CSU The California State University

December 4, 2008

Biology and Microbiology

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 Biology at any CSU campus offering the major includes:

- Completion of most lower-division general education requirements: AREAS A, C, and D of the CSU General Education Breadth pattern;
- Completion of the CSU graduation requirements in United States History, Constitution and American Ideals; and
- Completion of 15 additional semester units as specified in (3) through (5) below. Courses used in these requirements will complete CSU GE Breadth AREA B.

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
(1) Complete lower-division general education requirements. Obtain a certification of completion of CSU GE Breadth or IGETC by the California Community College before transferring to a CSU campus. While completing general education, follow the course pattern stated below. If necessary, a course that completes CSU GE Breadth AREA E will be specified in the LDTP Campus-Specific Patterns. *A minimum grade of C is required in courses used to meet CSU GE Breadth AREAS A and B4.* *A minimum grade of C is required in each course used for IGETC.*	**36 units for CSU GE Breadth** or **35 units for IGETC**
(2) Complete the graduation requirements in United States History, Constitution, and American Ideals. 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. *Courses used to meet this requirement may be used to complete CSU GE Breadth AREA D.*	**0 units**
(3) Complete the General Biology Sequence [CAN BIOL SEQ A]**.**	**5-10 units**
(4) Complete the General Chemistry for Science Majors Sequence, with Lab [CAN CHEM SEQ A]**.**	**5-10 units**
(5) Complete at least one of the following: • **Single Variable Calculus I,** [CAN MATH 18]**.** Or	**0-4 units**

• **Calculus with Life Science Applications,** [CAN MATH 30]**.**	
Total Semester Units Required for Statewide LDTP Pattern	**45-59 units**

Biology and Microbiology
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 Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CSUB BIOL 201]**, Introductory Biology - Cells -** Cell structure and function with emphasis on molecular aspects. And • **A course that articulates with** [CSUB BIOL 202]**, Introductory Biology - Animals -** Function, form, and diversity of animals. And • **A course that articulates with** [CSUB BIOL 203]**, Introductory Biology - Plants -** Plant structure, function, and diversity with emphasis placed on ecological and evolutionary aspects of seed plants. And • **A course that articulates with** [CSUB CHEM 212]**, Principles of General Chemistry II -** A continuation of CHEM 211. And • **A course that articulates with** [CSUB MATH 191]**, Pre-calculus I: College Algebra -** The algebraic and graphical analysis of polynomial, rational, logarithmic, and exponential functions and their applications.	**0-4 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
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 for the B.S. in Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete at least one of the following: • **Coursework that articulates with Organic Chemistry.** Or • **Coursework that articulates with** [CSUCI PHYS 100]**, Introduction to Physics I.**	**0-3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

In addition to the statewide pattern, the following is the CSU Channel Islands campus-specific pattern for the B.A. in Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete at least one of the following: • **Coursework that articulates with Organic Chemistry.** Or • **Coursework in the CSU GE Breadth AREA E.**	**0-3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
LOWER-DIVISION TRANSFER PATTERN
CSU Chico Campus-Specific Pattern

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

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CSUC PHYS 202A]**, General Physics I.** And • **A course that articulates with** [CSUC PHYS 202B]**, General Physics II.** And • **A course that articulates with** [CSUC BIOL 153]**, Principles of Physiology and Development.** And • **A course that articulates with** [CSUC ENVL 105]**, Environmental Literacy.** *This course will be used to satisfy CSU GE Breadth AREA E.*	**0-4 units** **0-4 units** **0-4 units** **0-3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

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

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CSUC PHYS 202A]**, Physics (Algebra/Trig based).** And • **A course that articulates with** [CSUC PHYS 202B]**, Physics (Algebra/Trig based).** And • **A course that articulates with** [CSUC BIOL 153]**, Principles of Physiology and Development.** And • **A course that articulates with** [CSUC ENVL 105]**, Environmental Literacy.** *This course will be used to satisfy CSU GE Breadth AREA E.*	**0-4 units** **0-4 units** **0-4 units** **0-3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
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 in Biology and Microbiology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete at least one of the following: • **Coursework that articulates with** [CSUDH PHY 120 & 122]**, Elements of Physics I & II (Algebra/Trig based).** Or • **Coursework that articulates with** [CSUDH PHY 130 & 132]**, General Physics I & II (Calculus based).**	**0-10 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
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 B.A. and B.S. in Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **Courses that articulate with** [CSUEB PHYS 2701, 2702, and 2703]**, Introductory Physics sequence.**	**0-9 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

