

# ORANGE COAST COLLEGE

## TRANSFER CURRICULUM GUIDE

### ENGINEERING

#### Electrical Engineering

#### **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](http://www.occ.cccd.edu/departments/studentsvcs/transferctr)

#### **UNIVERSITY OF CALIFORNIA, BERKELEY**

**Notes:** 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.

#### **Breadth Requirements:**

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

#### **AP Credit for Engineering Majors:**

<b>Course</b>	<b>Score</b>
Biology	score of 4 or 5 = BIOL 1A/AL & 1B
Chemistry	score of 3, 4 or 5 = 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

#### **BACHELOR OF SCIENCE ELECTRICAL ENGINEERING & COMPUTER SCIENCES (College of Engineering)**

<b>UCB</b>	<b>OCC</b>	<b>(9/17:A16-17)</b>
<b>Required Core Courses:</b>		
MATH 1A	MATH 180(or 180H)*	
MATH 1B	MATH 185(or 185H)*	
MATH 53	MATH 280(or 280H)	
MATH 54	MATH 285(or 285H)	
PHYS 7A	PHYS 185	
PHYS 7B	PHYS 280	<b>Continued</b>

<b>UCB</b>	<b>OCC</b>	<b>(9/17:A16-17)</b>
ENGL R1AB	ENGL 100 & 101(or 101H)	
<b>One additional natural science course selected from:</b>		
ASTRON 7A	ASTR 103	
ASTRON 7B	No Equivalent Course	
BIOL 1A/AL	BIOL 180 & 185	
BIOL 1B	BIOL 185 & 183/183L	
CHEM 1A/AL	CHEM 180	
CHEM 1B	CHEM 185	
CHEM 3A/AL	CHEM 220 & 220L	
CHEM 3B/BL	CHEM 225 & 225L	
MCELLBI 32/32L	BIOL 225	
PHYSICS 7C	PHYS 285	
<b>Strongly Recommended Courses:</b>		
COMPSCI 61A	No Equivalent Course	
COMPSCI 61B	CS 200 & 250	
COMPSCI 61C	No Equivalent Course	
EL ENG 16AB	No Equivalent Courses**	
COMPSCI 70	No Equivalent Course	
*MATH 182H is also equivalent to MATH 1AB.		
**Students are strongly encouraged to take an introductory course in electronics or circuits and Java, C++ and Data Structures.		

## UNIVERSITY OF CALIFORNIA, IRVINE

### BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

<b>UCI</b>	<b>OCC</b>	<b>(09/17:A16-17)</b>
<b>Required Courses</b>		
MATH 2AB	MATH 180(or 180H) & 185(or 185H)*	
MATH 2D <u>or</u> 2E	MATH 280(or 280H)	
MATH 3A	MATH 235 <u>or</u> 280(or 285H)	
MATH 3D	MATH 285(or 285H)	
PHYS 7CDE, LC/LD	PHYS 185 & 280 & 285	
EECS 10	CS 150	
EECS 70A	ENGR 285	
EECS 70LA	No Equivalent Course	
<b>Additional Major Requirements</b>		
PHYS 51A	No Equivalent Course	
ENGR 1A <u>or</u> CHEM 1A	No Equivalent Course <u>or</u> CHEM 180	
EECS 1	No Equivalent Course	
EECS 31/31L	No Equivalent Courses	
EECS 50	No Equivalent Course	
EECS 55	No Equivalent Course	
EECS 70B/LB	No Equivalent Courses	
<b>Additional Electives</b>		
PHYS 52A	PHYS 285	
ENGR 54	No Equivalent Course	
EECS 20	CS 150 & 216	
EECS 22	No Equivalent Course	
*MATH 182H & 280(or 280H) will also satisfy this requirement.		
<b>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.</b>		

# UNIVERSITY OF CALIFORNIA, LOS ANGELES

## Requirements for Admission:

Admission to an engineering major as a junior level transfer is very competitive. All courses must be taken for a letter grade. The most important selection criteria are completion of required prep courses and academic performance. A minimum transferable cumulative GPA of 3.4 is required for consideration. Prep courses should be completed by the end of the spring term prior to fall enrollment. Alternate major applicants will not be considered. Breadth and GE requirements may be fulfilled by completion of IGETC. Although not required to complete the HSEAS GE requirements for admission, it is beneficial for students to complete one course from each of the following areas: arts, humanities, social sciences and life sciences. Partial IGETC is not accepted. Visit the listed websites for further information: <http://www.engineer.ucla.edu> and <http://www.admissions.ucla.edu>

## BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

UCLA	OCC	(09/17:A16-17)
<b>Courses Required for Admission:</b>		
CHEM 20A	CHEM 180	
MATH 31AB	MATH 180(or 180H) & 185(or 185H)*	
MATH 32AB	MATH 280(or 280H)	
MATH 33AB	MATH 285(or 285H)	
PHYS 1ABC, 4AL/BL	PHYS 185, 280 & 285**	
ENGCAMP 3	ENGL 100	
Computer Programming	CS 250	
<b>A second course in English composition from:</b> ENGL 101, 101H, 102, 102H, PHIL 150		
<b>Additional Requirements (Strongly Recommended):</b>		
COM SCI 31	CS 150	
COM SCI 32	CS 200	
COM SCI M51A	No Equivalent Course	
*MATH 182H is also equivalent to MATH 31AB.		
**Entire physics sequence should be completed at OCC.		

# 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) <b>One course from:</b> 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	<b>One course from:</b> ECON 170, 175, PSCI 110, 180, 180H, 185
Ethnicity	<b>One course from:</b> 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 ELECTRICAL ENGINEERING

UCR	OCC	(09/17:A16-17)
<b>Courses Required for Admission:</b>		
CS 10	CS 122 or 131 140, 150 or 170	
CS 61	No Equivalent Course	
MATH 9ABC	MATH 180(or 180H) & 185(or 185H)*	
PHYS 40ABC	PHYS 185, 280, 285	Continued

<b>UCR</b>	<b>OCC</b>	<b>(09/17:A16-17)</b>
<b>Courses strongly recommended prior to transfer</b>		
CS 12 <b>or</b> 13	CS 250+ <b>or</b> No Equivalent Course	
EE 1A/1LA	ENGR 285+	
EE 1B	No Equivalent Course+	
MATH 10AB	MATH 280(or 280H)+	
MATH 46	MATH 285(or 285H)+	
CHEM 1A/LA	CHEM 180	
EE 20	No Equivalent Course	
Biology w/lab	BIOL 100	
Two Humanities or Social Science breadth courses listed in GE requirements for all degrees.		
<b>Courses to be completed after transfer:</b>		
EE 10	No Equivalent Course	
**MATH 182H is also equivalent to MATH 9ABC +One of these courses must be taken prior to transfer		
<b>Note: This major is selective. Students are admitted Fall quarter only. Take all courses for a letter grade except for Humanities and Social Sciences. 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 some college course work. Consult the College of Engineering at: (951) 827-3647.</b>		

## UNIVERSITY OF CALIFORNIA, SANTA BARBARA

### BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

<b>UCSB</b>	<b>OCC</b>	<b>(09/17:A16-17)</b>
<b>Required base preparation courses:</b>		
MATH 3AB	MATH 180(or 180H) & 185(or 185H)*	
MATH 4AB	MATH 285(or 285H)	
PHYS 1, 2, 3/3L, 4/4L, 5/5L	PHYS 185, 280, 285	
ENGR 3	No Equivalent Course	
CMPSC 16	CS 150	
<b>Strongly recommended advanced preparation courses:</b>		
ECE 2A <b>or</b> 10A/AL	ENGR 285 <b>or</b> No Equivalent Courses	
ECE 15A	CS 216	
MATH 6AB	MATH 280(or 280H)	
CHEM 1A/AL	CHEM 180 **	
<b>Additional major prep courses:</b>		
ECE 2B <b>or</b> ECE 10B/BL	No Equivalent Courses	
ECE 2C <b>or</b> ECE 10C/CL	No Equivalent Courses	
ECE 5	No Equivalent Course	
*MATH 182H is also equivalent to MATH 3AB. **Not satisfied by AP or IB.		
<b>Note: Transfer students may complete IGETC or the College of Engineering general education. Students who choose to follow College of Engineering GE should complete two to three general education courses prior to transfer. See ASSIST for requirements. Students are strongly advised to complete as many major prep courses as possible prior to transferring. Major prep courses must be completed with a grade of "C" or better. The required GPA in required prep courses is 3.6.</b>		

## CALIFORNIA STATE UNIVERSITY, FULLERTON

<b>General Education Requirements for All Degrees:</b>	
A.1 CMST 100 <b>or</b> 110	
A.2 ENGL 100	
A.3 ENGL 101(or 101H), 102(or 102H), 109, MATH 220, PHIL 150, 155, 220, <b>or</b> CMST 220, 240	
B.1/B.3 & B.4 Part of Math & Science Foundation Course Requirement	
B.2 Waived for engineering majors	

