

## Computer Science

### 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 Computer Science 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) to (6).

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><b>(1) Complete all of the following lower-division general education requirements:</b></p> <ul style="list-style-type: none"> <li>• <b>Three courses that articulate to satisfy CSU GE Breadth AREA A.</b> <u>And</u></li> <li>• <b>Three courses that articulates to satisfy, Arts and Humanities CSU GE Breadth AREA C.</b></li> <li>• <b>One course that articulates with CSU GE Breadth AREA D, Social, Political, and Economic Institutions and Behavior, Historical Background that along with the United States History, Constitution, American Ideals requirement (2) below to satisfies the area.</b></li> </ul> <p><i>A minimum grade of C is required in courses used to satisfy CSU GE Breadth AREA A.</i></p>	<b>21 units</b>
<p><b>(2) Complete the graduation requirements in United States History, Constitution, and American Ideals.</b></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>	<b>0-6 units</b>
<p><b>(3) Complete the Single Variable Calculus Sequence [CAN MATH SEQ B].</b></p> <p><i>A minimum grade of C is required in courses used to satisfy CSU GE Breadth AREA B4. One of these courses is used to complete the CSU GE Breadth AREA B4 requirement.</i></p>	<b>8 units</b>
<p><b>(4) Complete <u>all</u> of the following:</b></p> <ul style="list-style-type: none"> <li>• <b>A course that articulates with Physics – Calculus Based I [CAN PHYS 8].</b> <u>And</u></li> <li>• <b>A course that articulates with Physics – Calculus Based II [CAN PHYS 12].</b></li> </ul> <p><i>One of these requirements may be used to satisfy CSU GE Breadth AREA B1.</i></p>	<b>8 units</b>
<p><b>(5) Complete a Life Science course for Science Majors with lab.</b></p>	<b>4 units</b>

<i>One of these requirements may be used to satisfy CSU GE Breadth AREA B2 and B3.</i>	
<b>(6) Complete the Fundamental Computer Science Concepts Sequence.</b>  A sequence of courses that is compliant with the standards of the Association for Computing Machinery (ACM). The sequence will include approximately 6 units of study in programming and 6 units of coursework distributed equally between discrete mathematics and machine organization.	<b>12 units</b>
<b>Total Semester Units Required for Statewide LDTP Pattern</b>	<b>59 units*</b>

\*This is the minimum number of units necessary to complete the LDTP requirements. Additional units may be necessary to meet course content requirements.

**Computer Science  
LOWER-DIVISION TRANSFER PATTERN  
CSU Bakersfield Campus-Specific Pattern**

In addition to the statewide pattern, the following is the CSU Bakersfield campus-specific pattern in Computer Science:

Campus-Specific Pattern	Semester Unit Requirement
<b>(1) If not taken as part of the statewide pattern complete <u>all</u> of the following:</b> <ul style="list-style-type: none"> <li>• <b>A course that articulates with [CSUB CMPS 150], Introduction to Unix - Basic</b> Unix commands and programming utilities will be introduced. <u>And</u></li> <li>• <b>A course that articulates with [CSUB CMPS 221], Programming Fundamentals -</b> Introduces the fundamentals of procedural programming. <u>And</u></li> <li>• <b>A course that articulates with [CSUB CMPS 222], Object-Oriented Programming</b> - Builds on foundation provided by CMPS 221 to introduce the concepts of object-oriented programming. <u>And</u></li> <li>• <b>A course that articulates with [CSUB CMPS 223], Data Structures and Algorithms</b> - Builds on the foundation provide by the CMPS 221-222 sequence to introduce the fundamental concepts of data structures and algorithms. <u>And</u></li> <li>• <b>A course that articulates with [CSUB CMPS 295], Discrete Structures - Discrete</b> structures and applications in computer science.</li> </ul>	<b>0-1 units</b>  <b>0-4 units</b>  <b>0-4 units</b>  <b>0-4 units</b>  <b>0-4 units</b>
<b>(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.</b>	

**Computer Science  
LOWER-DIVISION TRANSFER PATTERN  
CSU Channel Islands Campus-Specific Pattern**

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

Campus-Specific Pattern	Semester Unit Requirement
<b>(1) If not taken as part of the statewide pattern, complete <u>all</u> of the following:</b> <ul style="list-style-type: none"> <li>• <b>Coursework that articulates with [CSUCI COMP 232], Programming Languages.</b> <u>And</u></li> <li>• <b>Coursework that articulates with [CSUCI COMP 262], Computer Organization and Architecture.</b> <u>And</u></li> <li>• <b>Coursework that articulates with [CSUCI MATH 230], Logic and Mathematical Reasoning.</b> <u>And</u></li> <li>• <b>Coursework that articulates with [CSUCI MATH 240], Linear Algebra.</b></li> </ul>	<b>0-3 units</b>  <b>0-3 units</b>  <b>0-3 units</b>  <b>0-3 units</b>
<b>(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.</b>	

**Computer Science  
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
(1) If not taken as part of the statewide pattern complete the following: <ul style="list-style-type: none"> <li>• A course that articulates with [CSUC MATH 217], Discrete Math.</li> </ul>	0-3 units
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

**Computer Science  
LOWER-DIVISION TRANSFER PATTERN  
CSU Dominguez Hills Campus-Specific Pattern**

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

Campus-Specific Pattern
(1) If necessary, complete additional coursework to bring total to 60 transferable semester units.