In addition to the statewide pattern, the following is the CSU East Bay campus-specific pattern for B.A. and B.S. in Biology with an option in Ecology and Conservation Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete one of the following: • **Courses that articulate with** [CSUEB PHYS 1700, and PHYS 1780]**, Elementary Physics Sequence and Lab.** Or • **One course that articulates from** [CSUEB PHYS 2701, 2702, or 2703]**, Introductory Physics sequence.**	**0-9 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
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 Ecology, Evolutionary, and Organismal option in Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CSUF CHEM 8]**, one semester of Organic Chemistry lecture with no lab.** And • **A course that articulates with** [CSUF PSYCH 42]**, Introduction to Statistics in Psychology -** Basic statistical methods for analysis of data; parametric tests of significance; linear regression and correlation; analysis of variance; introduction to non-parametric techniques. And • **A course that articulates with** [CSUF PHYS 2A]**, Physics (Algebra/Trig based) -** Topics and concepts in Newtonian mechanics of point particles and rigid bodies, energy, properties of fluids, heat and thermodynamics, waves and sound.	**0-3 units** **0-3 units** **0-4 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

In addition to the statewide pattern, the following is the CSU Fresno campus-specific pattern for the Molecular, Cellular, and Developmental or Physiology and Anatomy options in Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete the following: • **A course that articulates with** [CSUF PHYS 2A and B]**, General Physics -** Topics	**0-8 units**

and concepts in Newtonian mechanics of point particles and rigid bodies, energy, properties of fluids, heat and thermodynamics, waves and sound. Topics and concepts in light, electricity, magnetism, atomic structure, relativity, quantum nature of light and matter, nuclear structure and radiation. And • **A course that articulates with** [CSUF PSYCH 42]**, Introduction to Statistics in Psychology -** Basic statistical methods for analysis of data; parametric tests of significance; linear regression and correlation; analysis of variance; introduction to non-parametric techniques.	**0-4 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
LOWER-DIVISION TRANSFER PATTERN
CSU Fullerton Campus-Specific Pattern

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

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CSUF PHYS 211 and 211L]**, Elementary Physics with Lab -** A course that introduces mechanics and thermodynamics**.** And • **A course that articulates with** [CSUF PHYS 212 and 212 L]**, Elementary Physics with Lab -** A course that introduces electricity and magnetism, wave motion and optics.	**0-4 units** **0-4 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
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 in Biology with an emphasis in Cellular/Molecular Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with CSU GE Breadth AREA E, Lifelong Understanding and Self –Development.** And • **A course that articulates with** [HSU BIOM 109]**, Introductory Biometrics.** And • **A course that articulates with** [HSU CHEM 109]**, General Chemistry.** And • **A course that articulates with** [HSU CHEM 110]**, General Chemistry.** And • **A course that articulates with** [HSU BIOL 105]**, Principles of Biology.** And • **A course that articulates with** [HSU BOT 105]**, General Botany.** And • **A course that articulates with** [HSU ZOOL 110]**, General Zoology.** And • **A course that articulates with** [HSU PHYX 106]**, College Physics: Mechanics & Heat. And** • **A course that articulates with** [HSU PHYX 107]**, College Physics: Electromagnetism & Modern Physics.**	**3 units** **0-4 units** **0-5 units** **0-5 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units**
(2) If not taken as part of the statewide pattern complete one of the following: • **Complete all of the following:** o **A course that articulates with** [HSU MATH 109]**, Calculus I.** And o **A course that articulates with** [HSU MATH 110]**, Calculus II.** Or • **A course that articulates with** [HSU MATH 105]**, Calculus for the Biological**	**0-8 units**

Sciences & Natural Resources.	
(3) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