Continued

## General Education Requirements for All Degrees:

C.1 Any approved CSU GE Area C1 course

C.2 Any approved CSU GE Area C2 course

C.3. Upper division courses

C.4 HIST 161(or 161H) or 162(or 162H)

D.1 Upper division course

D.3 HIST 170(or 170H), 175(or 175H)

D.4 PSCI 180(or 180H)

D.5 Not applicable for engineering majors

E. Waived for engineering majors

Z. Asterisked course from C.3

## BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

<b>CSUF</b>	<b>OCC</b>	<b>(3/15:A15-16)</b>
<b>Required Courses</b>		
CHEM 123	No Equivalent Course	
MATH 150AB	MATH 180(or 180H)@ & 185(or 185H)	
MATH 250AB	MATH 280(or 280H) & 285(or 285H)	
PHYS 225/225L	PHYS 185	
PHYS 226/226L	PHYS 280	
PHYS 227/227L	PHYS 285	
<b>Core Courses</b>		
CPSC 120	CS 150	
EGEE 203/203L	ENGR 285@	
EGEE 215	No Equivalent Course	
EGEE 245/245L	No Equivalent Courses	
EGCP 280	No Equivalent Course	
EGCP 281	No Equivalent Course	
@Grade of "C" or better required.		
<b>Note: All math and physical science courses must be completed with at least a "C" grade.</b>		

## CALIFORNIA STATE UNIVERSITY, LONG BEACH

### BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

<b>CSULB</b>	<b>OCC</b>	<b>(3/15:A16-17)</b>
E E 186	No Equivalent Course	
E E 200	No Equivalent Course	
E E 201 & 202	No Equivalent Courses	
E E 211/211L	ENGR 285	
ENGR 101 & 102	No Equivalent Courses*	
MATH 122 & 123	MATH 180(or 180H) & 185(or 185H)**	
MATH 224	MATH 280(or 280H)	
PHYS 151	PHYS 185	
E E 210/210L <u>or</u> PHYS 152	No Equivalent Course <u>or</u> PHYS 280	
PHYS 254 <u>or</u> E E 220	PHYS 285 <u>or</u> No Equivalent Course	
*Requirement waived for transfer students who have completed 3 units in CSU GE Area E.		
**MATH 182H is also equivalent to MATH 122 & 123.		
<b>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.</b>		

**BACHELOR OF SCIENCE IN ELECTRONICS ENGINEERING TECHNOLOGY**

<b>CSULB</b>	<b>OCC</b>	<b>(09/17:A16-17)</b>
MAE 172	ENGR 180 <u>or</u> MACH 152	
MATH 122	MATH 180(or 180H)*@	
ENGR 101 & 102	No Equivalent Courses@	
ENGR 203/203L	MATH 185*+	
PHYS 100AB	PHYS 120 & 125@ <u>or</u> 130 & 135@	
E T 101	No Equivalent Course@	
E T 202	MATH 160 <u>or</u> PSYC 160@	
E T 202L	No Equivalent Course@	
E T 205/205L	No Equivalent Courses@	
E T 250/250L	ELEC 150@	
E T 252/252L	ELEC 155@	
E T 255/255L	ELEC 135@	
E T 260/260L	ELEC 260@	
E T 286/286L	No Equivalent Courses	
+Requirement waived for transfer students who have completed 3 units in CSU GE Area E.		
*MATH 182H is also equivalent to MATH 122.		
@Grade of "C" or better is required.		
<b>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.</b>		

**CAL POLY, POMONA****BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING**

<b>CPP</b>	<b>OCC</b>	<b>(09/17:A16-17)</b>
<b>Required Core Courses</b>		
ECE 109/109L	No Equivalent Courses	
ECE 114/114L	No Equivalent Courses	
ECE 204/204L	No Equivalent Courses	
ECE 205/205L	No Equivalent Courses	
ECE 207/207L	No Equivalent Courses	
ECE 209/209L	No Equivalent Courses	
ECE 220/220L	No Equivalent Courses	
ECE 256 <u>or</u> 257	No Equivalent Courses	
<b>Required Support Courses</b>		
CHM 121/L & 122L,	CHEM 180	
MAT 114, 115, 116	MATH 180(or 180H) & 185(or 185H)*	
MAT 214, 215	MATH 280(or 280H)	
MAT 224	MATH 285(or 285H)	
PHYS 131/L, 132/L, 133/L	PHYS 185, 280, 285 <u>or</u> 130, 135, 285	
*MATH 182H is also equivalent to MAT 114, 115, 116.		
<b>Note: This program is impacted and requires a supplementary admission process.</b>		

