



CODED CORRESPONDENCE

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TO:

All Individuals and Groups Interested in the Activities of
the Commission on Teacher Credentialing

FROM:

Mary Vixie Sandy
Executive Director
Commission on Teacher Credentialing

SUBJECT: Approval of Amendments to Title 5 Regulations Pertaining to the Supplementary Authorization in Computer Science

Summary:

Amendments to Title 5 sections 80057.5 and 80089, 80089.1, and 80089.2 of the California Code of Regulations (CCR) pertaining to the Supplementary Authorization in Computer Science were approved by the Office of Administrative Law and became effective on April 1, 2016. The approved amendments pertain to changing the name of the Supplementary Authorization in Computer Concepts and Applications (CCA) to Computer Science and revising the required content areas of study educators must complete to obtain the Supplementary Authorization in Computer Science.

The approved amendments also include updated requirements pertaining to earning a supplementary authorization in a world language other than English, replacing options for verifying target language proficiency that are no longer available. These amendments will go into effect July 1, 2016.

Key Provisions:

The approved amendments include the following changes:

- Change the name of the Supplementary Authorization in Computer Concepts and Applications to Computer Science.
- Specify the required content areas of study educators must complete to obtain the Supplementary Authorization in Computer Science.
- Update of sections that refer to options to qualify for a supplementary authorization in a world language that are no longer available.

Important Dates:

April 1, 2016 – Revised Supplementary Authorization in Computer Science goes into effect

April 1, 2016 – Last issuance date for an initial supplementary authorization in Computer Concepts and Applications

July 1, 2016 – Updated sections for target language proficiency go into effect

Background:

At the June 2015 Commission meeting (<http://www.ctc.ca.gov/commission/agendas/2015-06/2015-06-7B.pdf>), Commissioners approved amendments to Title 5 regulations pertaining to the Supplementary Authorization in CCA to strengthen the required Content Areas of Study and to change the name of the Supplementary Authorization to Computer Science.

This change reflects the shift in focus from content preparation for teaching basic computer use, keyboarding, and software applications to more relevant 21st century content inclusive of the range of Computer Science courses taught in California public schools. The approved amendments include revised Content Areas of Study for the Supplementary Authorization to serve as a basis to ensure teachers have the requisite content knowledge to provide instruction in the range of K-12 Computer Science courses now offered in California public schools.

The chart below provides the scope of the Content Areas of Study now required for the Supplementary Authorization in Computer Science.

Authorization	Unit Requirements	Content Areas of Study- Computer Science
<p><i>Introductory Supplementary Authorization</i></p> <ul style="list-style-type: none"> Listed on Multiple Subject/Elementary Credentials for teaching grades 9 and below Listed on Single Subject/Secondary Credentials for teaching curriculum level grade 9 and below; students may be in grades K-12 	<p>20 Semester Units¹ or 10 Semester Units of Upper Division or Graduate Level Coursework</p>	<p>Requires coursework covering each content area:²</p> <ul style="list-style-type: none"> computational thinking computing practice and programming computers and communication devices impacts of computing³ (e.g., social, ethical, legal)
<p><i>Specific Subject Supplementary Authorization</i></p> <ul style="list-style-type: none"> Listed only on Single Subject/Secondary Credentials for teaching content in grades K-12 	<p>20 Semester Units¹ or 10 Semester Units of Upper Division or Graduate Level Coursework</p>	<p>Requires coursework covering each content area:²</p> <ul style="list-style-type: none"> computer programming data structures and algorithms digital devices, systems and networks software design impacts of computing³ (e.g., social, ethical, legal)



¹ All lower division units or a combination of upper and lower division units.

² The balance of the units may be in any course that falls within the academic department for that subject category. Computer classes in the Education Department may be used **including a pedagogy course in computer science from either department.**

³ These topics may be included within courses covering the other content areas.

