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Information

Professional Services Committee

Discussion of Preconditions for Foundational-Level Mathematics Subject Matter Programs

Executive Summary: This agenda item presents information related to Preconditions for Foundational-Level Mathematics Subject Matter Programs for Commission discussion.

Recommended Action: For information only

Presenter: Helen Hawley, Consultant,
Professional Services Division

Strategic Plan Goal: 1

Promote educational excellence through the preparation and certification of professional educators

- ◆ Sustain high quality standards for the preparation and performance of professional educators and for the accreditation of credential programs

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Discussion of Preconditions for Foundational-Level Mathematics Subject Matter Programs

Introduction

Preconditions for Foundational-Level Mathematics Subject Matter Programs (FLM) were adopted in 2003 and are consistent with the preconditions for other single subject matter programs by requiring 45 semester units of coursework in the specified content area. However, to date no FLM subject matter programs have been approved because the requirement of 45 semester units is not feasible when the content is restricted to foundational mathematics courses.

In December 2010 the Commission adopted preconditions for the Foundational-Level General Science Subject Matter Programs including the requirement of 32 semester units (<http://www.ctc.ca.gov/commission/agendas/2011-01/2011-01-2C.pdf>). This agenda item, similarly, reviews the purpose of Preconditions and provides a proposal to revise the Preconditions for the number of required units for Foundational-Level Mathematics Single Subject Matter Programs.

Background

For most of the Commission's teaching credentials, an individual may satisfy the subject matter requirement by passing the appropriate Commission-approved subject matter examination, currently the California Subject Examinations for Teachers (CSET), or by completing a Commission-approved subject matter preparation program. Due to the requirements of the federal No Child Left Behind (NCLB) law, all prospective multiple subject teachers must take and pass the CSET-Multiple Subjects examination.

A Commission-approved subject matter preparation program is defined by the appropriate adopted program standards and Preconditions (<http://www.ctc.ca.gov/educator-prep/STDS-subject-matter.html>). The specific content (depth and breadth) of the subject matter preparation program is defined by the adopted standards which address issues of quality of the preparation program. Preconditions define the requirements, either legal requirements or those set by Commission policy, such as the minimum or maximum number of units in a program, that an approved program must meet in addition to offering the prescribed content specified in the program standards. Provided below is the statement from the Single Subject Matter Handbooks regarding Preconditions:

A precondition is a requirement for initial and continued program approval. Unlike standards, preconditions specify requirements for program compliance, not program quality. The Commission determines whether a program complies with the adopted preconditions on the basis of a program document provided by the college or university. In the program review sequence, a program that meets all preconditions is eligible for a more intensive review to determine if the program's quality satisfies the Commission's standards.

While the Preconditions related to the number of required units vary across the content areas of the single subject matter preparation programs, the Commission has required a minimum of 45 semester units in the specified subject for all thirteen content areas. A sample set of Preconditions from the Mathematics subject matter standards is presented as Appendix A.

Preconditions for Foundational-Level Mathematics Subject Matter Programs

The Single Subject Teaching Credential in Foundational-Level Mathematics authorizes the holder to provide instruction in the content taught to the vast majority of California's K-12 public school math students: general mathematics, algebra, geometry, probability and statistics, and consumer mathematics. Instruction is permitted in grades twelve and below, including preschool, and in classes organized primarily for adults. This credential does not authorize teaching of higher levels of mathematics commonly taught in the higher secondary grades and beyond the scope of the mathematics content areas noted above.

Candidates for this credential can demonstrate subject matter competence through one of two ways. The first is by passing the first two subtests of the CSET Mathematics examination. Over the last five years since the inception of the examination, 9,568 individuals have taken the CSET Foundational-Level Mathematics examination with a 45% pass rate. The second way is by completing a Commission approved program. The Foundational-Level Mathematics credential can also be a pathway toward earning a Single Subject Mathematics authorization at a later time if a candidate meets additional subject matter course requirements or passes the additional CSET subject matter subtests in mathematics.

The Preconditions for Single Subject Credential programs in Foundational-Level Mathematics currently require 45 units in mathematics, the same number as the full single subject mathematics program (Appendix B). The primary difference between the two programs is that the Foundational-Level Mathematics Program may include 15 units of mathematics-based courses, such as engineering, physics and computer science as extended studies rather than the 15 units of extended study of mathematics required for the Mathematics subject matter program. However, 30 units of mathematics courses are required for both programs. The courses appropriate for the Foundational-Level Mathematics program would mostly be lower division mathematics courses, up through and including pre-calculus.

To date, no individuals have been able to complete a program of coursework for the Foundational-Level Mathematics Credential because no programs have been approved by the Commission. Since the option for program sponsors to offer Foundational-Level Mathematics programs was instituted by the Commission in 2003, only a few sponsors have submitted applications for an approved Foundational-Level Mathematics program even though 33 programs have been approved for the Single Subject Mathematics Credential. No Foundational-Level Mathematics subject matter programs have been approved because the number of units of mathematics courses required by the Preconditions exceeds the lower division mathematics courses available at universities. Program sponsors for mathematics have indicated that they are unable to offer 30 semester units of appropriate mathematics courses without redundancy or including higher level mathematics courses.

