

Colorado School of Mines – UNDERGRADUATE COUNCIL MEETING MINUTES
January 13, 4:00 – 5:00 pm, via Zoom

Attendees:

Voting Members: 19 total (10 - majority needed for quorum). Quorum was present

P	Jeff King (chair)	P	Becky LaFrancois (EB)	P	Mike Nicholas (AMS)	P	Peter Aaen* proxy for Jeffrey Schowalter
P	Michael Barankin(CBE)	P	Derrick Hudson (HASS)	P	Corinne Packard (MME)	P	Nicole Smith (MN)
P	Dylan Domaille (CH)	P	Ge Jin (GP)	P	Jeff Paone (CS)	P	Bruce Trudgill (GE)
P	Linda Battalora (PE)	P	Hongyan Liu (CEE)	P	Oyvind Nilsen (ME)	A	Sydney Marchando (USG)*
P	Gyasi Evans (LB)	P	Carrie McClelland (EDS)	P	Todd Ruskell (PH)	P	Jordyn Helfrich *proxy for Sydney Marchando

Other Regular Attendees and Guests

A	Fran Aguilar (MS)	P	Dixie Cirillo (PA)	A	Jennie Kenney (RO)	P	Vibhuti Dave (UGS)
A	Jane Ko (RO)	P	Paul Myskiw (RO)	A	Justin Bush (CEE)	P	Jen Drumm (CASA)
A	Cheryl Medford (GE)	P	Terri Snyder (PE)	A	Karla Perez-Velez (CASA)	P	Katie Ludwin (CASA)
P	Mara Green (AA)						

*Angel Abbud-Madrid with Mining, Ning Wu, Jamal Rostami, Steve Enders, Alexandra Wallace, Jeffrey Holley, Masami Nakagawa, Lori Kester, Chuck Stone will be representing Todd Ruskell moving forward, Peter Aaen representing Jeff Schowalter due to retirement

Welcome

Jeff King

Approval of Minutes – December 9, 2020

Jeff King

MOTION: To approve the Undergraduate Council minutes of December 9, 2020 by Barankin; seconded by Liu. No abstentions. APPROVED.

Briefings and Information Items

- **Office of Undergraduate Studies**

Vihbuti Dave

Dave begins by addressing three topics of discussion: Academic Affairs is in the process of reviewing and updating the policies for Review Week and Finals Week at Mines, general guidelines around workload expectations per credit hour outside of classes and language regarding these expectations, and grades and the grading system used by faculty.

Dave states that some faculty use the A-, B, B+ grading system and others do not. Discussion will continue on creating a consistent system.

King addresses the first two topics of discussion in that there has been consideration of opening up Undergraduate Council subcommittees addressing Review and Finals week policies and workload expectations. The third discussion point brings up a discussion on academic freedom.

King states that mandated changes to grading will most likely run into enormous opposition as it affects academic freedom of the faculty, but it can be discussed within Council.

- **Registrar**

Paul Myskiw

Myskiw informs Councilors of an invitation that will be sent out to Faculty advisors regarding a new student advising component being implemented on Trailhead. It is called “Student Advisor Profile” and the component takes a summary of what a student is enrolled in, who the advisors are, demographics, as well as a picture of the advising faculty member.

For Fall 2021 registration, Myskiw states that a new version of registration is being rolled out with additional features.

Spring 2021 undergraduate enrollment is up compared to the Spring 2020 semester.

Curriculum Items for Council Vote

Minor Curriculum Changes – Request for Council Vote (from 12/9/20)

The following minor course changes will not be discussed unless specifically requested by Council.

1.1 MECHANICAL ENGINEERING

Oyvind Nilsen

[status: CIM 10/26; Provost approved 10/27]

1 new course: MEGN417: Vehicle Dynamics & Powertrain Systems

Prof. Bogin has taught this course as an MEGN498 for two years. This course is not a part of our Area of Emphasis in Automotive Engineering. It compliments other courses related to Automotive Engineering for our students.

MOTION: To approve the new Mechanical Engineering course MEGN417: Vehicle Dynamics & Powertrain Systems by Nilsen; seconded by Barankin. 1 abstention; Aaen. APPROVED.

