

Electrical Engineering, Electrical and Electronic Engineering

LOWER-DIVISION TRANSFER PATTERN California State University (CSU) Statewide Pattern

The Lower-Division Transfer Pattern (LDTP) consists of the CSU statewide pattern of coursework outlined below, plus campus-specific coursework, bringing the total pattern to at least 60 but no more than 70 transferable semester units for students to complete at a California Community College (CCC).

The CSU statewide pattern of coursework for CCC students who plan to major in Electrical Engineering or Electrical and Electronic Engineering at any CSU campus offering the major includes:

- Partial completion of lower-division general education requirements, following the CSU General Education-Breadth pattern;
- Completion of the CSU graduation requirements in United States History, Constitution and American Ideals; and
- Completion of additional semester units as specified below in (3-7).

Please note that the information here is an academic and curricular advising tool: a roadmap that enables transfer students to efficiently and effectively progress towards the CSU baccalaureate degree in a specified discipline. California Community College students should work closely with their advisers when planning their academic program in preparation for transfer to the CSU.

This information does not represent any guarantee with regard to admission nor does it include or replace CSU campus admissions impaction criteria (see <http://www.calstate.edu/AR/impactioninfo.shtml>). These curricular guidelines are subject to change.

CSU Statewide Pattern	Semester Unit Requirement
<p>(1) Complete the following lower-division general education requirements areas:</p> <ul style="list-style-type: none"> • A course that articulates with CSU GE Breadth AREA A1, Oral Communication. <u>And</u> • A course that articulates with CSU GE Breadth AREA A2, Written Communication. <u>And</u> • Two courses that articulates with CSU GE Breadth AREA C, Arts, and Humanities. • A course that articulates with CSU GE Breadth AREA D, Social, Political, and Economic Institutions and Behavior, Historical Background. <p><i>A minimum grade of C is required in courses used to meet CSU GE Breadth AREA A.</i></p>	15 units
<p>(2) Complete the graduation requirements in United States History, Constitution, and American Ideals.</p> <p>These are typically completed with one course each in American government and American history, or a sequence of courses that integrate the history and government topics.</p>	6 units
<p>(3) Complete courses that articulate with the Single Variable Calculus Sequence.</p> <p><i>One of these courses is used to complete the CSU GE Breadth AREA B4 requirement.</i></p>	8 units
<p>(4) Complete a course that articulates with Multivariable Calculus.</p>	4 units
<p>(5) Complete <u>all</u> of the following:</p> <ul style="list-style-type: none"> • A course that articulates with Physics – Calculus Based I [CAN PHYS 8]. <u>And</u> • A course that articulates with Physics – Calculus Based II [CAN PHYS 	7 units

12]. <i>One of these requirements must include a lab component that satisfies CSU GE Breadth AREA B3. One of these requirements is used to satisfy the CSU GE Breadth AREA B1 requirement.</i>	
(6) Complete a course that articulates with Programming Concepts and Methodology I [CAN CSCI 22].	3 units
(7) Complete a course that articulates with Circuits [CAN ENGR 12].	3 units
Total Semester Units Required for Statewide LDTP Pattern	46 Units

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
CSU Bakersfield Campus-Specific Pattern**

This campus does not have a major, concentration, or option in Electrical Engineering, Electrical, and Electronic Engineering.

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
CSU Channel Islands Campus-Specific Pattern**

This campus does not have a major, concentration, or option in Electrical Engineering, Electrical, and Electronic Engineering.

