

**TOPIC: RECOMMEND APPROVAL OF PROFESSIONAL SCIENCE MASTER'S IN ENVIRONMENTAL GEOSCIENCES AT UNIVERSITY OF NORTHERN COLORADO**

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**I. SUMMARY**

This consent item recommends approval for University of Northern Colorado (UNC) to offer a Professional Science Master's (PSM) in Environmental Geosciences.

**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 UNC's proposal:

The Professional Science Master's (PSM) is an innovative, new graduate degree designed to allow students to pursue advanced training in science or mathematics, while simultaneously developing workplace skills highly valued by employers. PSM programs consist of two years of academic training in an emerging or interdisciplinary area, along with a professional component that may include internships and "cross-training" in workplace skills, such as business, communications, and regulatory affairs. All have been developed in concert with employers and are designed to dovetail into present and future professional career opportunities.

The Council of Graduate Schools oversees the PSM and certifies the degree programs. July 10, 2014, UNC's Department of Earth and Atmospheric Sciences received a letter from the PSM National Office officially granting UNC the Professional Science Masters Affiliation. No PSM may be offered without this approval and authorization.

Rationale for the degree offering is that many Science, Technology, Engineering, and Mathematics (STEM) bachelor's degree recipients enter the job market without requisite professional skills and experience to get a job. For those students and the benefit of the entire national STEM enterprise, the PSM degree requires that at least half of the degree credits be in graduate-level STEM courses, and the balance be in required graduate professional skills coursework (e.g. communications, accounting, organizational management, leadership), and a required external internship with a company or agency.

Each PSM student would be required to take at least 15 credit hours of science content. Students are also required to take 6-9 credit hours of course work emphasizing "workplace skills" in fields such as business, communication, and regulatory affairs. Many other graduate course offerings outside of Earth Sciences would be options for the PSM degree. Discussions have taken place with faculty in the MBA, Master of Accounting, MA in Communication Studies, STEM graduate programs, and health sciences graduate programs. For admission to the PSM, students are required to have a degree in a STEM field which will allow the students to be eligible for graduate courses in the STEM programs. If students have the qualifications and competencies for courses in the fields of business and communication studies the students will be allowed to take those courses.

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 UNC's statutory role and mission, which states:

*(1) There is hereby established a university at Greeley, to be known as the university of northern Colorado. The university shall be a comprehensive baccalaureate and specialized graduate research university with selective admission standards.*

*(2) The university of northern Colorado shall be the primary institution for undergraduate and graduate degree programs for educational personnel preparation in the state of Colorado. The university shall offer master's and doctoral programs primarily in the field of education. The university has the responsibility to offer on a statewide basis, utilizing where possible and appropriate the faculty and facilities of other educational institutions, those graduate-level programs needed by professional educators and education administrators. The Colorado commission on higher education shall include in its funding recommendations an appropriate level of general fund support for those programs. [§23-40-101, C.R.S.]*

Pursuant to Colorado Revised Statutes 23-5-129(6)(b), department staff finds that UNC's proposed Professional Science Master's (PSM) in Environmental Geosciences degree is

consistent with the institution's statutory role and mission. UNC's Board of Trustees approved the program at its March 6, 2015 meeting.

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

**Staff recommends that the Commission approve the Professional Science Master's (PSM) in Environmental Geosciences at University of Northern Colorado.**

#### **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**

During the Earth Sciences program review, the external reviewer explicitly recommended the PSM as replacement for the current MA in Earth Sciences. To emphasize the need for the program, the reviewer drafted a suggestion for a preliminary design and market. In a 2012 report released by the Council of Graduate Schools, enrollments in PSM degrees nationwide increased 15.4% over the previous year. Total PSM enrollment in fall 2013 was dominated by four fields of study: computer/information sciences (21%), environmental sciences and natural resources (15%), mathematics and statistics (15%), and biotechnology (14%). A PSM in Environmental Geosciences can expect strong enrollment based on these national trends.

In 2012, Weld County led the state in population growth (+3.7%) and weekly wage growth (+ 6.4%). In 2013, Weld County had the largest percentage increase in employment in the United States, 6% for the year as compared with 1.8% nationwide (US Bureau of Labor and Statistics) largely due to the oil and gas industry. To date, Weld County has roughly 18,000 oil and gas wells. Those wells support approximately 4,000 jobs and generate just under \$50 million in tax revenue for the county annually.

The hydro fracturing industry needs many scientifically-trained specialists, both for the geological resource extraction side and the environmental monitoring side of the venture. The same could be extrapolated for the water-development sector and the uranium development sector in this region. Colorado already has a strong minerals extraction sector for precious metals, coal, and sand & gravel resources. Enrollments in UNC undergraduate geology courses and students emphasizing geology are on the rise, and approaching historic highs last seen during the energy boom of the early 1980s. Many of the science graduates from UNC have asked about continuing graduate work in environmental geosciences and atmospheric sciences. The proposed PSM provides those students and many other UNC science students with a viable and appropriate path for advanced degrees.

### **DUPLICATION**

As of 1/28/15, there were 330 PSM programs at 156 institutions in the United States. There are three in Colorado, but none of them are in Geosciences. In bordering states there are very few PSM programs (WY-0, NE-1, KS-2, and UT 4). Of those seven other PSM programs, only one is in an environmental field (at Univ. of Utah). Since the PSM is a new and fundamentally different type of program from any previously offered, competition largely does not yet exist within a two day drive of UNC.