of lower division preparation, GPA and the applicant essay. The college reviews the essay for evidence of interest in the chosen field and a thoughtful match between the academic program and the academic and career objectives. You must complete **all** of the required lower division courses by the end of the spring term prior to fall enrollment to be eligible for admission. Summer coursework is not considered to be “work in progress” for fall selection. English 100 & 101(or 101H) must be completed with a letter grade and is a prerequisite for admission. IGETC is not acceptable for this major. When courses are listed as a series, you must complete entire series. No partial credit is given. All required and strongly recommended courses must be taken for a letter grade.

AP Credit for Engineering Majors:

Course	Score
Biology	score of 4 or 5 = BIOL 1A/AL & 1B
Chemistry	score of 3 or better = CHEM 1A/1AL
English	score of 4 or 5 = ENGL R1A
Calculus (AB/BC Exam)	score of 3 = MATH 1A
Calculus (BC Exam)	score of 4 or 5 = MATH 1AB
Physics (Mechanics C Exam)	score of 5 = PHYS 7A

Breadth Requirements:

1. ENGL 100 & 101(or 101H)
2. **Two 3-unit GE breadth courses from:** Arts & Literature, Historical Studies, International Studies, Philosophy & Values or Social & Behavioral Sciences
3. Two additional upper division courses taken after transfer.

BACHELOR OF SCIENCE BIOENGINEERING (College of Engineering)

UCB	OCC	(12/14:A16-17)
Required Courses:		
CHEM 1A/AL	CHEM 180	
MATH 1A	MATH 180(or 180H)*	
MATH 1B	MATH 185(or 185H)*	
MATH 53	MATH 280(or 280H)	
MATH 54	MATH 285(or 285H)	Continued

UCB	OCC	(12/14:A16-17)
PHYS 7A	PHYS 185	
PHYS 7B	PHYS 280	
ENGL R1AB	ENGL 100 & 101(or 101H)	
BIOL 1A/AL	BIOL 180 & 185	
CHEM 3A/AL	CHEM 220/220L	
Strongly recommended courses:		
CHEM 3B/BL	CHEM 225/225L	
ENGIN 10	No Equivalent Course	
COMPSCI 61A <u>or</u> ENGIN 7	No Equivalent Course <u>or</u> No Equivalent Course	
Two of the following:		
ENGIN 45/45L	No Equivalent Courses	
EL ENG 16AB	No Equivalent Courses	
COMPSCI 61B	CS 200 & 250	
CIV ENGR C30	No Equivalent Course	
MATH 55 <u>or</u> COMPSCI 70	MATH 230 <u>or</u> No Equivalent Course	
MEC ENG 40	No Equivalent Course	
*MATH 182H is also equivalent to MATH 1AB.		

UNIVERSITY OF CALIFORNIA, IRVINE

BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING

UCI	OCC	(12/14:A16-17)
MATH 2AB	MATH 180(or 180H) & 185(or 185H)*	
MATH 2D/2E	MATH 280(or 280H)	
MATH 3A	MATH 235 <u>or</u> 2805(or 285H)	
MATH 3D	MATH 285(or 285H)	
PHYS 7CDE, LC/LD	PHYS 185 & 280 & 285	
CHEM 1ABC, LC	CHEM 180 & 185**	
BME 1	No Equivalent Course	
BME 50AB	No Equivalent Courses	
BME 60ABC	No Equivalent Courses	
STATS 8	MATH 160(or 160H) <u>or</u> PSYC 160+	
*MATH 182H will also satisfy this requirement.		
**Articulation based on entire sequence - complete entire year.		
+PSYC 160 will not satisfy IGETC Area 2 - Mathematical Concepts and Quantitative Reasoning. Students wishing to satisfy IGETC Area 2 should take MATH 160(or 160H).		
Important Note: Preference is given to students with the highest grades overall who have completed the required courses with a grade of "C" or better by the end of the spring term prior to transfer.		

BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING - PRE MEDICAL

UCI	OCC	(12/14:A16-17)
MATH 2AB	MATH 180(or 180H) & 185(or 185H)*	
MATH 2D/2E	MATH 280(or 280H)	
MATH 3A	MATH 235 <u>or</u> 2805(or 285H)	
MATH 3D	MATH 285(or 285H)	
PHYS 7CDE, LC/LD	PHYS 185 & 280 & 285	
CHEM 1ABC, LC/LD	CHEM 180 & 185**	
BIO SCI 97	BIOL 283	
BIO SCI 98	BIOL 281	
BIO SCI 99	BIOL 282(or 282H)	
BIO SCI 100	No Equivalent Course	
BME 1	No Equivalent Course	
BME 60ABC	No Equivalent Courses	Continued

UCI	OCC	(12/14:A16-17)
CHEM 51ABC, LB/LC	CHEM 220/220L & 225/225L	
*MATH 182H will also satisfy this requirement. **Articulation based on entire sequence - complete entire year.		
Important Note: Preference is given to students with the highest grades overall who have completed the required courses with a grade of "C" or better by the end of the spring term prior to transfer.		