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
CSU Chico Campus-Specific Pattern**

In addition to the statewide pattern, the following is the CSU Chico campus-specific pattern:

Campus-Specific Pattern	Semester Unit Requirement
<p>(1) If not taken as part of the statewide pattern complete <u>all</u> of the following:</p> <ul style="list-style-type: none"> • A course that articulates with [CSUC PHYS 204C], <u>Physics III.</u> <u>And</u> • A course that articulates with [CSUC MATH 260], <u>Differential Equations.</u> <u>And</u> • A course that articulates with [CSUC EECE 144], <u>Logic Design Fundamentals -</u> Definition and properties of switching algebra. Minimization of algebraic function. Use of Karnaugh maps for simplification. Design of combinational logic networks. Design of sequential logic devices including flip-flops, registers, and counters. Analysis and applications of digital devices. Analysis and design of synchronous and asynchronous sequential state machines, state table derivation and reduction. Use of such CAD tools for schematic capture and logic device simulations. <u>And</u> • A course that articulates with [CSUC EECE 221], <u>Processor Architecture/Assembly Language Programming.</u> <u>And</u> • A course that articulates with <u>CSU GE Breadth AREA B2, Life Science.</u> <u>And</u> • A course that articulates with [CSUC EECE 101], <u>Introduction to Electrical and Computer Engineering -</u> A survey of topics from the fields of electrical and computer engineering that also covers applications of critical thinking to the solution of engineering problems and using the computer and sensors to control mechanical devices. <u>And</u> • A course that articulates with [CSUC CHEM 111], <u>Chemistry.</u> 	<p>0-4 units</p> <p>0-4 units</p> <p>0-4 units</p> <p>0-3 units</p> <p>0-3 units</p> <p>0-2 units</p> <p>0-4 units</p>
<p>(2) If not taken as part of the statewide pattern complete the following additional units:</p> <ul style="list-style-type: none"> • A course that articulates with [CSUC EECE 211L], <u>one additional unit for Circuits Lab.</u> 	<p>0-1 units</p>
<p>(3) If necessary, complete additional coursework to bring total to 60 transferable semester units.</p>	

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
CSU Dominguez Hills Campus-Specific Pattern**

This campus does not have a major, concentration, or option in Electrical Engineering, Electrical, and Electronic Engineering.

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
CSU East Bay Campus-Specific Pattern**

This campus does not have a major, concentration, or option in Electrical Engineering, Electrical, and Electronic Engineering.

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
CSU Fresno Campus-Specific Pattern**

In addition to the statewide pattern, the following is the CSU Fresno campus-specific pattern for the B.S. Electrical Engineering:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete <u>all</u> of the following:	
<ul style="list-style-type: none"> • If a CSU GE Breadth Area C1 requirement was not completed as part of the statewide pattern complete a course that articulates with CSU GE-Breadth AREA C1, Art (Art, Dance, Music, Theater). <u>And</u> 	0-3 units
<ul style="list-style-type: none"> • A course that articulates with [CSUF CHEM 3A], <u>Introductory General Chemistry</u> - Composition of matter and physical and chemical changes; fundamental laws and principles; atomic and molecular structure; acid-base theory, redox and equilibria; qualitative and quantitative theory and techniques. <u>And</u> 	0-4 units
<ul style="list-style-type: none"> • A course that articulates with [CSUF BIOL 10], <u>Life Science</u> - How living things work and why they work that way. Biology from chemical and physical foundations to ecological and evolutionary processes. Biology and its relationship to human affairs. <u>And</u> 	0-3 units
<ul style="list-style-type: none"> • A course that articulates with [CSUF ECE 1], <u>Introduction to Electrical and Computer Engineering</u> - A course that covers the electrical and computer engineering professions, career opportunities and preparation, exposure to computer productivity tools, laboratory safety, and hands-on projects. <u>And</u> 	0-1 unit
<ul style="list-style-type: none"> • A course that articulates with [CSUF ECE 2], <u>Introduction to Electrical and Computer Engineering Tools</u>- Intro to engineering application use of Matlab software in analysis and synthesis, basic commands, data arrays, plotting and data presentation, data transfer, computation with loops, iterative solutions, integration with C programming, and technical problem solving. <u>And</u> 	0-2 units
<ul style="list-style-type: none"> • A course that articulates with [CSUF ECE 85 & 85L] <u>Digital Design with Lab</u>. <u>And</u> 	0-4 units
<ul style="list-style-type: none"> • A course that articulates with [CSUF ECE 90L], <u>Principles of Electrical Circuits Laboratory</u>. <u>And</u> 	0-1 unit
<ul style="list-style-type: none"> • A course that articulates with [CSUF ME 29], <u>Static/Dynamics</u>. <u>And</u> 	0-3 units
<ul style="list-style-type: none"> • A course that articulates with [CSUF PHYS 4BL], <u>Laboratory in Electricity, Magnetism, and Heat</u> - Experiments in electricity, magnetism, heat, and thermodynamics. <u>And</u> 	0-1 unit
<ul style="list-style-type: none"> • A course that articulates with [CSUF PHYS 4C], <u>Light and Modern Physics</u>- Maxwell's Equations, geometrical optics; electromagnetic radiation; physical optics; 	0-3 units

