

**TOPIC: RECOMMEND APPROVAL OF BACHELOR OF SCIENCE IN
GENERAL ENGINEERING PLUS AT UNIVERSITY OF
COLORADO BOULDER**

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FOR ACADEMIC AFFAIRS**

I. SUMMARY

This item recommends approval for University of Colorado Boulder (UCB) to offer a Bachelor of Science in General Engineering Plus degree. It should be noted this degree has a variety of tracks, one of which leads to secondary teacher endorsement in Mathematics (8.14) and one in Science (8.17).

II. BACKGROUND

COMMISSION AUTHORITY

The Colorado Commission on Higher Education's role and responsibility in the review of new academic programs at institutions operating under a performance contract is to confirm the proposed program is consistent with the institution's statutory role and mission (per §23-5-129, C.R.S.) and, in the case of educator preparation programs, to ensure the proposed program is aligned with the requirements of §23-1-121, C.R.S. The process for initial approval of new educator preparation programs is as follows: Colorado Department of Education (CDE) conducts a review of the content of the endorsement program(s) to ensure that the content is designed and implemented in a manner that will enable a candidate to meet the requirements for licensure and endorsement in Colorado (C.R.S. §22-60.5). Given that requirements are met, CDE recommends approval of the content to the State Board of Education. Once State Board of Education has approved the content, DHE reviews the proposed program for the following statutory performance criteria: a comprehensive admission system; ongoing advising and screening of candidates; integration of theory and practice in coursework and field based training; supervised field based experience; and assessment of candidates' subject matter and professional knowledge and ability to apply the professional knowledge base [C.R.S. §23-1-121(2)].

OVERVIEW OF PROPOSED PROGRAM

The following is summarized from UCB's proposal:

Engineering Different, not "engineering lite". This degree is designed to provide an option for talented engineering students looking for something different from a traditional, discipline-specific degree. The student experience would equal that of our

current engineering students in tackling a tough engineering major, experiencing the challenge of preparing for and engaging in senior College of Engineering and Applied Science (CEAS) capstone courses, demonstrating mastery of mathematical concepts from Calculus I through Differential Equations, and exposure to extensive science coursework. The academic rigor is the same. But these students would be *different* from their CEAS peers in their deeper exposure to engineering design (the essential expertise they would bring to senior capstone projects) and to the extent that they customize their undergraduate experience. For the first time, engineering students would have a degree program option that can facilitate *choice* in a much larger way: study abroad, pursuing minors, special certification, and teacher licensure—would be available to engineering students as never before. The plus makes it a nontraditional approach to a general engineering degree, while the flexibility inherent in the degree allows students to have more choices within and external to engineering. Flexibility is provided through: choosing their 12-credit hour plus option; choosing their engineering emphasis among five degree-granting programs; choosing an expanded number of free electives; and through having experiences like study abroad more openly available.

The Plus Component. *General Engineering Plus* majors would also complete 18 humanities credit hours, and 12 credit hours of *purposeful electives* consisting of a student-chosen and previously contracted sequence of courses. For example, a student might choose variations such as General Engineering + *Teaching Licensure*, General Engineering + *Hydraulics*, General Engineering + *Pre-Med*, or General Engineering + *Environmental Economics*, etc. Like other CU undergraduate engineering degrees, *General Engineering Plus* would require a total of 128 credit hours; however, some “+” options (such as secondary STEM teacher licensure) would require more than 128 credit hours to complete both the engineering degree and an additional certificate, licensure, etc. The General Engineering + CU Teach degree program integrates design-focused engineering curriculum, extensive science or math content, education pedagogy courses and student teaching in a nationally replicable model. The CU Teach program track to the General Engineering degree requires collaboration with the CU Boulder School of Education; no other collaboration between campuses, schools or colleges is required for implementation of this new degree program.

Additional information on this proposed degree, unrelated to fit with statutory role and mission or educator preparation requirements, is attached (Attachment A).

III. STATE BOARD OF EDUCATION APPROVAL

CDE staff confirmed that the educator preparation content of this proposed degree does not vary from the content that was previously approved by State Board of Education during UCB’s last reauthorization site visit and content review in March 2009. No further review or approval is necessary for the proposed degree’s tracks that lead to secondary teacher endorsement in Mathematics (8.14) and one in Science (8.17). The numbers in parentheses refer to the endorsement number in the *Rules for the Administration of the Educator*

Licensing Act of 1991). Commission approval is contingent upon State Board of Education's approval of the content.

III. STAFF ANALYSIS

ROLE AND MISSION SUPPORT

This degree supports UCB's statutory role and mission, which states in part:

(a) ...The Boulder campus of the university of Colorado shall offer a comprehensive array of undergraduate, master's, and doctoral degree programs... 23-20-101(1), C.R.S.

Pursuant to Colorado Revised Statutes 23-5-129(6)(b), department staff finds that UCB's proposed Bachelor of Science in General Engineering Plus degree is consistent with the institution's statutory role and mission.

EDUCATOR PREPARATION STATUTORY PERFORMANCE MEASURES

Pursuant to §23-1-121(2), C.R.S., department staff reviewed this program and confirmed that it meets educator preparation performance criteria. Also, at its April 1, 2004 meeting, the Commission granted a waiver to all educator preparation and engineering programs to exceed 120 credits. Similarly, and in line with previous waivers not to have to include the entire gtPathways curriculum for degrees with additional requirements, staff confirms that this engineering degree meets the criteria for a gtPathways waiver.

IV. STAFF RECOMMENDATION

Staff recommends that the Commission approve University of Colorado Boulder's proposal to offer a Bachelor of Science in General Engineering Plus, with secondary teacher endorsement in Math (8.14) and Science (8.17), with a waiver not to have to include the entire gtPathways curriculum.

V. SUPPLEMENTAL INFORMATION

Copies of all relevant materials are on file in the Academic Affairs Division and are available upon request.

STATUTORY AUTHORITY

C.R.S. §23-1-121 Commission directive - approval of educator preparation programs - review.

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