UNIVERSITY OF CALIFORNIA, RIVERSIDE

General Education Requirements for All Degrees

UCR	OCC
ENGL 1ABC	ENGL 100 & either 101(or 101H) or 102(or 102H) or ENGL 109 or PHIL 150
Humanities	HIST 161(or 161H) or 162(or 162H) One course from: ART 100, 100H, 101, 101H, 102, 103, ENGL 150, 150H, 160, 160H, 161, 161H, 170, 170H, 176, 176H, 181, 181H, 270, 270H, 275, 275H, MATH 220, MUS 100, PHIL 100, 120, 220, RLST 120, 150
Social Sciences	One course from: ECON 170, 175, PSCI 110, 180, 180H, 185
Ethnicity	One course from: ANTH 100, 100H, 102*, 185, 280, ETHS 100*, 150*, HIST 101*, PSYC 100, 100H, SOC 100, 100H, 185, 185H
Natural Sciences & Mathematics	Satisfied by lower division courses required for the major.
*The following courses will satisfy both the Social Science Area and campus graduation requirement in Ethnicity.	

BACHELOR OF SCIENCE IN BIOENGINEERING

UCR	OCC	(11/14:A16-17)
Courses Required for Admission:		
CHEM 1ABC w/labs	CHEM 180 & 185	
MATH 9ABC	MATH 180(or 180H) & 185(or 185H)*	
BIOL 5A/LA	BIOL 180	
Courses strongly recommended prior to transfer:		
BIOL 5B	BIOL 185 or 182/182L & 183/183L**	
PHYS 40A	PHYS 185**	
PHYS 40B	PHYS 185 & 285**	
PHYS 40C	PHYS 280**	
Organic Chemistry	CHEM 220/220L & 225/225L	
CS 10	CS 122 or 131 or 140 or 150 or 170	
EE 1A/1LA	ENGR 285	
MATH 10AB	MATH 280(or 280H)	
MATH 46	MATH 285(or 285H)	
3 Humanities or Social Science breadth courses from GE Requirements.		
*MATH 182H is also equivalent to MATH 9ABC. **Two of these courses must be taken prior to transfer.		
Note: This major is selective. Students are strongly encouraged to focus on preparatory course work for the major rather than IGETC. Students must attain a GPA of at least 2.8 in all UC transferable courses. Also required is a 2.5 GPA in the calculus sequence and in at least one additional sequence (chemistry, physics, second year calculus or biology). AP credit can be accepted in lieu of college course work for Math and Computer Science. Consult the College of Engineering at: (951) 827-3647.		

CALIFORNIA STATE UNIVERSITY, LONG BEACH

BACHELOR OF SCIENCE IN ENGINEERING

Option in Biomedical and Clinical

CSULB	OCC	(12/14:A16-17)
BIOL 207	BIOL 225	
CHEM 111A	CHEM 180	
E E 200	No Equivalent Course	
E E 201	No Equivalent Course	
E E 202	No Equivalent Course	
E E 211/211L	ENGR 285	
ENGR 101 & 102	No Equivalent Courses**	
MATH 122 & 123	MATH 180(or 180H) & MATH 185(or 185H)*	
MATH 224	MATH 280(or 280H)	
PHYS 151 & 152	PHYS 185 & 280	
PHYS 254	PHYS 285	
*MATH 182H is also equivalent to MATH 122 & 123.		
**Requirement waived for transfer students who have completed 3 units in CSU GE Area E.		
<p>Note: This major is impacted. See CSULB catalog for supplemental major specific admission criteria. Transfer students must complete 60 units or more and the CSU GE requirements in Written and Oral Communication, Critical Thinking and Mathematics/Quantitative Reasoning with a grade of "C" or better by the end of the prior spring term for fall admission or by the end of the prior summer for spring admission. Critical thinking may be waived as this is integrated throughout the engineering baccalaureate programs. Students are encouraged to take as many of these courses prior to transfer as possible. A grade of "C" or better must be achieved in all required major courses.</p>		