introduction to special relativity; quantum physics; and the physics of atoms, nuclei, and the solid state. <u>And</u>	0-3 units
<ul style="list-style-type: none"> • A course that articulates with [CSUF MATH 81], Applied Analysis - An introduction to ordinary linear differential equations; solutions by power series and Laplace transforms; solution of systems of equations and Fourier series. 	
(2) If not taken as part of the statewide pattern complete <u>one</u> of the following:	0-3 units
<ul style="list-style-type: none"> • A course that articulates with [CSUF ECON 40], Principles of Microeconomics. <u>Or</u> • A course that articulates with [CSUF ECON 50], Principles of Macroeconomics. 	
(3) If not taken as part of the statewide pattern complete <u>one</u> of the following:	0-3 units
<ul style="list-style-type: none"> • A course that articulates with [CSUF PHIL 1], Introduction to Philosophy. <u>Or</u> • A course that articulates with [CSUF PHIL 10], Self, Religion, and Society- Conceptions of human nature; nature and varieties of religion; personal and social implications and values of religion. 	
If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Electrical Engineering, Electrical and Electronic Engineering LOWER-DIVISION TRANSFER PATTERN CSU Fullerton Campus-Specific Pattern

In addition to the statewide pattern, the following is the CSU Fullerton campus-specific pattern:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete <u>all</u> of the following:	
<ul style="list-style-type: none"> • A course that articulates with CSU GE Breadth AREA A3, Critical Thinking. <u>And</u> • A course that articulates with [CSUF MATH 250B], Intro Linear Algebra & Differential Equations. <u>And</u> • A course that articulates with [CSUF PHYS 227 & 227L], Physics (Calculus-based). <u>And</u> • A course that articulates with [CSUF CHEM 115], Intro General Chemistry. <u>And</u> • A course that articulates with CSU GE Breadth AREA B2, Life Science. 	0-3 units 0-4 units 0-4 units 0-5 units 0-3 units
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Electrical Engineering, Electrical and Electronic Engineering LOWER-DIVISION TRANSFER PATTERN Humboldt State University Campus-Specific Pattern

This campus does not have a major, concentration, or option in Electrical Engineering, Electrical, and Electronic Engineering.

Electrical Engineering, Electrical and Electronic Engineering LOWER-DIVISION TRANSFER PATTERN CSU Long Beach Campus-Specific Pattern

In addition to the statewide pattern, the following is the CSU Long Beach campus-specific pattern for the B.S. in Electrical Engineering:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern, complete <u>all</u> of the following:	
<ul style="list-style-type: none"> • An Introduction to Differentials Equations course. <u>And</u> 	4 units