Major Curriculum Changes – Request for Council Vote (from 12/9/20)

1.2 MECHANICAL ENGINEERING

Oyvind Nilsen

[status: CIM 10/29; Provost approved 10/29]

1 new program: Minor in Aerospace Engineering
(need to assign program & CIM codes)

This minor was proposed by our industry constituents and requested by students in mechanical engineering. Aerospace industries continue to grow in Colorado, and they represent five of the top ten employers for mechanical engineering. Aerospace industries do not require a full degree in aerospace engineering, but they feel that Mines students will be better prepared and more competitive with additional courses and practice in the aerospace field.

MOTION: To approve the new program to the Mechanical Engineering department: Minor in Aerospace Engineering by Barankin; seconded by Nilsen. 1 abstention; Aaen. APPROVED.

1.3 MINING

Jurgen Brune

[status: CIM 11/04; Provost approved 11/04]

1 new program: Minor in Space Mining
(need to assign program & CIM codes)

This minor is expected to draw students from non-traditional mining disciplines and increase enrollment in the department. The minor will also provide a pipeline of students who may be interested in pursuing Post-Baccalaureate certificates or MS and PhD degrees in the Space Resources graduate program.

A question is raised regarding the list of Economics and Business courses requested in the minor. The courses listed should include the undergraduate courses, not the graduate courses.

Rostami informs Councilors that these changes have been placed in CIM.

MOTION: To approve the new program to the Mining department: Minor in Space Mining by name; seconded by name. 1 abstention; Aen. APPROVED.

1.4 HONORS

Wendy Adams

[status: CIM 11/05; Provost approved 11/05]

1 new program: Minor in Teaching
(need to assign program & CIM codes)

This minor has demonstrated student interest with approximately 40 students per semester taking courses. With the coursework bundled within the minor, it will provide clear communication to the campus about this opportunity to become a well-prepared educator and it will provide transcript-ready recognition of the students' preparation to teach. It provides Mines students the opportunity to become highly-qualified science, math, and computer science teachers which addresses the heart of Mines@150 goals.

MOTION: To approve the new program in the Honors department: Minor in Teaching by name; seconded by name. 1 abstention; Aen. APPROVED.

New Curriculum Items

2.1 COMPUTER SCIENCE

Jeffrey Paone

[status: CIM 1/6]

1 program change: BS in Computer Science

1. *CS and Business Track: added EBG230 to list of business electives.*
2. *CS and Robotics & Intelligent Systems Track: updated focus area courses to provide flexibility in student's degree path. Focus areas divided into (1) Perception, (2) Cognition, (3) Interaction. Areas contain two courses. Students can take both courses in one area and one course from the other two areas.*
3. *CS and Space Track: Proposal driven by high demand of computer scientists in the aerospace industry. The curriculum was chosen after consulting with CS@Mines faculty, Director of Center for Space Resources at Mines, and several Lockheed Martin software engineers. Unique in its focus on interdisciplinary knowledge related to aerospace engineering and space resources.*

Paone presents on the program changes proposed for the Computer Science degree that includes updates to the current tracks and addition of the Computer Science and Space track.

The track is set-up in a way that students take all of the same Mines and CS core courses, but then have the flexibility to focus their interest in one of the different track areas. The courses are split between additional CS classes and non-CS classes depending on the department that has been partnered with.

The CS and Business track is currently set up with a list of business and economics classes that students can choose from, and CS has proposed the addition eligible courses to provide flexibility to the student.

The CS and Robotics and Intelligent Systems track is the least flexible of the degrees. At the initial creation of the track, there were less faculty and less robotics courses available—the changes proposed will expand the track's offerings now that faculty have been added in this area. This will also expand the opportunities

for students and provide them with additional flexibility to build the degree. The main change being the change from four 400-level courses to three focus areas where a student can take two courses from one of those areas and a single course from the other two focus areas.

Paone then addresses the largest track change being the addition of the CS and Space track. The track addition addresses the growing interest of Space on-campus as well as collaboration between the Space Resources department and Lockheed Martin. Students had been surveyed last year regarding interest in the track; 40% of respondents said they were interested in pursuing this as a possible venue.

The structure of the CS and Space track is similar to the previous tracks in that there is a mix of CS and Space Resources courses with an opportunity for students to choose electives and maintain degree flexibility.

A question is asked on the proposed changes to the Robotics track and if this causes a narrowed down view of robotics and what is gained or lost by taking four of the six courses offered. Paone responds that, structurally the track is the same but the presentation has been altered.