For the Introductory Supplementary Authorization in Computer Science, coursework completed must cover the following content areas:

- **Computational thinking:** involves solving problems and designing systems, using fundamental computing concepts such as decomposition, data representation, generalization/abstraction, and algorithms.
- **Computing practice and programming:** includes expertise in at least one block--- based, visual (drag-and-drop) programming language (e.g., Alice, Blockly, Kodu, Logo, Scratch, Snap!) or a modern, high-level programming language.
- **Computer and communications devices:** covers the major components and functions of digital devices and the computing systems they compose.
- **Impacts of computing:** includes the social, ethical, and legal issues and impacts of computing, as well as the contributions of computer science to current and future innovations in the arts, business, humanities, medicine, and science. These topics may be included within courses covering the other content areas.

For the Specific Supplementary Authorization in Computer Science, coursework completed must cover the following content areas:

- **Computer Programming:** includes expertise in at least one modern, high-level programming language (e.g., Python, Java, C/C++/C#).
- **Data structures and algorithms:** covers data representation, abstraction, searching and sorting in the context of solving problems using programming and computational tools.
- **Digital devices, systems and networks:** covers computer and communication devices and the systems they compose, including the concepts and abstractions that enable stand-alone, networked, and mobile digital devices to operate and communicate.
- **Software design:** covers the process of planning, engineering and implementing a software system to solve a problem, typically using both a design and a programming methodology, such as object-oriented and functional approaches.
- **Impacts of computing:** includes the social, ethical, and legal issues and impacts of computing, as well as the contributions of computer science to current and future innovations in the arts, business, humanities, medicine, and science. These topics may be included within courses covering the other content areas.

As specified in statute, all teachers who are currently authorized to teach the range of courses in Computer Science remain authorized to provide this instruction. This includes holders of the



Supplementary Authorization in CCA or a Single Subject teaching credential in Mathematics, Business, or Industrial Technology Education. The revised Supplementary Authorization in Computer Science provides an additional pathway educators can pursue that very clearly targets preparation and instruction pertinent to this content area.

The approved regulations became effective April 1, 2016. Individuals completing coursework after April 1, 2016 will have to qualify for the Supplementary Authorization in Computer Science based on the revised Content Areas of Study for Computer Science. Applications will continue to be accepted for the Supplementary Authorization in CCA if the issuance date is no later than April 1, 2016. All coursework for the Supplementary Authorization in CCA must have been completed no later than April 1, 2016.

The approved regulations also include changes in 5 CCR sections 80057.5(b) and 80089.2(a) updating of sections used to verify target language proficiency to qualify for supplementary authorizations in languages other than English due to options for examinations that have expired and have been replaced with new examinations.

Source:

Education Code sections 44225, 44256, and 44349. Title 5, California Code of Regulations sections 80057.5, 80089, 80089.1, & 80089.2.

Contact Information:

Commission's Information Services Unit by email at credentials@ctc.ca.gov or by telephone at (916) 322-4974 Monday through Friday from 12:30 pm to 4:30 pm.



CALIFORNIA CODE OF REGULATIONS
TITLE 5. EDUCATION
DIVISION 8. COMMISSION ON TEACHER CREDENTIALING

§80057.5. Adding Supplementary Authorizations to Teaching Credentials Used Predominantly in Elementary Schools.

(a) The holder of a valid teaching credential specified in Education Code Section 44256(b) may have one or more of the subjects listed in subsection (c) added as a supplementary authorization. The candidate or an approved institution shall verify completion of either (1) or (2) below:

- (1) 20 semester hours or 10 upper division semester hours of non-remedial collegiate course work in each subject from subsection (c) to be listed, or
- (2) a collegiate major in a subject directly related to each subject from subsection (c) to be listed.

A "C" grade or above in any course used to meet the provisions of this section shall be required. Non-remedial coursework for the purposes of this section shall be defined as coursework that is applicable toward a bachelor's degree or a higher degree at a regionally accredited college or university.