CAL POLY, SAN LUIS OBISPO

BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING

CPSLO	OCC	(10/12:A16-17)
Major Courses		
BMED 101	No Equivalent Course	
BMED 102	No Equivalent Course	
BMED 212	No Equivalent Course	
Support Courses		
BIO 161	No Equivalent Course	
CHEM 124 & 125	CHEM 180 & 185	
ENGL 149	ENGL 105*	
MATH 141, 142, 143, 241	MATH 180(or 180H) & 185(or 185H) & 280(or 280H)+	
MATH 244	MATH 285(or 285H)	
PHYS 131, 132, 141	PHYS 185 & 280 & 285	
CE 204 & 207	No Equivalent Courses	
ME 228	No Equivalent Course	
CSC 231	No Equivalent Course	
E E 201	ENGR 285	
MATE 210	No Equivalent Course	
ME 211	ENGR 280	
ME 212	No Equivalent Course	
BIO 231 & 232	No Equivalent Courses	
Approved Support Electives		
CHEM 216	CHEM 220/220L**	
CHEM 217	CHEM 225/225L**	
MCRO 224	BIOL 210	
*Credit only when additional GE Area A3 course is completed.		
**No upper division credit.		
+MATH 182H & 280H is also equivalent to MATH 141, 142, 143, & 241.		

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Note: Selection criteria for transfer students can be found at:

<http://admissions.calpoly.edu/applicants/transfer/criteria.html>

UNIVERSITY OF SOUTHERN CALIFORNIA

Note: Students may fulfill four of the six required GE requirements with transfer courses taken before starting USC (see USC GE requirements). Credit for courses is not granted if (1) the course is taken before high school graduation, (2) the grade is lower than C-, (3) is a lab science or foreign language course and is not taken in a traditional classroom setting, (4) is offered through "study abroad", (5) repeats credit from another college course or from an AP or IB exam.

BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING

USC	OCC	(10/12:A16-17)
WRIT 130	ENG 101 (or 101H) <u>or</u> 102 (102H)*	
Global Perspectives	ANTH 150 <u>or</u> PSCI 110 <u>or</u> SOC 150	
Traditions & Historical	One course from: ARCH 290(or 290H), 296(or 296H), ART 100(or 100H), 101(or 101H), 103, ENGL 176(or 176H), HIST 141, 161(or 161H), 162(or 162H), 170(or 170H), 175(or 175H), 180(or 180H), 185(or 185H), PHIL 125, PSCI 188, RLST 110, 140, 150, THEA 101	
CHEM 105AB	CHEM 180 & 185	
CHEM 322AB	CHEM 220/220L & 225/225L	
BISC 220	BIOL 180(or 180H) & 182/182L & 183/183L <u>or</u> BIOL 180(or 180H) & 185	
PHYS 151 & 152	PHYS 185, 280 & 285	
MATH 125 & 126	MATH 180(or 180H) & 185(or 185H or 182H)**	
MATH 226	MATH 280(or 280H)	
MATH 245	MATH 285(or 285H)	
*Course must be taken for a letter grade. **MATH 182H is equivalent to MATH 126.		

BACHELOR OF SCIENCE IN BIOMEDICAL ENGINEERING – Biochemical Engineering

USC	OCC	(10/12:A16-17)
WRIT 130	ENG 101 (or 101H) <u>or</u> 102 (102H)*	
Global Perspectives	ANTH 150 <u>or</u> PSCI 110 <u>or</u> SOC 150	
Traditions & Historical	One course from: ARCH 290(or 290H), 296(or 296H), ART 100(or 100H), 101(or 101H), 103, ENGL 176(or 176H), HIST 141, 161(or 161H), 162(or 162H), 170(or 170H), 175(or 175H), 180(or 180H), 185(or 185H), PHIL 125, PSCI 188, RLST 110, 140, 150, THEA 101	
CHEM 105AB	CHEM 180 & 185	
CHEM 322AB	CHEM 220/220L <u>or</u> 225/225L	
BISC 220	BIOL 180(or 180H) & 182/182L & 183/183L <u>or</u> BIOL 180(or 18H) & 185	
PHYS 151 & 152	PHYS 185, 280 & 285	
MATH 125 & 126	MATH 180(or 180H) & 185(or 185H or 182H)**	
MATH 226	MATH 280(or 280H)	
MATH 245	MATH 285(or 285H)	
*Course must be taken for a letter grade. **MATH 182H is equivalent to MATH 126.		

ADDITIONAL AGREEMENTS ARE AVAILABLE ON THE INTERNET FOR THE FOLLOWING SCHOOLS AT:

www.assist.org

Campus	Campus	
UC Davis (Biochemical/Biomedical)	UC Irvine (Biomedical)	Continued

<i>Campus</i>	<i>Campus</i>
UC Los Angeles (Bioengineering)	UC Merced (Bioengineering)
UC Merced (Bioengineering)	UC Santa Cruz (Bioengineering)
UC San Diego (Bioengineering)	San Jose State (Bioengineering)