

**Division VIII of Title 5 of the California Code of Regulations Proposed
Amendments to Title 5 of the California Code of Regulations Pertaining to the
Supplementary Authorization in Computer Science**

Notice of Proposed Rulemaking

The Commission on Teacher Credentialing (Commission) proposes to take the regulatory action described below after considering all comments, objections, and recommendations regarding the proposed action. A copy of the proposed regulations is attached with the added text underlined and the deleted text lined out.

A public hearing on the proposed actions will be held:

October 9, 2015

8:30 a.m.

**Commission on Teacher Credentialing
1900 Capitol Avenue
Sacramento, California 95811**

Written Comment Period

Any interested person, or his or her authorized representative, may submit written comments by fax, through the mail, or by email relevant to the proposed action. The written comment period closes at 5:00 p.m. October 5, 2015. Comments must be received by that time or may be submitted at the public hearing. You may fax your response to (916) 322-0048; write to the Commission on Teacher Credentialing, attn. David Crable, 1900 Capitol Avenue, Sacramento, California 95811; or submit an email to dcrable@ctc.ca.gov.

Any written comments received 15 days prior to the public hearing will be reproduced by the Commission's staff for each member of the Commission as a courtesy to the person submitting the comments and will be included in the written agenda prepared for and presented to the full Commission at the hearing.

Authority and Reference

Education Code section 44225 authorizes the Commission to adopt the proposed regulations. The proposed regulations implement, interpret, and make specific Education Code section 44256 pertaining to requirements for supplementary authorizations. The proposed regulations also include amendments to the forms required during the application process.

Informative Digest/Policy Statement Overview

Summary of Existing Laws and Regulations

This rulemaking action proposes amendments to sections 80057 and 80089 of Title 5 of the California Code of Regulations (CCR) related to supplementary authorizations as approved by the Commission at the June 2015 meeting.

General Provisions

Supplementary Authorizations are limited subject area authorizations for departmentalized instruction that may be added to a general education teaching credential (i.e., Multiple Subject, Single Subject, or older equivalent). Supplementary Authorizations are based on the completion of coursework (20 lower division or 10 upper division/graduate semester units) in the subject area from a regionally accredited college or university. These authorizations and the units required are specified in statute. The Commission establishes the specific content areas of study for the coursework that must be completed within regulations.

The proposed amendments to regulations reflect a change in focus for the Supplementary Authorization in Computer Concepts and Applications (CCA) 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 proposed amendments include revised Content Areas of Study for the Supplementary Authorization to serve as a basis for increasing the capacity of teachers prepared to provide instruction in the range of K-12 Computer Science courses in California public schools. The proposed regulations also include changing the name of the Supplementary Authorization in CCA to Computer Science as well as general clean-up of outdated language within the same sections of these regulations.

Proposal for a Supplementary Authorization in Computer Science

Over the past year, Commission staff has engaged in a series of conversations with representatives from the Alliance for California Computing Education for Students and Schools (ACCESS) and the Computer Science Teachers Association (CSTA) about the current preparation and authorizations for teaching the range of K-12 Computer Science classes in California schools. It is important to note that what is encompassed by the discipline of Computer Science for K-12 students has changed. The broad Scope of Computer Science today is reflected in the following definition:

Computer Science is the study of computers and algorithmic processes, including their principles, their hardware and software designs, their applications, and their impact on society.¹

At the February 2015 Commission meeting (<http://www.ctc.ca.gov/commission/agendas/2015-02/2015-02-6B.pdf>), it was discussed how coursework offered in Computer Science in California public schools has evolved rapidly in recent years while the required Content Areas of Study for the Supplementary Authorization in CCA have remained the same since first developed in 1987.

To address concerns that educators receive the appropriate preparation to teach a range of relevant computer science courses to California students beyond basic computer functions and applications, Commissioners provided staff direction to bring forward proposed amendments to Title 5 regulations pertaining to the Supplementary Authorization in CCA.

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

The proposed regulations strengthen the required Content Areas of Study for the Supplementary Authorization to ensure holders have the requisite content knowledge to teach the scope of Computer Science classes now offered in California public schools. To reflect the broader approach to this content area, the proposed regulations include changing the name of this Supplementary Authorization to Computer Science.

California Education Code section 44256 specifies the types of supplementary authorizations that may be added to elementary and secondary teaching credentials, grade level limitations, and the units required so those specific elements remain the same as the current requirements. However, this section of statute also provides that the Commission, by regulation, may require evidence of additional competence as a condition for instruction in particular subjects.