In addition to the statewide pattern, the following is the Humboldt State University campus-specific pattern in Biology with an emphasis in Ecology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with CSU GE Breadth AREA E, Lifelong Understanding and Self-Development.** And • **A course that articulates with** [HSU BIOM 109]**, Introductory Biometrics.** And • **A course that articulates with** [HSU CHEM 109]**, General Chemistry.** And • **A course that articulates with** [HSU BIOL 105]**, Principles of Biology.** And • **A course that articulates with** [HSU BOT 105]**, General Botany.** And • **A course that articulates with** [HSU ZOOL 110]**, General Zoology.** And • **A course that articulates with** [HSU PHYX 106]**, College Physics: Mechanics & Heat.** • **A course that articulates to** [HSU PHYX 118]**, College Physics: Biological Applications.**	**3 units** **0-4 units** **0-5 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units**
(2) If not taken as part of the statewide pattern complete one of the following: • **Complete all of the following:** o **A course that articulates with** [HSU MATH 109]**, Calculus I.** And o **A course that articulates with** [HSU MATH 110]**, Calculus II.** Or • **A course that articulates with** [HSU MATH 105]**, Calculus for the Biological Sciences & Natural Resources.**	**0-8 units**
(3) If not taken as part of the statewide pattern complete one of the following: • **A course that articulates to** [HSU GEOL 109]**, General Geology.** Or • **A course that articulates to** [HSU OCN 109]**, General Oceanography.** Or • **A course that articulates to** [HSU SOIL 260]**, Introduction to Soil Science.** Or • **A course that articulates to** [HSU GEOG 106]**, Physical Geography.**	**0-4 units**
(4) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

In addition to the statewide pattern, the following is the Humboldt State University campus-specific pattern in Biology with an emphasis in Environmental Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with CSU GE Breadth AREA E, Lifelong Understanding and Self –Development.** And • **A course that articulates with** [HSU BIOM 109]**, Introductory Biometrics.** And • **A course that articulates with** [HSU CHEM 109]**, General Chemistry.** And • **A course that articulates with** [HSU CHEM 110]**, General Chemistry.** And • **A course that articulates with** [HSU BIOL 105]**, Principles of Biology.** And • **A course that articulates with** [HSU BOT 105]**, General Botany.** And • **A course that articulates with** [HSU ZOOL 110]**, General Zoology.** And • **A course that articulates with** [HSU PHYX 106]**, College Physics: Mechanics & Heat.** And • **A course that articulates to** [HSU PHYX 118]**, College Physics: Biological Applications.**	**3 units** **0-4 units** **0-5 units** **0-5 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units**
(2) If not taken as part of the statewide pattern complete one of the following: • **Complete all of the following:** o **A course that articulates with** [HSU MATH 109]**, Calculus I.** And o **A course that articulates with** [HSU MATH 110]**, Calculus II.** Or • **A course that articulates with** [HSU MATH 105]**, Calculus for the Biological Sciences & Natural Resources.**	**0-8 units**

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

In addition to the statewide pattern, the following is the Humboldt State University campus-specific pattern in General Biology,

(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with CSU GE Breadth AREA E, Lifelong Understanding and Self –Development.** And • **A course that articulates with** [HSU BIOM 109]**, Introductory Biometrics.** And • **A course that articulates with** [HSU CHEM 109]**, General Chemistry.** And • **A course that articulates with** [HSU BIOL 105]**, Principles of Biology.** And • **A course that articulates with** [HSU BOT 105]**, General Botany.** And • **A course that articulates with** [HSU ZOOL 110]**, General Zoology.** And • **A course that articulates with** [HSU PHYX 106]**, College Physics: Mechanics & Heat.** And • **A course that articulates to** [HSU PHYX 118]**, College Physics: Biological Applications.**	**3 units** **0-4 units** **0-5 units** **0-5 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units**
(2) If not taken as part of the statewide pattern complete one of the following: • **Complete all of the following:** o **A course that articulates with** [HSU MATH 109]**, Calculus I.** And o **A course that articulates with** [HSU MATH 110]**, Calculus II.** Or • **A course that articulates with** [HSU MATH 105]**, Calculus for the Biological Sciences & Natural Resources.**	**0-8 units**
(3) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