At the time that the Commission established the Foundational-Level Mathematics Single Subject Credential, it did so to provide additional pathways to teaching in a subject area that was, and continues to be, in critical need of qualified teachers. If the Commission intends to provide two routes for individuals to demonstrate subject matter competency for the Foundational-Level Mathematics subject matter requirement, the number of required units for the program option may need to be reconsidered. The Foundational-Level Mathematics credential limits the content an individual may teach to general mathematics, algebra, geometry, probability and statistics, and consumer mathematics. An individual must pass all three of the CSET Mathematics subtests to meet the full Mathematics subject matter requirement, while only two subtests are required for the Foundational-Level Mathematics authorization.

Given the lack of sufficient lower level mathematics coursework available at the postsecondary level, and given the more limited scope of content represented in the two CSET Mathematics subtests as compared to the full range represented in the full CSET mathematics examination, it may not be appropriate to require Foundational-Level Mathematics subject matter programs to contain the same number of units as the full Mathematics subject matter programs. One possibility is to consider federal requirements. The federal NCLB legislation identifies 32 semester units as one measure of a highly qualified teacher. Programs with fewer than 32 semester units would not satisfy the NCLB requirement. The following table shows a possible revision of the Commission’s current requirements pertaining to Mathematics credentials.

Required Semester Units	Adopted		Proposed Foundational Mathematics
	Mathematics	Foundational Mathematics	
Total	45	45	32
Core Mathematics Courses	30	30	20
Extended Study of Mathematics Courses	15		12
Extended Study of Mathematics-based or Affiliated Courses		15	

A 32 semester unit program with a minimum of 20 units in mathematics and 12 units in mathematics-based courses is fewer than the number of units required for a full Mathematics Single Subject credential and may or may not be sufficient to meet a university’s definition of a college degree in the subject. This reduction of units required would reflect the foundational nature of the credential but still would be consistent with subject matter competence requirements as defined for NCLB.

Currently, credentialed teachers have a 32 unit coursework option known as a “Subject Matter Authorization” (SMA). The SMA in Mathematics provides a very similar authorization as the Foundational-Level Mathematics authorization; however, the SMA cannot be earned as an initial teaching credential. In addition, a Foundational-Level Mathematics subject matter program would be an approved program aligned to K-12 mathematics standards with a recommendation from the program sponsor rather than following the currently prescribed SMA coursework in algebra, advanced algebra, geometry, probability or statistics, and the real number system.

Next Steps

Staff seeks direction from the Commission following discussion of this item as to whether the Commission would like an action item to follow at a subsequent Commission meeting for further consideration and possible adoption of proposed revised Preconditions for the Foundational-Level Mathematics subject matter preparation programs.

Appendix A

Adopted Preconditions for the Approval of Subject Matter Programs in Mathematics

To be approved by the Commission, a Subject Matter Program in Mathematics must comply with the following preconditions.

- (1) Each program of subject matter preparation for the Single Subject Teaching Credential in Mathematics shall include (a) a minimum of 30 semester units (or 45 quarter units) of core mathematics coursework that is directly related to subjects that are commonly taught in departmentalized mathematics classes in California public schools, and (b) a minimum of 15 semester units (or 22 quarter units) of coursework that provides extended study of the subject. These two requirements are elaborated in Preconditions 2 and 3.
- (2) The core of the program shall include coursework in subjects commonly taught in departmentalized classes of mathematics and related subjects in the California public schools such as algebra (or demonstrated proficiency), geometry, number theory, calculus, history of mathematics, and statistics and probability.
- (3) Extended studies (breadth, depth, perspective, concentrations) in the program shall be designed to supplement the core of the program.

In addition to describing how a program meets each standard of program quality in this handbook, the program document by an institution shall include the course titles, unit designations, catalog descriptions and syllabi of all courses in the program that are used to meet the standards. Program documents must also include a matrix that identifies which courses meet which subject matter requirements.

Institutions may determine whether the standards are addressed through one or more courses for each commonly taught subject or courses offering integrated study of these subjects. Institutions may also define the program in terms of required or elective coursework. However, elective options must all meet the standards. Coursework offered by any appropriate department(s) of a regionally accredited institution may satisfy the preconditions and standards in this handbook. Programs may use general education courses in meeting the standards.

Appendix B

Adopted Preconditions for the Approval of Subject Matter Programs in Foundational-Level Mathematics

To be approved by the Commission, a Subject Matter Program in Foundational-Level Mathematics must comply with the following preconditions.

- (1) Each program of subject matter preparation for the Single Subject Teaching Credential in Foundational-Level Mathematics shall include (a) a minimum of 30 semester units (or 45 quarter units) of core mathematics coursework that is directly related to subjects that are commonly taught in departmentalized mathematics classes in California public schools, and (b) a minimum of 15 semester units (or 22 quarter units) of coursework that provides extended study of the subject. These two requirements are elaborated in Preconditions 2 and 3.
- (2) The core of the program shall include coursework in subjects commonly taught in departmentalized classes of mathematics and related subjects in the California public schools such as algebra (or demonstrated proficiency), geometry, number theory, and statistics and probability.
- (3) Extended studies (breadth, depth, perspective, concentrations) in the program shall be designed to supplement the core of the program.

In addition to describing how a program meets each standard of program quality in this handbook, the program document by an institution shall include the course titles, unit designations, catalog descriptions and syllabi of all courses in the program that are used to meet the standards. Program documents must also include a matrix that identifies which courses meet which subject matter requirements.

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