(b) Candidates seeking supplementary authorization in any language other than English shall, in addition to requirements specified in subsection (a), submit verification of having either (1), (2), (3), or (4) below:

- (1) passed the Language and Communication/Listening and Oral Communication section (Test II or III depending on the specific language) of the CSET: World Languages Examinations in the target language. Passing examination scores are valid for certification use for five years from the individual test date pursuant to Section 80071(b); or
- (2) if no CSET: World Languages Examination is available in the target language, evidence of having passed an assessment performed by an approved organization pursuant to Education Code Section 44253.5(a) covering the integrated communication skills of listening, speaking, reading and writing in the target language; or
- (3) possession of a three-year or higher degree from a foreign institution in which all instruction was delivered in the target language. The foreign institution must be equivalent in status to a regionally-accredited institution of higher education in the United States; or
- (4) passed an assessment covering the integrated communication skills of listening, speaking, reading and writing administered by a California college or university as a part of its Commission-approved bilingual authorization program in the target language.

(c) The following subjects may be added as supplementary authorizations to a valid teaching credential specified in Education Code Section 44256(b):

- (1) Agriculture, including at least one course in each of the following areas: animal science,



- plant science, and agricultural mechanics;
- (2) Art, including at least one course in each of the following areas: drawing and painting, art history or appreciation, and crafts;
 - (3) Business, including at least one course in each of the following areas: business management, business marketing or introduction to business, computer concepts and applications, economics, business communications or business English, and accounting;
 - (4) Computer Science, including at least one course in each of the following areas: computational thinking; computing practice and programming; computer and communications devices; and impacts of computing. The course of study must cover all content areas but impacts of computing may be met within a single course also used to meet one of the other required content areas;
 - (5) English, including at least one course in each of the following areas: grammar or language structure, composition, and literature;
 - (6) A Language Other Than English (Specify), including at least one course in the language covering each of the following areas: grammar, composition, conversation, and literature;
 - (7) Health Science, including at least one course in each of the following areas: substance abuse (including alcohol, drug, and tobacco), family life education (including human sexuality, HIV/AIDS, and sexually transmitted diseases), nutrition, comprehensive school health systems or programs, and health education theory, behavior, or foundations;
 - (8) Home Economics, including at least one course in each of the following areas: food and nutrition, clothing, child development, and family life and parenting;
 - (9) Industrial Arts, including at least one course in each of the following areas: drafting or graphic arts, woods or metals, and electricity or electronics;
 - (10) Mathematics, including at least one course in each of the following areas (all course work shall be at least at a level for which intermediate algebra is a prerequisite): algebra, geometry, and development of the real number system or introduction to mathematics; or three courses in calculus or other mathematics courses for which algebra and geometry are prerequisites;
 - (11) Music, including at least one course in each of the following areas: vocal music, instrumental music, music history or appreciation, and music theory;
 - (12) Physical Education, including at least one course in each of the following areas: team sports and games, fundamental and creative movement skills (such as dance and gymnastics), human movement, motor development, and/or motor learning, and individual, dual, nontraditional and global sports and games (such as aquatics, conditioning, and archery);
 - (13) Science, including at least one course in each of the following areas: biological sciences, chemistry, geosciences, and physics; and
 - (14) Social Science, including at least one course in each of the following areas: United States



history, California history, world history, geography, and United States government.