<ul style="list-style-type: none"> • A course that articulates with Critical Thinking. <i>This requirement should be used to complete CSU GE Breadth AREA A3. A minimum grade of C is necessary to meet this requirement.</i> 	3 units
(2) If not taken as part of the statewide pattern, complete <u>one</u> of the following: <ul style="list-style-type: none"> • A course that articulates with [CSULB PHYS 254], Applied Modern Physics. <u>Or</u> • A course that articulates with [CSULB PHYS 254+255], Applied Modern Physics + Laboratory on Modern Physics. 	1 unit
(3) If not taken as part of the statewide pattern, complete <u>one</u> of the following: <ul style="list-style-type: none"> • A course that articulates with [CSULB EE 211L], Electric Circuits Laboratory. <u>Or</u> • A course that articulates with [CSULB EE 211 + 211L], Electric and Electronic Circuits and Electric Circuits Laboratory. 	1 units
(4) If not taken as part of the statewide pattern, complete at least <u>one</u> of the following: <ul style="list-style-type: none"> • A course that articulates with a GE course in CSU GE Breadth AREA B2 and B3 - Life Science with laboratory. <u>Or</u> • A course that articulates with a GE course in CSU GE Breadth AREA E - Lifelong Understanding and Self-development. 	3 units
(5) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Electrical Engineering, Electrical and Electronic Engineering LOWER-DIVISION TRANSFER PATTERN CSU Los Angeles Campus-Specific Pattern

In addition to the statewide pattern, the following is the CSU Los Angeles campus-specific pattern:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete <u>all</u> of the following: <ul style="list-style-type: none"> • A course that articulates with [CAN MATH 24], Introduction to Differential Equations. <u>And</u> • A course that articulates with [CAN PHYS 14], Physics (Calculus-based). <u>And</u> • A course that articulates with [CAN CHEM 2], General Chemistry with Lab for Science Majors. <u>And</u> • A course that articulates with [CAN ENGR 8], Statics. <u>And</u> • A course that articulates with A second semester of expository writing that emphasizes exposition, research, and critical thinking, typically called “Writing and Critical Thinking” (as opposed to “Literature and Composition”). <u>And</u> • A course that articulates with Lifelong Understanding and Self-Development, CSU GE Breadth AREA E. <u>And</u> • A course that articulates with CSU GE Breadth Area C, Arts, Literature, Philosophy, and Foreign Languages. 	0-3 units 0-3 units 0-3 units 0-3 units 0-3 units 0-3 units 0-3 units
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Electrical Engineering, Electrical and Electronic Engineering LOWER-DIVISION TRANSFER PATTERN California Maritime Academy Campus-Specific Pattern

This campus does not have a major, concentration, or option in Electrical Engineering, Electrical, and Electronic Engineering.

Electrical Engineering, Electrical and Electronic Engineering LOWER-DIVISION TRANSFER PATTERN CSU Monterey Bay Campus-Specific Pattern

This campus does not have a major, concentration, or option in Electrical Engineering, Electrical, and Electronic Engineering.

Electrical Engineering, Electrical and Electronic Engineering LOWER-DIVISION TRANSFER PATTERN CSU Northridge Campus-Specific Pattern

In addition to the statewide pattern, the following is the CSU Northridge campus-specific pattern:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete <u>all</u> of the following: <ul style="list-style-type: none"> • A course that articulates with [CSUN MATH 280], Applied Differential Equations. <u>And</u> • A course that articulates with [CSUN CHEM 101 & 101L], General Chemistry I and Lab. <u>And</u> • A course that articulates with [CSUN CE 240], Engineering Statics. <u>And</u> • A course that articulates with [CSUN ECE 240 & 240L], Electrical Engineering Fundamentals, and Lab. <u>And</u> • A course that articulates with [CSUN MSE 227], Engineering Materials. <p><i>A minimum grade of C is required in courses used to meet these requirements.</i></p>	<p style="text-align: center;">0-3 units</p> <p style="text-align: center;">0-5 units</p> <p style="text-align: center;">0-3 units</p> <p style="text-align: center;">0-1 units</p> <p style="text-align: center;">0-3 units</p>
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Electrical Engineering, Electrical and Electronic Engineering LOWER-DIVISION TRANSFER PATTERN Cal Poly Pomona Campus-Specific Pattern