In addition to the statewide pattern, the following is the Humboldt State University campus-specific pattern in Biology with an emphasis in Marine Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with CSU GE Breadth AREA E, Lifelong Understanding and Self –Development.** And • **A course that articulates with** [HSU BIOM 109]**, Introductory Biometrics.** And • **A course that articulates with** [HSU CHEM 109]**, General Chemistry.** And • **A course that articulates with** [HSU CHEM 110]**, General Chemistry.** And • **A course that articulates with** [HSU BIOL 105]**, Principles of Biology.** And • **A course that articulates with** [HSU BOT 105]**, General Botany.** And • **A course that articulates with** [HSU ZOOL 110]**, General Zoology.** And • **A course that articulates with** [HSU PHYX 106]**, College Physics: Mechanics & Heat.** And • **A course that articulates to** [HSU OCN 109]**, General Oceanography.** • **A course that articulates to** [HSU PHYX 118]**, College Physics: Biological Applications.**	**3 units** **0-4 units** **0-5 units** **0-5 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units**
(2) If not taken as part of the statewide pattern complete one of the following: • **Complete all of the following:** o **A course that articulates with** [HSU MATH 109]**, Calculus I.** And o **A course that articulates with** [HSU MATH 110]**, Calculus II.** Or • **A course that articulates with** [HSU MATH 105]**, Calculus for the Biological Sciences & Natural Resources.**	**0-8 units**
(3) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

In addition to the statewide pattern, the following is the Humboldt State University campus-specific pattern in Biology with an emphasis in Microbiology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with CSU GE Breadth AREA E, Lifelong Understanding and Self –Development.** And • **A course that articulates with** [HSU BIOM 109]**, Introductory Biometrics.** And • **A course that articulates with** [HSU CHEM 109]**, General Chemistry.** And • **A course that articulates with** [HSU CHEM 110]**, General Chemistry.** And • **A course that articulates with** [HSU BIOL 105]**, Principles of Biology.** And • **A course that articulates with** [HSU BOT 105]**, General Botany.** And • **A course that articulates with** [HSU ZOOL 110]**, General Zoology.** And • **A course that articulates with** [HSU PHYX 106]**, College Physics: Mechanics & Heat.** And • **A course that articulates to** [HSU PHYX 118]**, College Physics: Biological Applications.**	**3 units** **0-4 units** **0-5 units** **0-5 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units**
(2) If not taken as part of the statewide pattern complete one of the following: • **Complete all of the following:** o **A course that articulates with** [HSU MATH 109]**, Calculus I.** And o **A course that articulates with** [HSU MATH 110]**, Calculus II.** Or • **A course that articulates with** [HSU MATH 105]**, Calculus for the Biological Sciences & Natural Resources.**	**0-8 units**
(3) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

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

(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with CSU GE Breadth AREA E, Lifelong Understanding and Self –Development.** And • **A course that articulates with** [HSU BIOM 109]**, Introductory Biometrics.** And • **A course that articulates with** [HSU CHEM 109]**, General Chemistry.** And • **A course that articulates with** [HSU BIOL 105]**, Principles of Biology.** And • **A course that articulates with** [HSU BOT 105]**, General Botany.** And • **A course that articulates with** [HSU ZOOL 110]**, General Zoology.** And • **A course that articulates with** [HSU PHYX 106]**, College Physics: Mechanics & Heat.** And • **A course that articulates to** [HSU PHYX 118]**, College Physics: Biological Applications.**	**3 units** **0-4 units** **0-5 units** **0-5 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units** **0-4 units**
(2) If not taken as part of the statewide pattern complete one of the following: • **Complete all of the following:** o **A course that articulates with** [HSU MATH 109]**, Calculus I.** And o **A course that articulates with** [HSU MATH 110]**, Calculus II.** Or • **A course that articulates with** [HSU MATH 105]**, Calculus for the Biological Sciences & Natural Resources.**	**0-8 units**
(3) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
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 Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern, complete all of the following: • **A course that articulates with CSU GE Breadth Area E -** Lifelong Understanding and Self-development. And • **Three additional units are allowed for the Biology, Chemistry, and Math courses taken in the statewide pattern.**	**3 units** **3 units**
(2) If not taken as part of the statewide pattern, complete one of the following: • **A course that articulates with** [CSULB MATH 123]**, Calculus II.** Or • **A course that articulates with** [CSULB MATH 119B]**, Survey of Calculus II.**	**3-5 units**
(3) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