**SAN DIEGO STATE UNIVERSITY****BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING**

<b>SDSU</b>	<b>OCC</b>	<b>(09/17:A16-17)</b>
MATH 150 & 151	MATH 180(or 180H) & 185(or 185H)*+	
MATH 252	MATH 280(or 280H)	<b>Continued</b>

<b>SDSU</b>	<b>OCC</b>	<b>(09/17:A16-17)</b>
MATH 254	MATH 235	
A E 280	MATH 285(or 285H)	
PHYS 195/L & 196/L	PHYS 185(or 185H) & 280+	
E E 210	ENGR 285+	
BIOL 100 <b>or</b> 101	BIOL 100(or 100H) <b>or</b> No Equivalent Course	
COMPE 160	No Equivalent Course+	
COMPE 270 & 271	No Equivalent Courses	
*MATH 182H is also equivalent to MATH 150 & 151.		
+Requires a letter grade of "C" or higher. May not be taken CR/NC.		
<b>Note: This program is impacted and requires a minimum 2.7 GPA.</b>		

## CAL POLY, SAN LUIS OBISPO

### BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

<b>CPSLO</b>	<b>OCC</b>	<b>(09/17:A16-17)</b>
<b>Major Courses</b>		
EE 111/151	No Equivalent Courses	
EE 112, 211/241	ENGR 285	
CPE 133	No Equivalent Course	
EE 212/242	No Equivalent Courses	
EE 228	No Equivalent Course	
EE 233	No Equivalent Course	
EE 255/295	No Equivalent Courses	
<b>Support Courses</b>		
BIO 213 <b>or</b> BRAE 213	No Equivalent Courses	
CHEM 124	CHEM 180	
CSC 101	CS 150 <b>or</b> 170 <b>or</b> 250	
ENGL 149	ENGL 105*	
IME 156 <b>or</b> 157	No Equivalent Courses	
MATH 141, 142, 143, 241	MATH 180(or 180H) & 185(or 185H) & 280(or 280H)+	
MATH 244	MATH 285(or 285H)	
PHYS 132, 133 & 141	PHYS 185 & 280 & 285	
PHYS 211	No Equivalent Course	
<b>9 units of support electives from:</b> BIOL 100, CHEM 220/220L, ENGR 280, MATH 105 & 110, WELD 140 & 200		
*Credit only when additional GE Area A3 course is completed.		
+MATH 182H & 280H is also equivalent to MATH 141, 142, 143 & 241.		
<b>Note: Selection criteria for transfer students can be found at: <a href="http://admissions.calpoly.edu/applicants/transfer/criteria.html">http://admissions.calpoly.edu/applicants/transfer/criteria.html</a></b>		

## 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 ELECTRICAL ENGINEERING

<b>USC</b>	<b>OCC</b>	<b>(09/17:A16-17)</b>
WRIT 130	ENG 101 (or 101H) <b>or</b> 102 (102H)*	
Global Perspectives	ANTH 150 <b>or</b> PSCI 110 <b>or</b> SOC 150	
Traditions & Historical	<b>One course from:</b> 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	<b>Continued</b>

<b>USC</b>	<b>OCC</b>	<b>(09/17:A16-17)</b>
CHEM 105A	CHEM 180	
PHYS 151, 152 & 153	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)	
BISC 120	BIOL 180 & 185 <u>or</u> 180 & 182/182L & 183/183L	
<p>*Course must be taken for a letter grade.            +Subject credit for MATH 180(or 180H) can be earned by successful completion of MATH 185(or 185H). Subject credit for MATH 180(or 180H) &amp; 185(or 185H) can be earned by successful completion of MATH 280(or 280H).</p>		

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

[www.assist.org](http://www.assist.org)

<b>Campus</b>	<b>Campus</b>
UC Davis	UC Merced
UC San Diego	UC Santa Cruz
CSU Bakersfield	CSU Chico
CSU East Bay	CSU Los Angeles
CSU Northridge	CSU Sacramento
CSU San Bernardino	San Francisco State
San Jose State	Sonoma State