The chart below provides the scope of the current Supplementary Authorizations in CCA and Content Areas of Study now required and the proposed modifications for the new Supplementary Authorizations in Computer Science, in the far right-hand column indicated by underlined text.

¹ CSTA K-12 Computer Science Standards, 2011,
<http://www.csta.acm.org/Curriculum/sub/K12Standards.html>

Authorization	Unit Requirements	Content Areas of Study- Computer Concepts and Applications	
		Current	Proposed
<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 	20 Semester Units ¹ or 10 Semester Units of Upper Division or Graduate Level Coursework	<p>Requires coursework covering each content area:³</p> <ul style="list-style-type: none"> software evaluation and selection hardware operation and functions² classroom uses of computers 	<p>Requires coursework covering each content area:³</p> <ul style="list-style-type: none"> computational thinking computing practice and programming computers and communication devices impacts of computing⁴ (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 	20 Semester Units ¹ or 10 Semester Units of Upper Division or Graduate Level Coursework	<ul style="list-style-type: none"> Specific Subject Supplementary Authorizations have no required content areas. All coursework must fall within the academic department for the subject category. 	<p>Requires coursework covering each content area:³</p> <ul style="list-style-type: none"> computer programming data structures and algorithms digital devices, systems and networks software design impacts of computing⁴ (e.g., social, ethical, legal)

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

² An Introduction to Data Processing may be used for hardware operations and functions. Java, Cobol, Basic, and Pascal are examples of computer languages and do not apply to hardware but are acceptable as electives toward the overall unit requirement.

³ 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.**

⁴ 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.

The Content Areas of Study coursework requirements for the Supplementary Authorization in CCA currently in regulations specifies coursework in content that has now become primarily addressed within the preliminary preparation program standards for all general and special education teaching credentials (i.e., software evaluation and selection, hardware operation and functions, and classroom uses of computers) in Program Standard 11: Using Technology in the Classroom (*Appendix A* in June 2015 agenda item 7B). The proposed modifications shown to the Content Areas of Study for the Supplementary Authorization in Computer Science reflect a more comprehensive preparation with direct relevance to the range of K-12 Computer Science courses offered in California public schools today.

The chart also includes as approved at the June 2015 meeting bifurcation of the required Content Areas of Study for both Introductory and Specific Subject Supplementary Authorizations in Computer Science. Presently, the holder of a Single Subject Teaching Credential may only obtain the Specific Subject Supplementary Authorization in CCA, which authorizes departmentalized teaching in the subject area in grades K-12 but does not require any specific Content Areas of Study within the semester units completed. As some Single Subject Credential holders with the Supplementary Authorization are teaching at the elementary and middle school level, the addition of an Introductory Supplementary Authorization in this content area for these teachers provides more flexibility to choose the level of Supplementary Authorization (Introductory or Specific) that is most appropriate and clarifies the coursework appropriate to each level. This additional option provides for a thorough but introductory level of content for teaching computer science intended for students through grade 9 and also aligns with the Content Areas of Study coursework requirements for holders of a Multiple Subject Credential teaching computer science to students in the same grade levels.

As specified in statute, all teachers who are currently authorized to teach the range of courses in Computer Science will remain authorized (e.g., holders of a Supplementary Authorization in CCA or a Single Subject teaching credential in Mathematics, Business, or Industrial Technology Education) even if the proposed amendments are adopted within regulations.

Only teachers initially earning one of these supplementary authorizations in the future would be required to satisfy the revised Content Areas of Study and be issued the Supplementary Authorization in Computer Science. The proposed regulations include an effective date of April 1, 2016 in order to provide transition time for teachers currently pursuing a Supplementary Authorization in CCA.

Objectives and Anticipated Benefits of the Proposed Regulations

The objectives of the proposed regulation amendments are to:

- 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
- general cleanup of sections that refer to options to obtain supplementary authorizations that are no longer available.

The Commission anticipates that the proposed amendments will benefit the welfare of students attending public schools in the State of California by assuring teachers seeking to teach Computer Science courses will have completed the comprehensive preparation required to provide meaningful instruction in the range of K-12 Computer Science courses available in California public schools. The proposed regulations will promote fairness and prevent discrimination by ensuring uniformity in the requirements individuals are held to when providing instruction to students in the content area of Computer Science. The Commission does not anticipate that the proposed regulations will result in the protection of public health and safety, worker safety, or the environment, the prevention of social inequity or an increase in openness and transparency in business and government.

Determination of Inconsistency/Incompatibility with Existing State Regulations

The Commission has determined that the proposed regulation amendments are not inconsistent or incompatible with existing regulations. After conducting a review for any regulations that would relate to or affect this area, the Commission has concluded that these are the only regulations that concern the supplementary authorization in Computer science in California.