In addition to the statewide pattern, the following is the Cal Poly Pomona campus-specific pattern for the B.S. in Electrical Engineering:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete <u>all</u> of the following: <ul style="list-style-type: none"> • A third course that articulates with CSU GE Breadth Area C, Arts and Humanities. <u>And</u> • A course in Sociology, Anthropology, or Ethnic Studies that articulates with CSU GE Breadth Area D, Social Sciences. <u>And</u> • A course that articulates with CSU GE Breadth Area E, Lifelong Learning and Self-Development. <u>And</u> • A course that articulates with [CPP MAT 224], Elementary Linear Algebra and Differential Equations - A course that covers separable and linear ordinary differential equations; numerical and analytical solutions, vectors in n-space, matrices, linear transformations, eigenvalues, eigenvectors, diagonalization; applications to the study of systems of linear differential equations. <u>And</u> • A course that articulates with [CPP CHM 121], General Chemistry - A course that covers atomic theory of structure and bonding, chemical equations, gas laws, oxidation-reduction, electrochemistry, states of matter, equilibrium, acids and bases, thermodynamics and reaction kinetics and their applications to chemistry, physics, and engineering science. <u>And</u> • A course that articulates with [CPP CHM 121L], General Chemistry Laboratory - A lab course that conducts experiments in basic quantitative analysis techniques, gas measurement, acid-base, pH, and redox titrations, electrochemistry, kinetics, thermodynamics, and ionic equilibria and qualitative analysis procedures. <u>And</u> • A course that articulates with [CPP BIO 110], Life Science - A course that covers the basic concepts in the study of living systems, including human beings; uses the study of biology to illustrate approaches of science in understanding the universe; with the role of science in modern society and the impact of human civilization on other organisms considered. 	<p style="text-align: center;">0-3 units</p> <p style="text-align: center;">0-3 units</p> <p style="text-align: center;">0-3 units</p> <p style="text-align: center;">0-3 units</p> <p style="text-align: center;">0-3 units</p> <p style="text-align: center;">0-1 units</p> <p style="text-align: center;">0-3 units</p>

(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
CSU Sacramento Campus-Specific Pattern**

In addition to the statewide pattern, the following is the CSU Sacramento campus-specific pattern:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete <u>all</u> of the following: <ul style="list-style-type: none"> • A course that articulates with [CSUS CHEM 1A], General Chemistry. <u>And</u> • A course that articulates with [CSUS MATH 45], Differential Equations. <u>And</u> • A course that articulates with CSU GE Breadth AREA B2, Life Science. <u>And</u> • A course that articulates with CSU GE Breadth AREA C, Arts, Literature, Philosophy, and Foreign Language. 	0-5 units 0-3 units 0-3 units 0-3 units
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
CSU San Bernardino Campus-Specific Pattern**

This campus does not have a major, concentration, or option in Electrical Engineering, Electrical, and Electronic Engineering.

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
San Diego State University Campus-Specific Pattern**

In addition to the statewide pattern, the following is the San Diego State University campus-specific pattern:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern, complete <u>all</u> of the following: <ul style="list-style-type: none"> • A course that articulates with CSU GE Breadth AREA A3, Critical Thinking. <u>And</u> • A course that articulates with CSU GE Breadth AREA B2, Life Science. <u>And</u> • A course that articulates with CSU GE Breadth AREA C2, Humanities (Literature, Philosophy, Foreign Language). <u>And</u> • A course that articulates with [SDSU MATH 254], Introduction to Linear Algebra - Matrix algebra, Gaussian elimination, determinants, vector spaces, linear transformations, orthogonality, eigenvalues, and eigenvectors. <u>And</u> • A course that articulates with [SDSU ENGR 280], Methods of Analysis - Selected topics from ordinary differential equations, the Laplace transform, Fourier series, and linear algebra, with engineering applications. <u>And</u> • A course that articulates with [SDSU PHYS 195L], Principles of Physics Laboratory - Experiments in mechanics, wave motion, resonance phenomena using precision air tracks. <u>And</u> • A course that articulates with [SDSU PHYS 196L], Principles of Physics Laboratory - Experiments in DC circuits, AC circuits, electrical resonance, oscilloscope measurement techniques, and electric and magnetic fields. <u>And</u> • A course that articulates with [SDSU COMPE 270], Digital Systems - A course that covers modeling, analysis and design of digital systems, primarily at the Logic 	0-3 units 0-3 units 0-3 units 0-3 units 0-3 units 0-1 units 0-1 units 0-3 units

Design level. Combinational and sequential networks covered. <u>And</u> <ul style="list-style-type: none"> • A course that articulates with [SDSU COMPE 271], Computer Organization - A course that covers organization and operation of computer hardware and software; operating system shell and services; program design and development; input-output programming; multi-module and mixed language programming; assembler and C language. 	0-3 units
(2) Students must complete 60 (but not more than 70) transferable semester units. Coursework not taken at the community college must be completed at SDSU.	