**Computer Science  
LOWER-DIVISION TRANSFER PATTERN  
CSU East Bay Campus-Specific Pattern**

In addition to the statewide pattern, the following is the CSU East Bay campus-specific pattern for the B.S. in Computer Science:

Campus-Specific Pattern	Semester Unit Requirement
(3) If not taken as part of the statewide pattern complete the following: <ul style="list-style-type: none"> <li>• A course that articulates with [CSUEB MATH 2101], Elements of Linear Algebra.</li> </ul>	0-3 units
(4) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

**Computer Science  
LOWER-DIVISION TRANSFER PATTERN  
CSU Fresno Campus-Specific Pattern**

In addition to the statewide pattern, the following is the CSU East Bay campus-specific pattern for the B.S. in Computer Science:

Campus-Specific Pattern
(1) If necessary, complete additional coursework to bring total to 60 transferable semester units.

**Computer Science  
LOWER-DIVISION TRANSFER PATTERN  
CSU Fullerton Campus-Specific Pattern**

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

<b>Campus-Specific Pattern</b>
<b>(1) If necessary, complete additional coursework to bring total to 60 transferable semester units.</b>

**Computer Science  
LOWER-DIVISION TRANSFER PATTERN  
Humboldt State University Campus-Specific Pattern**

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

<b>Campus-Specific Pattern</b>
<b>(1) If necessary, complete additional coursework to bring total to 60 transferable semester units.</b>

**Computer Science  
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 Computer Science:

<b>Campus-Specific Pattern</b>
<b>(1) If necessary complete additional coursework to bring total to 60 transferable semester units</b>
<i>Recommended Course:</i> <i>A course that articulates with [CSULB CECS 282], C++ for Java Programmers.</i>

**Computer Science  
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:

<b>Campus-Specific Pattern</b>
<b>(1) If necessary, complete additional coursework to bring total to 60 transferable semester units.</b>

**Computer Science  
LOWER-DIVISION TRANSFER PATTERN  
California Maritime Academy Campus-Specific Pattern**

This campus does not have a major, concentration, or option in Computer Science.

**Computer Science  
LOWER-DIVISION TRANSFER PATTERN  
CSU Monterey Bay Campus-Specific Pattern**

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

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"> <li>• A course that articulates with [CSUMB CST 231], Problem Solving using C++ (or Java). <u>And</u></li> <li>• A course that articulates with [CSUMB CST 234], Introduction to Operating Systems. <u>And</u></li> <li>• A course that articulates with [CSUMB CST 237], Introduction to Computer Architecture. <u>And</u></li> <li>• A course that articulates with [CSUMB MATH 170], Discrete Mathematics.</li> </ul>	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.	

**Computer Science  
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
(1) If necessary, complete additional coursework to bring total to 60 transferable semester units.

**Computer Science  
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:

Campus-Specific Pattern
(1) If necessary, complete additional coursework to bring total to 60 transferable semester units.

**Computer Science  
LOWER-DIVISION TRANSFER PATTERN  
CSU Sacramento Campus-Specific Pattern**

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

Campus-Specific Pattern
(1) If necessary, complete additional coursework to bring total to 60 transferable semester units.



**Computer Science  
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 B.S. in Computer Science:

Campus-Specific Pattern	Semester Unit Requirement
<b>(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:</b> <ul style="list-style-type: none"> <li>• A course that articulates with [SJSU MATH 032], <b>Calculus III</b>. <u>And</u></li> <li>• A course that articulates with [SJSU CS 072], <b>Unix and Unix Utilities</b>. <u>And</u></li> <li>• A course that articulates with [SJSU ENGL 001B], <b>Composition 2</b>, or an equivalent 2<sup>nd</sup> Semester English Composition course approved for IGETC Area 1B. <i>A minimum grade of C or higher is required in courses used to meet this requirement.</i> <u>And</u></li> <li>• <b>Physical Activity</b>. <i>Two units taken in at least two different activities.</i></li> </ul>	<b>0-3 units</b> <b>0-3 units</b> <b>0-3 units</b>  <b>0-2 units</b>
<b>(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.</b>	

**Computer Science  
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
<b>(1) If necessary, complete additional coursework to bring total to 60 transferable semester units.</b>

**Computer Science  
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
<b>(1) If not taken as part of the statewide pattern complete the following:</b> <ul style="list-style-type: none"> <li>• A course that articulates with the introductory use of Unix as a programming environment, including communication with a Unix host, shells and shell commands, files and directories, jobs and processes, scripting, and programming utilities.</li> </ul>	<b>0-1 units</b>
<b>(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.</b>	

**Computer Science**  
**LOWER-DIVISION TRANSFER PATTERN**  
**CSU Stanislaus Campus-Specific Pattern**

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

<b>Campus-Specific Pattern</b>
<b>(1) If necessary, complete additional coursework to bring total to 60 transferable semester units.</b>