- (d) Home Economics Supplementary Authorizations must include a laboratory component in one of the listed subject areas. The course of study must cover both subject areas of food and nutrition but a single course may be used to meet the requirement. The course of study must cover both subject areas of family life and parenting, but a single course may be used to meet the requirement.
- (e) Science Supplementary Authorizations Authorized by 80057.5((c)13) shall include a one-year sequence of courses in at least two of the listed subject areas. At least one course must include a laboratory component.
- (f) The course of study for the Computer Science Supplementary Authorization authorized by 80057.5(c)(4) must include coursework aligned with the following definitions:
 - (1) Computational thinking— includes solving problems and designing systems, using fundamental computing concepts such as decomposition, data representation, generalization/abstraction, and algorithms.
 - (2) Computing practice and programming—includes expertise in at least one block-based, visual (drag-and-drop) programming language, or a modern, high-level programming language.
 - (3) Computer and communications devices—covers the major components and functions of digital devices and the computing systems they compose.
 - (4) Impacts of computing: including the social, ethical, and legal issues and impacts of computing, as well as the contributions of computer science to current and future innovations in sciences, humanities, the arts, and commerce. These topics may be included within any of the courses covering content areas (f)(1) through (f)(3).
- (g) A subject specified in subsection (c) and listed on a teaching credential specified in Education Code Section 44256(b) as a supplementary authorization shall authorize the teaching of courses related to that subject in departmentalized classes in grades 9 and below.
- (h) Applicants currently enrolled in coursework toward completion of requirements for the Supplementary Authorization in Computer Concepts and Applications must complete the required coursework and submit an application for this supplementary authorization no later than April 1, 2016. After that date, applicants must complete coursework for the Supplementary Authorization in Computer Science that meets the definitions listed in (f)(1) through (f)(4).

Note: Authority cited: Section 44225(b), Education Code. Reference: Section 44256(b), Education Code.



§80089. Adding Supplementary Authorizations to Teaching Credentials Used Predominantly in Secondary Schools.

(a) The holder of a valid teaching credential specified in Education Code Section 44256(a) may have one or more of the subjects listed in Sections 80089.1 and 80089.2, added as a supplementary authorization. The candidate or an approved institution shall verify completion of either (1) or (2) below:

- (1) 20 semester hours or 10 upper division semester hours of non-remedial collegiate coursework in a subject listed in Sections 80089.1 or 80089.2, or
- (2) a collegiate major in a subject directly related to each subject listed in Sections 80089.1 or 80089.2. A “C” grade or above in any course used to meet provisions of this section shall be required. Non-remedial coursework for the purposes of this section shall be defined as coursework that is applicable to a bachelor's degree or a higher degree at a regionally accredited college or university.

(b) Authorization.

- (1) A supplementary authorization added under the provisions of Section 80089.1 authorizes the holder to teach that subject at any grade level; preschool, kindergarten, grades 1-12, or in classes organized primarily for adults;
- (2) A supplementary authorization added under the provisions of Section 80089.2 authorizes the holder to teach at any grade level (preschool, kindergarten, grades 1-12, or in classes organized primarily for adults) only the subject matter content typically included for that subject in curriculum guidelines and textbooks for study in grades 9 and below.

Note: Authority cited: Section 44225, Education Code. Reference: Sections 44256 and 44349, Education Code.

§80089.1. Subjects Added as Supplementary Authorizations (Specific Subjects).

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| <p>(a) The following listed subjects may be added as supplementary authorizations to a valid teaching credential specified in Education Code Section 44256(a):</p> <ul style="list-style-type: none"> Accounting (including Finance) Agricultural Mechanics Animal Science Anthropology Auto Mechanics Biological Sciences Chemistry Child Development (Home Economics) Clothing and Textiles (Home Economics) Comparative Political Systems and | <ul style="list-style-type: none"> International Relations Computer Science Consumer Education (Home Economics)
 Crafts, including Jewelry and Ceramics (Art) Dance Drafting Drama Economics Economic and Consumer Education Electronics English Composition Family Life and Parenting (Home Economics) |
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Family Life Education including Drug, Alcohol and Tobacco Use Prevention (Health Science)	Processing and Business
Food and Nutrition (Home Economics)	Communications
Forestry and Horticulture	Ornamental Horticulture
Geography	Painting and Drawing
Geosciences	Photography
Graphic Arts	Physics
Industrial Crafts and Plastics	Plant Science
Instrumental Music	Plastics (Industrial Arts)
Interior Design (Home Economics)	Psychology
Journalism	Sociology
Literature	Speech
Marketing/Entrepreneurship	US Government and US Civics
Metals (Industrial Arts)	US History and California History
Office Technologies including Word	Vocal Music
	Woods (Industrial Arts)
	World History

