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Action

Professional Services Committee

Program Approval and Initial Accreditation

Executive Summary: This agenda item presents three single subject matter programs for program approval.

Recommended Action: That the Commission takes action to approve the single subject matter programs.

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Strategic Plan Goal: 1

Promote educational excellence through the preparation and certification of professional educators.

- ◆ Sustain high quality standards for the preparation of professional educators.
- ◆ Sustain high quality standards for the performance of credential candidates.

Program Approval and Initial Accreditation

Introduction

This agenda presents three single subject matter programs submitted by institutions of higher education for single subject matter program approval.

Part 1: Recommendation for Approval of Single Subject Matter Programs

Background

The Commission regularly hears recommendations from review panels for single subject matter program approvals. When those programs are recommended, they have been reviewed by subject matter experts and found to have met the common and specific subject matter standards which are aligned to the K-12 academic standards. These programs are usually undergraduate courses of study completed before candidates begin teacher preparation programs. However, in some cases they are completed concurrently with teacher education programs.

Subject Matter Program Review Procedures

Following are the general procedures for the review of new subject matter programs:

1. Technical Assistance – After the Commission adopts a set of new program standards, Commission staff members provide technical assistance to prospective program sponsors wishing to submit responses to the new standards. Technical assistance materials are provided on the Commission’s website. Staff members train, assign, and coordinate review teams.
2. Preconditions Review – After the program proposal is received, Commission staff review the sponsor’s response to the preconditions which are based on state laws and Commission policies that address minimum unit and content area requirements. If the preconditions response is incomplete, the sponsor is requested to provide specific information necessary for compliance with the preconditions.
3. Program Review –The program sponsor’s responses to the Commission’s subject matter program standards are reviewed by a team of two or more subject matter educators to determine if the program meets the program standards, including the SMRs. Reviewers are trained in the alignment of the standards and subject matter requirements and the review process before they are assigned proposals to review. Reviewers are instructed to find explicit evidence that programs are not only aligned with K-12 content standards but introduce their candidates to those standards within the context of their subject matter studies. The team must reach consensus that each standard is met based upon evidence

provided in the document. If the program does not meet the standards, the sponsor is given an explanation of the findings. The sponsor may then submit the additional information requested. Once reviewers determine that the program proposal provides a convincing and adequate body of evidence to meet the Commission's adopted subject matter program standards, the program approval is requested of the Commission.

4. After subject matter program approval is granted by the Commission, the institution may accept candidates in the approved subject matter program. Graduates of a Commission-approved single subject matter preparation program meet the Commission's subject matter requirement and are not required to take the subject matter examination (CSET).

This report presents three single subject matter programs which have been deemed to have met all of the appropriate *Standards of Quality and Effectiveness for Subject Matter Programs* (www.ctc.ca.gov/educator-prep/STDS-subject-matter.html) by the appropriate review panel and are recommended to the Commission for approval.

Summary Information on the Single Subject Matter Programs

California State University, San Bernardino: Mathematics

The mission of the Bachelor of Arts in Mathematics-Teaching Track (BAT) is to provide all students with the background necessary to pursue a career in teaching mathematics at the secondary school level. The program goal is to prepare mathematics teaching candidate with a solid understanding of mathematical concepts that is considerably deeper than what s/he will teach in the secondary school mathematics classroom. Candidates are expected to develop and demonstrate the ability to solve non-routine mathematics problems, including the ability to solve problems in more than one way and to place problems in context. The program requires candidates to communicate mathematical ideas verbally and in writing. The coursework conveys that reasoning is fundamental to learning and doing mathematics, and candidates formulate conjectures, construct proofs and counter examples, and evaluate the thinking of others.

Candidates who complete the BAT program will:

- Develop a conceptual knowledge of algebra and algebraic structures, including the abilities to reason symbolically and to use algebraic concepts to solve a variety of problems.
- Develop a conceptual knowledge of geometry and geometric structures, including an understanding of axiomatic systems and the ability to prove and apply theorems in two- and three-dimensional Euclidean geometry, non-Euclidean geometry, and transformation geometry.
- Develop a conceptual knowledge of number theory and its underlying structures, including the abilities to prove known properties of natural numbers and to formulate, and then prove or disprove, their own conjectures.
- Develop competence in functions of probability and statistics, including the abilities to solve problems and make inferences using statistics and probability distributions.
- Develop an understanding of trigonometry and calculus, and apply concepts to solve a variety of real-world problems.
- Develop an understanding of the chronological and topical development of mathematics.