Electrical Engineering, Electrical and Electronic Engineering LOWER-DIVISION TRANSFER PATTERN San Francisco State University Campus-Specific Pattern

In addition to the statewide pattern, the following is the San Francisco State University campus-specific pattern:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern, complete <u>all</u> of the following: <ul style="list-style-type: none"> • A course that articulates with [SFSU MATH 245], Elementary Differential Equations and Linear Algebra. <u>And</u> • Coursework that articulates with [SFSU PHYS 240 and 242], General Physics with Calculus III with laboratory. <u>And</u> • A course that articulates with [SFSU CHEM 115], General Chemistry I: Essential Concepts of Chemistry. <u>And</u> • A course that articulates with [SFSU ENGR 100], Introduction to Engineering – A course that describes the major engineering fields and their subfields; day to day activities of engineers; engineering professionalism, ethics, communication skills, lifelong learning and career planning. <u>And</u> • A course that articulates with [SFSU ENGR 106], Introduction to Engineering Lab – A project based laboratory that covers basic measuring tools; MatLab, spreadsheet, and word processing software; recording, importing, and plotting various data to incorporate into engineering reports; and developing hands-on experience with basic software tools. <u>And</u> • A course that articulates with [SFSU ENGR 206], Circuits and Instrumentation Lab. <u>And</u> • A course that articulates with [SFSU ENGR 290], MATLAB or PSpice. 	0-3 units 0-4 units 0-5 units 0-1 units 0-1 units 0-1 units 0-1 units
(2) If not taken as part of the statewide pattern complete at least <u>one</u> of the following: <ul style="list-style-type: none"> • A course that articulates with [SFSU ENGR 201], Dynamics. <u>Or</u> • A course that articulates with [SFSU ENGR 203], Materials of Electrical and Electronics Engineering. <u>Or</u> • A course that articulates with [SFSU ENGR 204], Engineering Mechanics. <u>Or</u> • A course that articulates with a course that covers topics in Thermodynamics. 	0-3 units
(3) When possible, satisfy CSU GE Breadth or IGETC Areas by completing: <ul style="list-style-type: none"> • A course that articulates with [SFSU ENG 114], College Composition, 1st semester – Training in expository- argumentative composition, emphasizing work on clear and effective sentences and the organization and development of paragraph and essay. <u>And</u> • A course that articulates with [SFSU ENG 214], College Composition and Literature, 2nd semester - Expository-argumentative composition and critical reading skills through the study of literature; special attention to logic, style, and rhetoric. <i>A minimum grade of C is necessary in courses used to meet these requirements.</i>	
(4) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
San José State University Campus-Specific Pattern**

In addition to the statewide pattern, the following is the San José State University campus-specific pattern for the BS in Electrical Engineering:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern, complete courses from the following to bring total up to 60, and not more than 70 transferable semester units: <ul style="list-style-type: none"> • A course that articulates with [SJSU ENGL 001B], Composition 2. <i>A minimum grade of C or higher is required in courses used to meet this requirement.</i> <u>And</u> • Physical Activity. <i>Two units taken in at least two different activities.</i> <u>And</u> • A course that articulates with [SJSU MATH 133A], Differential Equations (for content credit only). <u>And</u> • A course that articulates with [SJSU CHEM 001A], One semester of General Chemistry. <u>And</u> • A course that articulates with [SJSU PHYS 052], General Physics/Heat and Light. <u>And</u> • A course that articulates with [SJSU PHYS 053], General Physics/Atomics Physics. • A course that articulates with [SJSU EE 097], Introductory Electrical Engineering Laboratory. <u>And</u> • A course that articulates with [SJSU EE 098], Introduction to Circuit Analysis. <u>And</u> • A course that articulates with [SJSU ENGR 010], Introduction to Engineering. <u>And</u> • A course that articulates with [SJSU CMPE 046], Computer Engineering I. 	0-3 units 0-2 units 0-3 units 0-5 units 0-4 units 0-2 units 0-1 unit 0-3 units 0-3 units 0-3 units
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