- (b) A supplementary authorization in a specific subject of Science may be added to a valid teaching credential specified in Education Code Section 44256(a). The course of study for Biological Sciences or Chemistry or Geosciences or Physics must include each of the components for that area. One of the courses must include a laboratory component.
- (1) Biological Sciences, including: Molecular and Cellular Biology, Biology of Organisms, and Evolution.
 - (2) Chemistry, including: Structure and Stability, and Chemical Reactions.
 - (3) Geosciences, including: Astronomy, Geology, Meteorology and Oceanography.
 - (4) Physics, including: Energy - Mechanics, Energy - Heat Energy - Electricity and Magnetism, Wave Motion and Atomic and Nuclear Physics
- (c) A supplementary authorization in each of the specific subjects of Child development (home economics), Clothing and textiles (home economics), Food and nutrition (home economics), and Interior design (home economics) must include a laboratory component.
- (d) A supplementary authorization in the subject of Family life education including drug, alcohol, and tobacco use prevention (health science) must include the following components: sexually transmitted disease including HIV/AIDS, human development and human sexuality, parenting education, violence prevention, and drug, alcohol and tobacco use, prevention and cessation.
- (e) A supplementary authorization in the specific subject of Computer Science may be added to a valid teaching credential specified in Education Code Section 44256(a). The course of study must include coursework covering the following components:
- (1) Computer Programming: including expertise in at least one modern, high-level



programming language;

- (2) Data structures and algorithms: data representation, abstraction, searching and sorting in the context of solving problems using programming and computational tools;
 - (3) Digital devices, systems and networks: covers devices and the systems they compose, including the concepts and abstractions that enable stand-alone, networked, and mobile digital devices to operate and communicate;
 - (4) Software design: the process of planning, engineering and implementing a software system to solve a problem, typically using both a design and a programming methodology. Programming methodologies that facilitate design include object-oriented and functional approaches; and
 - (5) Impacts of computing: including the social, ethical, and legal issues and impacts of computing, as well as the contributions of computer science to current and future innovations in sciences, humanities, the arts, and commerce. These topics may be included within any of the courses covering content areas (e)(1) through (e)(4).
- (f) Applicants currently enrolled in coursework toward completion of requirements for the Supplementary Authorization in Computer Concepts and Applications must complete the required coursework and submit an application for this supplementary authorization no later than April 1, 2016. After that date, applicants must complete coursework for the Supplementary Authorization in Computer Science that meets the definitions listed in (e)(1) through (e)(5).

Note: Authority cited: Section 44225, Education Code. Reference: Sections 44256 and 44349, Education Code.

§80089.2. Subjects Added as Introductory Supplementary Authorizations.

- (a) Candidates seeking supplementary authorization in any language other than English shall, in addition to requirements specified in Section 80089, submit verification of having either (1), (2), (3), or (4) below:
- (1) passed the Language and Communication/Listening and Oral Communication section (Test II or III depending on the specific language) of the CSET: World Languages Examinations in the target language. Passing examination scores are valid for certification use for five years from the individual test date pursuant to Section 80071(b); or
 - (2) if no CSET: World Languages Examination is available in the target language, evidence of having passed an assessment performed by an approved organization pursuant to Education Code Section 44253.5(a) covering the integrated communication skills of listening, speaking, reading and writing in the target language; or
 - (3) possession of a three-year or higher degree from a foreign institution in which all instruction was delivered in the target language. The foreign institution must be equivalent in status to a regionally-accredited institution of higher education in the United States; or