Candidates are prepared to understand that applications of mathematics are all around us and to develop the ability to make connections both between areas of mathematics and to applications in other fields. The program includes the use technology in learning, teaching, and performing mathematical functions. The program introduces candidates to the roles of diverse groups and cultures in the development of mathematics and prepares them to teach mathematics to a diverse student population. Candidates must complete 60 units of mathematics successfully for a subject matter program equivalency.

San Diego State University: Mathematics

The design of the San Diego State program is consistent with the California Mathematics Content Standards in that it includes a sound introduction to each of the content areas covered in the 8-12 curriculums. Their program goal is produce graduates who are reflective learners and effective communicators. This is accomplished by providing high quality mathematics classes for graduates to develop strong conceptual understanding of the content that they will teach as well as a broad view of the more advanced mathematics that underlie the content they will teach.

The program outcomes are:

1. To promote prospective teachers' understanding of the core mathematics that they will teach.
2. To promote prospective teachers' understanding of higher level mathematics, including Linear Algebra, Modern Algebra, and Introductory Real Analysis (Advance Calculus).
3. To enhance prospective teachers' proclivity to use technology when appropriate to model mathematical relationships and explore connections.
4. To enhance prospective teachers' communication skills so that they can convey mathematical ideas confidently and effectively through both verbal and written means.
5. To promote prospective teachers' development of pedagogical content knowledge, which focuses on an appreciation for the variety of ways that children learn mathematics.

These outcomes are reached through studying the core concepts of mathematics: 1) single and multivariable functions, 2) logical argumentation, 3) historical development of mathematical ideas, 4) probability and statistics, and 5) formal structures of axiomatic systems. The faculty who prepare teachers are active contributors to mathematics research, and several hold elected board positions with mathematics research groups. The program also participates in The Improving Teachers Quality State Grants Program and The Professional Development Collaborative funded by Qualcomm to insure authentic connections with K-12 schools.

California State University, Fullerton: Mathematics

The Subject Matter Program in Mathematics at California State University, Fullerton, is based on a program philosophy which emphasizes quality of instruction and full exploration of the elements of the Mathematics curriculum to best prepare prospective teachers of Mathematics. The CSU Fullerton program is designed to prepare students in each of the content domains reflected in the *Mathematics Framework for California Public Schools: K through 12* and the Content Standards. Candidates are introduced to the state content standards early and continue to address them in each course in the program. The candidate outcomes are as follows:

- Develop critical thinking skills and ways to incorporate higher level thinking skills in all content areas for all students.
- Acquire strategies to teach writing.
- Recognize the proper use and limitations of various evaluation instruments.

- Become familiar with a variety of factors correlated with reading competence, including physical, intellectual, emotional, cultural, language, socioeconomic, and educational factors.
- Describe the role of technology in the teaching of reading in the content areas, and apply teaching strategies using technology.

The required sequence of courses ensures that students start at the elementary level – calculus – and proceed through upper division courses which deepen students’ understanding from an advanced point of view. The capstone courses provide a place to connect the K-12 Academic Content Standards and Mathematics Framework to the courses they have completed at the college level. Candidates will successfully complete 53 semester units of mathematics courses to complete the program requirements.

Recommendations

Single Subject Matter Programs

Staff recommends approval of the following single subject matter programs at the following institutions:

1. California State University, San Bernardino: Mathematics
2. San Diego State University: Mathematics
3. California State University, Fullerton: Mathematics

Based on the satisfactory review of responses to the appropriate *Standards of Quality and Effectiveness for Subject Matter Programs*, the sponsors meet the requirements for approval. Granting program approval to the program sponsors will allow the institutions to begin operation as SB 2042 single subject matter programs.