**Electrical Engineering
LOWER-DIVISION TRANSFER PATTERN
Cal Poly San Luis Obispo Campus-Specific Pattern**

In addition to the statewide pattern, the following is the Cal Poly San Luis Obispo campus-specific pattern:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete <u>all</u> of the following: <ul style="list-style-type: none"> • A course that articulates with [SLO MATH 244], Linear Analysis I. <u>And</u> • A course that articulates with [SLO PHYS 211], Modern Physics I. <u>And</u> • A course that articulates with [SLO PHYS 133], General Physics III. <u>And</u> • A course that articulates with [SLO CHEM 124], General Chemistry for the Engineering Disciplines I. 	0-3 units 0-3 units 0-3 units 0-3 units
(2) If not taken as part of the statewide pattern complete <u>one</u> of the following: <ul style="list-style-type: none"> • A course that articulates with [SLO ME 211], Engineering Statics. <u>Or</u> • A course that articulates with [SLO MATE 210], Materials Engineering. 	0-2 units 0-2 units
(3) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
CSU San Marcos Campus-Specific Pattern**

This campus does not have a major, concentration, or option in Electrical Engineering, Electrical, and Electronic Engineering.

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
Sonoma State University Campus-Specific Pattern**

In addition to the statewide pattern, the following is the Sonoma State University campus-specific pattern:

Campus-Specific Pattern	Semester Unit Requirement
<p>(1) If not taken as part of the statewide pattern complete <u>all</u> of the following:</p> <ul style="list-style-type: none"> • A course that articulates with [SSU MATH 241], Introduction to Differential Equations and Linear Algebra - A course in vector and matrix algebra applied to the study of differential equations with topics including vectors and matrices, linear independence, spanning, bases, linear transformations, first order differential equations and linear systems, phase planes, geometric and numerical methods. <u>And</u> • A course that articulates with [SSU MATH 142E], Discrete Math. <u>And</u> • A course that articulates with [SSU ES 221], Electric Circuits Lab - Laboratory work on materials covered in an Electrical Circuits course emphasizing elementary design principles. <u>And</u> • A course that articulates with [SSU ES 230 & 231], Electronics I with Lab - A course that teaches theory and operation of diodes, bipolar junction transistors and MOSFET transistors; analog and digital electronic circuits; design and analysis of analog electronic circuits; modeling and simulation using spice/multisim software. 	<p>0-3 units</p> <p>0-3 units 0-1 units</p> <p>0-4 units</p>
<p>(2) If not taken as part of the statewide pattern complete <u>one</u> of the following:</p> <ul style="list-style-type: none"> • A course that articulates with [SSU ES 210], Digital Circuits and Logic design with Lab - A course that deals with analysis and design of digital logic, modules and systems such as gates, adders, multipliers, shift registers, RAMs, ROMs, PLAs, etc., and the corresponding laboratory work. <u>Or</u> • A course that articulates with [SSU ES 314], Advanced Programming, modeling and Simulation – A course that teaches advanced programming techniques and how to use those techniques for modeling and simulation of scientific and engineering systems and subsystems. 	<p>0-4 units</p>
<p>(3) If necessary, complete additional coursework to bring total to 60 transferable semester units.</p>	

**Electrical Engineering, Electrical and Electronic Engineering
LOWER-DIVISION TRANSFER PATTERN
CSU Stanislaus Campus-Specific Pattern**

This campus does not have a major, concentration, or option in Electrical Engineering, Electrical, and Electronic Engineering.