

**TOPIC: RECOMMEND APPROVAL OF MASTER OF SCIENCE IN BIOMEDICAL SCIENCE AND BIOTECHNOLOGY AT UNIVERSITY OF COLORADO DENVER**

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**I. SUMMARY**

This item recommends approval for University of Colorado Denver (UCD) to offer a Master of Science in Biomedical Science and Biotechnology.

**II. BACKGROUND**

**COMMISSION AUTHORITY**

The Colorado Commission on Higher Education's role and responsibility in the review and approval of new academic programs at institutions operating under a performance contract is defined in §23-5-129(6)(b), which states that new and modified program proposals shall be reviewed and approved only on the basis of fit with the institution's statutory role and mission.

**III. STAFF ANALYSIS**

**OVERVIEW OF PROPOSED PROGRAM**

The following is summarized from UCD's proposal:

The Graduate School at the University of Colorado Denver | Anschutz Medical Campus proposes to offer a Master of Science (MS) degree in Biomedical Science and Biotechnology. The degree will require 36 credit hours. The foundation and basics of the program will be provided by 7 core courses. The advanced work will include electives plus an internship designed to match the student's interests and future plans. The required courses include introductory courses in: Biochemistry, Introduction to Biotechnology, Computer Science for Biologists, Molecular Biology Laboratory, Bioinformatics, Issues in Drug Development, Scientific Writing, and an Internship. All of these courses are part of the current graduate curricula in the participating schools and colleges. Students will have the option to choose four electives out of a total of 29 electives that are contributed by five participating colleges. The electives are organized in two different categories: 1) STEM disciplines and 2) Profession Skills, Business and Ethics, and the students will have to choose at least one elective from the professional skills courses. All of the courses that support the program are existing courses taught by current faculty at the University of

Colorado Denver | Anschutz. External funding in the form of an NIH BEST (Broadening Experience in Scientific Training) award has already been obtained to supplement program development.

The Master's Program in Biomedical Science and Biotechnology is designed in the concept of a Professional Science Master's (PSM) Program, a national designation offered by the Council of Graduate Schools. While employers are interested in employing highly trained PhD graduates, many also seek employees with less specialized but broad basic training in STEM disciplines, plus expertise in management, regulations, intellectual property and entrepreneurship. For recognition as a PSM program, a program must: be offered at an accredited university; require a majority of coursework in STEM disciplines; establish an advisory board with representatives who can be consulted for courses that train professional skills; and all students must enroll in an internship as a form of experimental learning and workforce training in a real-life setting. Upon approval of this degree, the Graduate School will seek this designation for the program, increasing its prestige and notoriety *for prospective students, internship sponsors, and advisory board members.*

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 UCD – Anschutz Medical Campus’s statutory role and mission, which states:

*(d) The health sciences center campus of the university of Colorado shall offer specialized baccalaureate, first-professional, master's, and doctoral degree programs in health-related disciplines and professions. It shall be affiliated with the university of Colorado hospital and other health care facilities that offer settings for education, clinical practice, and basic and applied research. It shall have exclusive authority in medicine, dentistry, pharmacy, and physical therapy. [§23-20-101, C.R.S.]*

Pursuant to Colorado Revised Statutes 23-5-129(6)(b), department staff finds that UCD’s proposed degree is consistent with the institution’s statutory role and mission. University of Colorado’s Board of Regents approved the program at its September 11, 2014 meeting.

#### **IV. STAFF RECOMMENDATION**

**Staff recommends that the Commission approve University of Colorado Denver’s proposal to offer a Master of Science in Biomedical Science and Biotechnology.**

**STATUTORY AUTHORITY**

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**

**Employer Demand:** The proposed degree program is designed to meet the increasing workforce demand in the rapidly expanding area of biomedical science and biotechnology. In a January 2013 report, the Metro Denver Economic Development Corporation describes the following Bioscience Metro Denver and Northern Colorado Industry Cluster Profile: "The Bioscience cluster is diverse both in size and scope, including companies that research develop and distribute products and services ranging from veterinary supplies and chemical testing kits to cutting edge pharmaceutical and medical devices and diagnostics. The cluster contributes to the growth and innovative capacity of other industries that transcend the bioscience cluster including healthcare and wellness, energy, information technology, and agriculture in the nine-county Denver and Northern Colorado region. Advances in biology and breakthroughs in human and animal health will continue to foster innovation and provide the nine-county region a leading role in forming collaborative bioscience partnerships and supporting bioscience infrastructure."

Similarly, the Colorado Office of Economic Development and International Trade reports: "Colorado's bioscience industry is building one of the most exciting and advanced industry clusters in the country. The state is currently home to a thriving industry, comprised of biotechnology, medical device, agricultural-bioscience, diagnostic, pharmaceutical, health care providers, research institutions and those businesses that provide critical services and products to bioscience companies. The bioscience industry in Colorado is a vital part of the state's economy, with employment growth surpassing the national average. Over 90 percent of the companies are located along the Front Range in close proximity to Colorado's nationally ranked research institutions."

**Student Demand:** In summer 2013, the CU Denver/Anschutz Graduate School conducted a survey of juniors and seniors in the CU Denver Biology Department to assess their interest in an Interdisciplinary Professional Science Master's Program in Biotechnology. While the Program will be open to students with backgrounds in all STEM disciplines, the majority of program applicants will likely have a BS degree in Biology or any of its sub-disciplines, such as, Microbiology, Genetics etc. More than 77% of the 98 students surveyed indicated that a Professional Science Master's Program could be a valuable educational opportunity for them and 80% of the surveyed students stated that they would be interested in applying if such a program would become available soon at CU Denver/Anschutz.

**DUPLICATION**

There are currently no graduate degree programs offered in Biotechnology within the state of Colorado. Colorado State University offers a baccalaureate degree, two community colleges (Northeastern Junior College, Red Rocks Community College) offer Associates of Science in Biotechnology and both CU Boulder and CU Denver offer Certificates in Biotechnology.