

## Subject Matter Guidance – Science: Biological Science

All credential candidates must demonstrate their proficiency in the subject matter of their intended credential. The CTC separates the required subject matter content into subtests, with each subtest covering specific domains (areas of knowledge). The following list summarizes all options available to meet the Subject Matter Requirement (SMR) for candidates interested in a Biological Science Credential:

- **Academic Major** in the subject area: the only degree majors currently approved to meet this requirement are a **Biological Science, Environmental Biology, Human Biology, or Marine Biology** degree.
- **Subject Matter Waiver**: earning an approved waiver in Biological Science based on classes taken as an undergraduate.
- **Coursework**: completion of coursework addressing *all of the domains* listed for that CSET subtest.
  - a. Courses must be degree applicable and non-remedial
  - b. A grade of a C- or better is required
  - c. Each subtest is independent of the other subtests (i.e., you might have coursework to clear subtest I but not subtest II.)
- **California Subject Examinations for Teachers (CSET)**: passing all required subtests Science
  - a. Subtest I – test code 215
  - b. Subtest II –Life Science (Biology) – test code 217
- **Combination of coursework and CSET examination(s)**: some combination of coursework and examinations to meet the content for all required subtests.
  1. Review the coursework options for any subtests where you have not met SMR by using the Biological Science by coursework worksheet. You must have taken a class in each and every domain listed for that subtest.
    - a. If yes, you have a course for every domain for that subtest, you may upload a copy of this form to your online application. Please note that an official review will not be conducted until after an applicant is admitted AND submits their intent to register into the program. Additional documentation may be requested and/or required.
    - b. If no, you have NOT taken a class in every domain listed for that subtest, you will need to pass the CSET exam for that subtest to meet SMR.

## BIOLOGICAL SCIENCE – By Coursework

SUBTEST I – Scientific Practices, Engineering Design and Applications, and Crosscutting Concepts + Physical Sciences + Life Sciences + Earth and Space Sciences			
General Science Domain 1: Scientific Practices, Engineering Design and Applications, and Crosscutting Concepts			
Subdomains	Course #	Course Description	Grade & Term Completed
Understand scientific practices			
Understand engineering practices, design, and applications			
Understand crosscutting concepts among the sciences and engineering			
General Science Domain 2: Physical Sciences			
Subdomains	Course #	Course Description	Grade & Term Completed
Understand structure and properties of matter			
Understand chemical reactions and biochemistry			
Understand motion and stability: forces and interactions			
Understand waves and their applications in technologies for information transfer			
Understand energy			
Understand electricity and magnetism			
General Science Domain 3: Life Sciences			
Subdomains	Course #	Course Description	Grade & Term Completed
Understand the structure and function of cells			
Understand growth, development and energy flow in organisms			
Understand ecosystems;			

interactions, energy and dynamics			
Understand heredity: inheritance and variation of traits			
Understand biological evolution: unity and diversity			
<b>General Science Domain 4: Earth and Space Sciences</b>			
<b>Subdomains</b>	<b>Course #</b>	<b>Course Description</b>	<b>Grade &amp; Term Completed</b>
Understand Earth's place in the universe			
Understand Earth's materials and systems and surface processes			
Understand plate tectonics and large scale systems interactions			
Understand weather and climate			
Understand natural resources and natural hazards			

SUBTEST II – Concentration: Life Science			
<b>Biology Domain 1: From Molecules to Organisms: Structures and Processes</b>			
<b>Subdomain</b>	<b>Course #</b>	<b>Course Description</b>	<b>Grade &amp; term completed</b>
Understand the structure and function of cells			
Understand the hierarchical organization and functioning of systems in multicellular organisms			
Understand growth and development of organisms			
Understand matter and energy flow in organisms			

<b>Biology Domain 2: Ecosystems: Interactions, Energy and Dynamics</b>			
<b>Subdomain</b>	<b>Course #</b>	<b>Course Description</b>	<b>Grade &amp; term completed</b>
Understand interdependent relationships in ecosystems			
Understand cycles of matter and energy transfer in ecosystems			
Understand ecosystem dynamics, functioning, and resilience			
<b>Biology Domain 3: Heredity: Inheritance and Variation of Traits</b>			
<b>Subdomain</b>	<b>Course #</b>	<b>Course Description</b>	<b>Grade &amp; Term Completed</b>
Understand inheritance of traits			
Understand variation of traits and genetic engineering			
<b>Biology Domain 4: Biological Evolution: Unity and Diversity</b>			
<b>Subdomain</b>	<b>Course #</b>	<b>Course Description</b>	<b>Grade &amp; Term Completed</b>
Understand evidence of common ancestry and diversity			
Understand natural selection			
Understand adaptation			

If you need clarification as to what content/elements are in each of these domains, you may review the list of elements on the CTC website [here](#). See page 2 for the index.

***Important note:***

***This evaluation is based on the CTC regulatory guidelines currently in effect. Should the CTC regulatory guidelines change prior to your being recommended for your Preliminary Credential, you would need to meet the new guidelines.***