

TOPIC: RECOMMEND APPROVAL OF BACHELOR OF SCIENCE IN ENGINEERING EDUCATION AT UNIVERSITY OF COLORADO COLORADO SPRINGS

PREPARED BY: DR. IAN MACGILLIVRAY, DIRECTOR OF ACADEMIC AFFAIRS AND DR. ROBERT MITCHELL, ACADEMIC POLICY OFFICER FOR EDUCATOR PREPARATION

I. SUMMARY

This consent item recommends approval for University of Colorado Colorado Springs (UCCS) to offer a Bachelor of Science in Engineering Education, including (1) a waiver not to include the gtPathways general education core and (2) a waiver to exceed the 120 credit cap on baccalaureate degrees. This degree leads to educator endorsements for both secondary Mathematics (8.14) and Science (8.17).

II. BACKGROUND

Institutions are required to submit proposals for new degree programs and Department staff review the proposed degree for the statutory requirements listed under “Statutory Authority.” If the proposal meets the requirements, the proposed degree is recommended for approval. If the proposal does not meet the requirements, staff works with the institution.

III. STAFF ANALYSIS

OVERVIEW OF PROPOSED PROGRAM

The following is summarized from UCCS’s proposal:

The College of Engineering and Applied Science (EAS) at the University of Colorado - Colorado Springs (UCCS) proposes that the campus establish a new interdisciplinary Bachelor of Science degree in Engineering Education (BSEEd) in conjunction with the College of Education and the UCCSTeach program. The purpose of this program is to take the Math and Science curriculum preparation for highly qualified teachers and broaden that curriculum with Engineering and Technology exposure. The degree will be conferred by EAS and sanctioned by the College of Education, which is the unit responsible for state authorization and national accreditation. In the state of Colorado, secondary education degree programs may reside in the disciplinary area; we use this framework to add value to our development of Math and Science teachers.

The Bachelor of Science in Engineering Education degree represents a collaboration of several colleges on the UCCS campus, including coursework already offered by the College of Engineering and Applied Science as well as the

program components offered through the UCCSTeach program, the campus' partner affiliate of the UTeach national program. The proposed structure represents a highly integrated approach. The BSEEd degree offers a paradigm shift by preparing educators with a background in engineering as well as in education, math, and the traditional sciences. Graduates completing this new degree will be eligible for educator licensing in the state of Colorado in both math and science.

Additional information on this proposed degree, unrelated to fit with statutory role and mission, is in Appendix A.

ROLE AND MISSION SUPPORT

This degree supports UCCS's statutory role and mission, which states:

The Colorado Springs campus of the University of Colorado shall be a comprehensive baccalaureate and specialized graduate research university with selective admission standards. The Colorado Springs campus shall offer liberal arts and sciences, business, engineering, health sciences, and teacher preparation undergraduate degree programs, and a selected number of master's and doctoral degree programs. §23-20-101(1)(c), C.R.S.

Pursuant to Colorado Revised Statutes 23-5-129(6)(b), department staff finds that UCCS's proposed degree is consistent with the institution's statutory role and mission, qualifies for (1) a waiver from the Commission to exclude gtPathways requirements and (2) a waiver to exceed the 120 credit cap requirement for bachelor's degrees. The proposed degree has a general education core typical of engineering degrees and does not align with gtPathways as liberal arts degrees usually do. Also, the program is 128 credits. CU System's Board of Regents approved the program at its April 16, 2015 meeting.

The educator preparation programs at UCCS for both secondary Mathematics (8.14) and Science (8.17) are already approved. Since this degree incorporates those curricula, staff at CDE and the Department did not require any further review or approval of the educator preparation content.

IV. STAFF RECOMMENDATION

Staff recommends that the Commission approve University of Colorado Colorado Springs' proposal to offer a Bachelor of Science in Engineering Education, including a waiver not to include gtPathways requirements and to exceed the 120 credit cap for bachelor's degrees.

STATUTORY AUTHORITY

C.R.S. §23-1-125 Commission directive - student bill of rights - degree requirements - implementation of core courses - competency test - prior learning

(1)(a) Students should be able to complete their associate of arts and associate of science degree programs in no more than sixty credit hours or their baccalaureate programs in no more than one hundred twenty credit hours unless there are additional degree requirements recognized by the commission;

(3) Core courses. The department, in consultation with each Colorado public institution of higher education, is directed to outline a plan to implement a core course concept that defines the general education course guidelines for all public institutions of higher education... Individual institutions of higher education shall conform their own core course requirements with the guidelines developed by the department and shall identify the specific courses that meet the general education course guidelines. Any such guidelines developed by the department shall be submitted to the commission for its approval. In creating and adopting the guidelines, the department and the commission, in collaboration with the public institutions of higher education, may make allowances for baccalaureate programs that have additional degree requirements recognized by the commission;

C.R.S. §23-5-129 Governing boards - performance contract - authorization – operations

(6) While operating pursuant to a performance contract negotiated pursuant to this section, the governing board of a state institution of higher education:

(b) Need not consult with nor obtain approval from the Colorado commission on higher education to create, modify, or eliminate academic and vocational programs offered by the institution, so long as such creations, modifications, and eliminations are consistent with the institution's statutory role and mission. Institutions shall submit information to the department demonstrating that the creation or modification of an academic or career and technical education program is consistent with the institution's statutory role and mission. The Colorado commission on higher education shall have the authority to override the creation or modification of an academic or vocational program if the change made by the governing board is inconsistent with the institution's statutory role and mission.

APPENDIX:

Appendix A: Supplemental Information

APPENDIX A: SUPPLEMENTAL INFORMATION

This supplemental information is unrelated to the proposed degree's fit with the institution's statutory role and mission. The following is summarized from the institution's proposal:

EVIDENCE OF NEED

Assessing the State of STEM Education in Colorado by the Center for Education Policy Analysis at the University of Colorado, Denver; researchers found that of the 47,358 teachers in Colorado, nine percent taught math and six percent taught science. The analysis found that due to relatively low enrollment in math education preparation programs the supply of teacher candidates from Colorado is not sufficient to support the number of math and science teachers needed in our state. Statistics abound citing not only the need to improve and increase the overall numbers of students prepared to pursue post-secondary education in Science, Technology, Engineering, and Math (STEM) fields, but also in the underrepresentation of women and minorities in these fields. A contributing factor in this loss is the experience these students have with pre-college STEM subjects.

Based the number of students currently accessing the UCCSTeach program with interest in science and mathematics, it is expected that five to 10 students (nominally 7) may choose the BSEEd instead during the first year the program is offered. As familiarity with the program by the local and regional school districts grows, it is not unreasonable to expect program enrollment to reach 40 students within six years.

DUPLICATION

Currently, there are no other local programs serving the Colorado Springs metro area or the larger area of Southern Colorado. The proposed four year BSEEd differs from a similar five year program offered at CU-Boulder. That program offers engineering students the option of choosing a teaching emphasis as part of the traditional engineering degree. The proposed BSEEd is specifically designed for individuals who want to become licensed teachers in STEM, and the program content is constructed to reflect that.

In addition, from a regional standpoint, there are no other programs in engineering education that are situated in and directly serve southern Colorado which are designed for students desiring to be secondary teachers licensed in both Math and Science.