- (4) passed an assessment covering the integrated communication skills of listening, speaking, reading and writing administered by a California college or university as a part of its Commission-approved bilingual authorization program in the target language.
- (b) The following listed subjects may be added as introductory supplementary authorizations to a valid teaching credential specified in Education Code Section 44256(a).
- (1) Introductory Agriculture, including at least one course in each of the following areas: animal science, plant science, and agricultural mechanics;
 - (2) Introductory Art, including at least one course in each of the following areas: drawing and painting, art history or appreciation, and crafts;
 - (3) Introductory Business, including at least one course in each of the following areas: business management, business marketing or introduction to business, computer concepts and applications, economics, business communications or business English, and accounting;
 - (4) Introductory English, including at least one course in each of the following areas: composition, literature, and grammar or language structure;
 - (5) Introductory Language Other Than English (Specify), including at least one course in the language covering each of the following areas: grammar, composition, conversation, and literature;
 - (6) Introductory Health Sciences, including at least one course in each of the following areas: substance abuse (including alcohol, drug, and tobacco), family life education (including human sexuality, HIV/AIDS, and sexually transmitted diseases), nutrition, comprehensive school health systems or programs, and health education theory, behavior, or foundations;
 - (7) Introductory Home Economics, including at least one course in each of the following areas: food and nutrition, clothing, child development, and family life and parenting;
 - (8) Introductory Industrial Arts, including at least one course in each of the following areas: drafting or graphic arts, woods or metals, and electricity or electronics;
 - (9) Introductory Mathematics, including at least one course in each of the following areas (all course work shall be at least at a level for which intermediate algebra is a prerequisite): college algebra, geometry, and development of the real number system or introduction to mathematics; or three courses in calculus or other mathematics courses for which algebra and geometry are prerequisites;
 - (10) Introductory Music, including at least one course in each of the following areas: vocal music, instrumental music, music history or appreciation, and music theory;
 - (11) Introductory Physical Education, including at least one course in each of the following areas: team sports and games; fundamental and creative movement skills (such as dance and gymnastics); human movement, motor development, and/or motor learning; and individual, dual, nontraditional and global sports and games (such as aquatics,



- conditioning, and archery);
- (12) Introductory Science, including at least one course in each of the following areas: biological sciences, chemistry, geosciences, and physics; and
- (13) Introductory Social Science, including at least one course in each of the following areas: United States history, California history, world history, geography, and United States government.
- (14) Introductory Computer Science, including at least one course in each of the following areas: computational thinking, computing practice and programming, computer and communications devices, and the impacts of computing. The course of study must cover all content areas but impacts of computing may be met within a single course also used to meet one of the other required content areas.
- (c) Introductory Home Economics Supplementary Authorizations must include a laboratory component in one of the listed subject areas. The course of study must cover both subject areas of food and nutrition but a single course may be used to meet the requirement. The course of study must cover both subject areas of family life and parenting, but a single course may be used to meet the requirement.
- (d) Introductory Science Supplementary Authorizations Authorized by 80089.2(b)(12) shall include a one year sequence of courses in at least two of the listed subject areas. At least one course must include a laboratory component.
- (e) The course of study for the Introductory Computer Science Supplementary Authorization must include coursework aligned with the following definitions:
- (1) Computational thinking— includes solving problems and designing systems, using fundamental computing concepts such as decomposition, data representation, generalization/abstraction, and algorithms.
 - (2) Computing practice and programming—includes expertise in at least one block-based, visual (drag-and-drop) programming language, or a modern, high-level programming language.
 - (3) Computer and communications devices—covers the major components and functions of digital devices and the computing systems they compose.
 - (4) Impacts of computing: including the social, ethical, and legal issues and impacts of computing, as well as the contributions of computer science to current and future innovations in sciences, humanities, the arts, and commerce. These topics may be included within any of the courses covering content areas (e)(1) through (e)(3).
- (f) Applicants currently enrolled in coursework toward completion of requirements for the Supplementary Authorization in Computer Concepts and Applications must complete the required coursework and submit an application for this supplementary authorization no later than April 1, 2016. After that date, applicants must complete coursework for the



Supplementary Authorization in Computer Science that meets the definitions listed in (e)(1) through (e)(4).

Note: Authority cited: Section 44225, Education Code. Reference: Sections 44256 and 44349, Education Code.