2.2 PETROLEUM ENGINEERING

Linda Battalora

[status: CIM 12/2]

1 program change: BS-PTE: BS in Petroleum Engineering

The Petroleum Engineering department in cooperation with the Trefny Center initiated a review of the petroleum engineering curriculum in Fall 2019. The goals include reduction of course rigidity; determination of material additions, deletions, and potential sequencing options; incorporation of technological capabilities such as online courses or other pedagogical approaches; explicit linking of courses to each other and documentation for staff, faculty and especially students.

Learning outcomes have been identified (total of seven). A determination of "phase changes" are being established.

Battalora provides background information on the changes to the Petroleum Engineering program, changes to the existing courses, and addition of courses. These changes have coincided with collaboration with the Trefny Center.

The primary goal of the changes are to reduce course rigidity, determine learning material additions such as data analysis of unconventional resources, make deletions and potential sequencing options that incorporate technological capabilities such as online programs or other pedagogical approaches, and to explicitly link the courses to one another.

The program has been updated to reflect the Mines@150 initiative. Seven learning outcomes have been identified:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science and mathematics
2. Apply engineering design to produce solutions that meet specific needs with consideration of public health, safety and welfare as well as global, cultural, social, environmental, and economic factors
3. Communicate effectively with a range of audiences
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgements which must consider the impact of engineering solutions on global, economic, environmental and societal context
5. Function effectively on a team whose members provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives

6. Develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions
7. Ability to acquire and apply new knowledge as needed using appropriate learning strategies

In order to make room for the proposed changes, courses have been removed and replaced.

[status: CIM 12/02]

2 course changes: PEGN311: Drilling Engineering

Currently, PEGN311 was 4 credit hours, 3 lecture, and 1 lab. Recent PEGN curriculum changes have been shifted with the proposed new course PEGN201: Petroleum Engineering Fundamentals. To fit within the credit hour limits of the overall curriculum as well as within the semester the drilling course is required, 1 credit hour of lecture can be dropped without compromising the education of the petroleum engineer. Additionally, this course is then more in-line with the credit hour limits of the other petroleum engineering base classes (ex: completion, stimulation, production, and reservoir engineering).

Updates have been made to contact hours and total weekly meeting hours.

PEGN201: Petroleum Engineering Fundamentals

Changes made to course name and addition of student learning outcomes. Current PEGN102 course is designed for any major and is exceptionally general. This course will now be required in the Petroleum Engineering curriculum and will be offered as a 200-level course. Course number will be changed to 201 at later date. More detailed base-engineering material and starting student understanding of the impact of subsurface resource acquisition impacts on health, environment, security, economics, and sustainability.

A question is asked on the name and course number change to PEGN102 → PEGN201 and if this will affect other departments or students that have this course listed or will take this course in the future. Battalora states that students outside of PE are welcome to take the course, it has only been changed from an elective for PE students to a required course.

Regarding programs that have PEGN102 listed as a required course, the representatives of the affected programs should evaluate whether or not the programs will have an opinion or concern on this change. The content of the course has been improved, but not substantively changed.

An additional question is raised on courses that are offered primarily junior or senior year and how this affects transfer students as they enter Mines. Battalora states positions of courses within student semesters have not been changed yet, as this is the first phase of PE changes.

[status: CIM 12/2; Provost approved: 12/3]

3 new courses: PEGN282: Professional Skills 1
PEGN382: Professional Skills 2
PEGN482: Professional Skills 3

This course provides an opportunity to study professional skills and advance the following Mines@150 skills:

- *Producer of differentiated and highly desired STEM educated leaders through the study of leadership skills*
- *Exemplar for alumni affinity, visibility and involvement through alumni engagement in the course*
- *Educate and empower students for all backgrounds making Mines more attractive to qualified students from all backgrounds (including groups that are currently underrepresented in the Mines' student body)*

A question is asked regarding the addition of the Professional Skills 1-3 courses and whether these have prerequisites or have to be taken in the given order. Battalora confirms that these courses do not have prerequisites and are not required to be taken in the order provided, though it is encouraged.

2.3 MECHANICAL ENGINEERING

Oyvind Nilsen

[status: CIM 1/6]

1 program change: MIN-BMECHE: Minor in Biomechanical Engineering

Proposed change is making CBEN120 optional/elective course with no other changes proposed.

A question is raised on the effect this program change in CBE as all of the bio minors were developed at the same time as the biomechanical minor—will the removal of the Bio 2 course raise an issue with other electives and the programs.

Nilsen states that the understanding of the department was to provide students with more options in having the two remaining courses as obligatory and the biology course as an elective. Nilsen states that, to his understanding, the CBEN120 is not a prerequisite to any of the other classes offered within the program; however, this question will be redirected to the department for additional information.