Documents Incorporated by Reference:

None.

Documents Relied Upon in Preparing Regulations:

February 2015 Commission agenda item 6B:

<http://www.ctc.ca.gov/commission/agendas/2015-02/2015-02-6B.pdf>

June 2015 Commission agenda item 7B:

<http://www.ctc.ca.gov/commission/agendas/2015-06/2015-06-7B.pdf>

Disclosures Regarding the Proposed Actions

The Commission has made the following initial determinations:

Mandate to local agencies or school districts: None.

Other non-discretionary costs or savings imposed upon local agencies: None.

Cost or savings to any state agency: None.

Cost or savings in federal funding to the state: None.

Significant effect on housing costs: None.

Significant statewide adverse economic impact directly affecting businesses including the ability of California businesses to compete with businesses in other states: None.

These proposed regulations will not impose a cost on local agencies or school districts that must be reimbursed in accordance with Part 7 (commencing with section 17500) of the Government Code.

Cost impacts on a representative private person or business: The Commission is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

Statement of the Results of the Economic Impact Assessment [Govt. Code § 11346.5(a)(10)]: The Commission concludes that it is (1) unlikely that the proposal will create any jobs within the State of California; 2) unlikely that the proposal will eliminate any jobs within the State of California; 3) unlikely that the proposal will create any new businesses with the State of California; 4) unlikely that the proposal will eliminate any existing businesses within the State of California; and 5) unlikely the proposal would cause the expansion of businesses currently doing business within the State of California.

The Commission anticipates that the proposed amendments will benefit the welfare of students attending public schools in the State of California by assuring individuals seeking to teach Computer Science have completed the comprehensive preparation required to provide meaningful instruction in the range of K-12 Computer Science courses available in California public schools. The proposed regulations will promote fairness and prevent discrimination by ensuring uniformity in the requirements individuals must meet to obtain the Supplementary Authorization in Computer Science. The Commission does not anticipate that the proposed regulations will result in the protection of public health and safety,

worker safety, or the environment, the prevention of social inequity or an increase in openness and transparency in business and government.

Effect on small businesses: The proposed regulations will not have a significant adverse economic impact upon business. The proposed regulations apply only to individuals applying for credentials that authorize service in California’s public schools.

Consideration of Alternatives

In accordance with Government Code section 11346.5, subdivision (a)(13), the Commission must determine that no reasonable alternative considered by the agency or that has otherwise been identified and brought to the attention of the agency would be more effective in carrying out the purpose for which the action is proposed, would be as effective as and less burdensome to affected private persons than the proposed actions, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law. The Commission invites interested persons to present statements or arguments with respect to alternatives to the proposed regulations during the written comment period or at the public hearing.

Contact Person/Further Information

General or substantive inquiries concerning the proposed action may be directed to David Crable by telephone at (916) 323-5119 or write to David Crable, Commission on Teacher Credentialing, 1900 Capitol Avenue, Sacramento, CA 95811. General question inquiries may also be directed to Janet Bankovich (back-up contact) at (916) 323-7140 or at the address mentioned in the previous sentence. Upon request, a copy of the express terms of the proposed action and a copy of the initial statement of reasons will be made available. This information is also available on the Commission’s website at www.ctc.ca.gov. In addition, all the information on which this proposal is based is available for inspection and copying.

Availability of Statement of Reasons and Text of Proposed Regulations

The entire rulemaking file is available for inspection and copying throughout the rulemaking process at the Commission office at the above address. As of the date this notice is published in the Notice of Register, the rulemaking file consists of the Notice of Proposed Rulemaking, the proposed text of regulations, the Initial Statement of Reasons, and an economic impact assessment/analysis contained in the Initial Statement of Reasons, and the documents incorporated by reference. Copies may be obtained by contacting David Crable at the address or telephone number provided above.

Modification of Proposed Action

If the Commission proposes to modify the actions hereby proposed, the modifications (other than nonsubstantial or solely grammatical modifications) will be made available for public comment for at least 15 days before they are adopted.

Availability of Final Statement of Reasons

The Final Statement of Reasons is submitted to the Office of Administrative Law as part of the final rulemaking package, after the public hearing. Upon its completion, copies of the Final Statement of Reasons may be obtained by contacting David Crable at (916) 323-5119.

Availability of Documents on the Internet

Copies of the Notice of Proposed Rulemaking, the Initial Statement of Reasons, and the text of the regulations and the forms incorporated by reference in underline and strikeout can be accessed through the Commission’s website at www.ctc.ca.gov.