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

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern, complete all of the following: • **A course that articulates with** [CSULB MICR 211]**, General Microbiology.** And • **A course that articulates with CSU GE Breadth Area E -** Lifelong Understanding and Self-development. And • **Four additional units are allowed for the Biology, Chemistry, and Math courses taken in the statewide pattern.**	**4-5 units** **3 units** **0-4 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
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 in Biology and Microbiology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CSULA PHYS 101, 102, & 103]**, Physics (Algebra/Trig based).** And • **A course that articulates with CSU GE Breadth AREA E, Lifelong Understand and Self –Development.** And • **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").**	**0-8 units** **3 units** **0-3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
LOWER-DIVISION TRANSFER PATTERN
California Maritime Academy Campus-Specific Pattern

This campus does not have a major, concentration, or option in Biology or Microbiology.

Biology and Microbiology
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 in Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete the following: • **A course that articulates with CSU GE Breadth AREA E, Lifelong Understanding and Self –Development.**	**3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units. *Recommended foreign language coursework:* • *Students transferring into Biology at CSUMB are encouraged to begin or complete their language study. (At CSUMB, one upper division requirement for all students is intermediate proficiency in a language). For students who begin but do not complete their language requirement prior to transferring, the following languages are offered at CSUMB: American Sign Language, Italian, Japanese, and Spanish. In addition, French can be completed at a nearby community college.*	

Biology and Microbiology
LOWER-DIVISION TRANSFER PATTERN
CSU Northridge Campus-Specific Pattern

In addition to the statewide pattern, the following is the CSU Northridge campus-specific pattern in Biology and Microbiology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CSUN PHYS 100A/AL]**, General Physics I and Lab. And** • **A course that articulates with** [CSUN PHYS 100B/BL]**, General Physics II and Lab.**	**0-4 units** **0-4 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
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 in Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CPP PHY 121/121L, PHY 122/122L and PHY 123/123L]**, Physics (Algebra/Trig based).** And • **A course that articulates with** [CPP STA 120]**, Statistics.**	**0-8 units** **0-3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

In addition to the statewide pattern, the following is the Cal Poly Pomona campus-specific pattern in Microbiology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete the following: • **Courses that articulate with** [CPP PHY 121/121L, PHY 122/122L and PHY 123/123L]**, Physics (Algebra/Trig based).**	**0-8 units**
(2) If not taken as part of the statewide pattern complete at least one of the following: • **A course that articulates with** [CPP PSY 201] **General Psychology.** Or • **A course that articulates with** [CPP PSY 210] **Mind, Brain, and Behavior: An Integrated View.** Or • **A course that articulates with** [CPP FN 203] **Health, Nutrition, and the Integrated Being.**	**0-3 units**
(3) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
LOWER-DIVISION TRANSFER PATTERN
CSU Sacramento Campus-Specific Pattern

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

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CSUS STAT 1], **Statistics.** And • **A course that articulates with CSU GE Breadth AREA E – Lifelong Understanding and Self –Development.**	**0-3 units** **3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

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

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CSUS PHYS 5A]**, Physics (Algebra/Trig based).** And • **A course that articulates with** [CSUS PHYS 5B]**, Physics (Algebra/Trig based).** And	**0-4 units** **0-4 units**

• **A course that articulates with CSU GE Breadth AREA E – Lifelong Understanding and Self –Development.**	**3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
LOWER-DIVISION TRANSFER PATTERN
CSU San Bernardino Campus-Specific Pattern

In addition to the statewide pattern, the following is the CSU San Bernardino campus-specific pattern in Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following:	
• **A course that articulates with** [CSUSB PHYS 121]**, Basic Concepts of Physics I -** First course of a three-course sequence surveying the basic concepts of physics, primarily for students entering fields relating to the biological sciences. This course will cover the basic principles of mechanics. And	**0-3 units**
• **A course that articulates with** [CSUSB PHYS 122]**, Basic Concepts of Physics II -** Continuation of PHYS 121. Topics include electricity, electric circuits, and magnetism. And	**0-3 units**
• **A course that articulates with** [CSUSB PHYS 123]**, Basic Concepts of Physics III -** Continuation of PHYS 122. Topics include optics, waves, and modern physics.	**0-3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
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 for all Biology majors except the Emphasis in Bioengineering. The B.S. in Biology is an impacted major. The below information does not represent any guarantee with regard to admission nor does it include or replace SDSU's campus admissions impaction criteria. Please refer to http://www.calstate.edu/AR/impactioninfo.shtml for SDSU's impaction criteria.

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern, complete all of the following:	
• **A course that articulates with** [SDSU PHYS 180A]**, Fundamentals of Physics.** And	**0-3 units**
• **A course that articulates with** [SDSU PHYS 182A]**, Physical Measurements (lab).** And	**0-1 units**
• **A course that articulates with** [SDSU PHYS 180B]**, Fundamentals of Physics.** And	**0-3 units**
• **A course that articulates with** [SDSU PHYS 182B]**, Physical Measurements (lab).** And	**0-1 units**
• **A course that articulates with** [SDSU CHEM 231]**, Organic Chemistry.** And	**0-4 units**
• **A course that articulates with** [SDSU BIOL 215]**, Biostatistics.**	**0-3 units**
(2) If not taken as part of the statewide pattern, complete one of the following options:	**0-6 units**
• **A course that articulates with** [SDSU MATH 150]**, Calculus I.** Or	
• **A course that articulates with** [SDSU MATH 121 and 122]**, Calculus for the Life Sciences I and II.**	
(3) Students must complete 60 (but not more than 70) transferable semester units. Coursework not taken at the community college must be completed at SDSU.	

In addition to the statewide pattern, the following is the San Diego State University campus-specific pattern for the Biology major with an Emphasis in Bioengineering. The B.S. in Biology with an Emphasis in Bioengineering is an impacted major. The below information does not represent any guarantee with regard to admission nor does it include or replace SDSU's campus admissions impaction criteria. Please refer to http://www.calstate.edu/AR/impactioninfo.shtml for SDSU's impaction criteria.

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern, complete all of the following:	
• **A course that articulates with** [SDSU PHYS 195]**, Principles of Physics.** And	**0-3 units**
• **A course that articulates with** [SDSU PHYS 196]**, Principles of Physics.** And	**0-3 units**
• **A course that articulates with** [SDSU PHYS 197]**, Principles of Physics.** And	**0-3 units**
• **A course that articulates with** [SDSU MATH 150]**, Calculus I.** And	**0-4 units**
• **A course that articulates with** [SDSU MATH 151]**, Calculus II.** And	**0-4 units**
• **A course that articulates with** [SDSU MATH 252]**, Calculus III.** And	**0-4 units**
• **A course that articulates with** [SDSU CHEM 231]**, Organic Chemistry.** And	**0-4 units**
• **A course that articulates with** [SDSU E E 204]**, Principles of Electrical Engineering.** And	**0-3 units**
• **A course that articulates with** [SDSU E M 200]**, Statics.** And	**0-3 units**
• **A course that articulates with** [SDSU M E 101]**, Solid Modeling I**. And	**0-2 units**
• **A course that articulates with** [SDSU M E 240]**, Intro to Engineering Materials.**	**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.	

Biology and Microbiology
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 in Biology and Biology with a concentration in Microbiology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following:	
• **A course that articulates with** [SFSU PHYS 111/112]**, General Physics I** - Mechanics, heat, and sound using algebra and trigonometry. Mechanics, heat, and sound lab. And	**0-4 units**
• **A course that articulates with** [SFSU PHYS 121/122]**, General Physics II** - Light, electricity, magnetism, atoms, and modern physics. Light, electricity, magnetism, atoms, and modern physics lab. And	**0-4 units**
• **A course that articulates with CSU GE Breadth AREA E – Lifelong Understanding and Self –Development.** And	**3 units**
• **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. *A minimum grade of C is necessary in courses used to meet this requirement.* And	**0-3 units**
• **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. *A minimum grade of C is necessary in courses used to meet this requirement.*	**0-3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Students interested in demonstrating competency for the single subject credential in Science (Concentration in Biological Sciences) for teaching at the K-12 levels should consider completing lower-division courses with lab that cover the geosciences breadth requirements (astronomy, geology, meteorology, and oceanography).

Biology and Microbiology
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 BA or BS in Biological Science (including all concentrations):

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:	
• **A course that articulates with** [SJSU PHYS 002A]**, Fundamentals of Physics.** And	**0-4 units**
• **A course that articulates with** [SJSU PHYS 002B]**, Fundamentals of Physics.** And	**0-4 units**
• **A course that approved for CSU GE Breadth AREA E – Lifelong Understanding and Self –Development. And**	**3 units**
• **A course that articulates with** [SJSU ENGL 001B], **Composition 2,** or an equivalent 2nd Semester English Composition course approved for IGETC Area 1B. *A minimum grade of C or higher is required in courses used to meet this requirement.* And	**0-3 units**
• **Physical Activity.** *Two units taken in at least two different activities.*	**0-2 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology & Microbiology
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 in Biology or Microbiology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following:	
• **A course that articulates with** [SLO PHYS 121]**, College Physics I.** And	**0-3 units**
• **A course that articulates with** [SLO PHYS 122]**, College Physics II.** And	**0-3 units**
• **A course that articulates with** [SLO PHYS 123]**, College Physics III.**	**0-3 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
LOWER-DIVISION TRANSFER PATTERN
CSU San Marcos Campus-Specific Pattern

In addition to the statewide pattern, the following is the CSU San Marcos campus-specific pattern in Biology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CSUSM CHEM 201 & CHEM 201L]**, Organic Chemistry for Science Majors w/ Lab, 1st Semester.** And • **A course that articulates with** [CSUSM CHEM 202 & CHEM 202L]**, Organic Chemistry for Science Majors, 2nd Semester (lab not required).** And • **A course that articulates with** [CSUSM PHYS 205 & PHYS 206]**, Physics (Calculus based).**	**0-5 units** **0-3 units** **0-8 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
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 in Biology or Microbiology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with** [CAN STAT 2]**, Statistics.** And • **A course that articulates with** [CAN CHEM 22]**, Organic Chemistry for Science majors with Lab, 1st semester.**	**0-3 units** **0-5 units**
(2) If necessary, complete additional coursework to bring total to 60 transferable semester units.	

Biology and Microbiology
LOWER-DIVISION TRANSFER PATTERN
CSU Stanislaus Campus-Specific Pattern

In addition to the statewide pattern, the following is the CSU Stanislaus campus-specific pattern in Biology or Microbiology:

Campus-Specific Pattern	Semester Unit Requirement
(1) If not taken as part of the statewide pattern complete all of the following: • **A course that articulates with a Computer Science course (Area E.1).** And • **A course that articulates with a Physical Education Activity.** *If exempt (e.g. age of 25+ years), an elective course (Area E.2).*	**0-3 units** **0-3 units**
(2) If not taken as part of the statewide pattern complete at least one of the following Area D GE requirements for CSU-Stanislaus: • **A course that articulates with United States History (Area D.1.a).** Or • **A course that articulates with United States Government (Area D.1.b.) and California State and local government.** Or • **A course that articulates with Human Institutions: Structures and Processes (Area D.2.a.).** Or	**0-3 units**

• **A course that articulates with Society and Culture (Area D.2.b.).**	
(3) If not taken as part of the statewide pattern complete at least <u>one</u> of the following: • **A course that articulates with** [CAN MATH 16]**, Pre-Calculus.** <u>Or</u> • **A course that articulates with** [CAN STAT 2]**, Statistics.**	**0-3 units**
(4) If necessary, complete additional coursework to bring total to 60 transferable semester units.	