2.4 ELECTRICAL ENGINEERING and COMPUTER SCIENCE

Jeffrey Paone

[status: CIM 1/6]

1 program change: MIN-RIS: Minor in Robotics and Intelligent Systems

Course updates to provide flexibility and align with robotic knowledge areas.

Paone states that the current minor contains two 400-level CS classes and both of those are expanding to provide students with the flexibility to take one of three.

Major Curriculum Changes

2.10 CIVIL and ENVIRONMENTAL ENGINEERING

Hongyan Liu

[status: CIM 12/18; Provost approved: 12/18]

1 new course: CEEN315: Civil and Environmental Engineering Tools*

This new course introduces students to the tools and vernacular needed to excel in industry.

Depending on the module, the course can be delivered in various modes (in-person, hybrid, remote, or online).

Liu passes the presentation to Holley, a teaching faculty member with CEE.

Holley informs Councilors that this course has been piloted in Fall 2020 and has received positive feedback from students. Originally, the course was delivered from ME and while CEE had an interest there were not faculty to staff available to deliver it. The idea of modularized engineering tools course has been in the works along with the experiments and industry demands that professors were interested in having students learn.

King states that the course was to be presented due to additional edits that needed to be made to the CIM entry. Holley states that the main question had been in regards to credit hours.

The class is presented in 45 +/- minutes with an introduction from the instructor, the remaining two and half hours are for students to be provided lab or studio time. Students are then allowed to work on their exercises and the professor or TA will be available to aid during that time.

This was reflected in the CIM entry as 1.5 credits.

An additional question brought up by the Steering Committee had been whether this course would be a technical elective or free elective, the course is a required class.

Minor Curriculum Changes

The following minor course changes will not be discussed unless specifically requested by Council.

- 2.5 **CIVIL and ENVIRONMENTAL ENGINEERING** Hongyan Liu
[status: CIM 1/6]
1 course change: CEEN311: Mechanics of Materials
Change has been made to the catalog description.
- 2.6 **CHEMISTRY** Dylan Domaille
[status: CIM 12/15]
2 course changes: CHGN336: Analytical Chemistry
Faculty who have taught Analytical Chemistry (CHGN 336) have noticed that students who have not taken Organic Chemistry (CHGN 221) struggle with the course material. The concepts of Thermodynamics (CHGN 209/CBEN 210) are not as heavily used, so the analytical faculty have proposed replacing the thermodynamics pre-requisite with a C- or better grade in Organic Chemistry. The chemistry faculty voted on this change and approved it unanimously with one abstention.
CHGN337: Analytical Chemistry Laboratory
The faculty who teach analytical chemistry have observed that students who have not taken Organic Chemistry (CHGN 221) and its associated lab course (Organic Chemistry Lab I, CHGN 223) struggle with the analytical chemistry laboratory. This change was voted on by the chemistry faculty and approved unanimously with one abstention.
- 2.7 **COMPUTER SCIENCE** Jeffrey Paone
[status: CIM 1/6]
1 course change: CSCI400: Principles of Programming Languages
The catalog description has been updated; CSCI358 has been added as prerequisite for students to strengthen knowledge prior to entering the course and enforce sequence amongst courses.
2 new courses: CSCI295: Industry Exploration I
CSCI395: Industry Exploration II*
Serves as a bridge between Mines and industry partners, faculty and industry partners, and students and industry partners.
***CSCI 395: Typo in contact hours. "Lecture: 0 / Lab: 1"**
- 2.8 **GEOPHYSICS** Ebru Bozdog
[status: CIM 12/16]
1 course change: GPGN455: Earthquake Seismology
GPGN461 remove from prereq list; both 455 and 461 are taught in the same semester and 461 is not necessary for success in 455.
- 2.9 **APPLIED MATHEMATICS and STATISTICS** Karin Leiderman
[status: CIM 12/14; Provost approved: 12/14]
1 new course: MATH470: Mathematical Modeling of Spatial Processes in Biology
AMS has run this course twice as a special topics course (MATH 498/598) and would like to offer it

more regularly.

Curriculum Items in Progress – for vote 1/27/21

- 3.1 **CHEMICAL and BIOLOGICAL ENGINEERING** Michael Barankin
[status: CIM 11/22]
1 program change: BS-CHE: BS in Chemical Engineering
Update to electives, 4+1 courses, and double-counting rules.

Minor Curriculum Changes

- 3.2 **COMPUTER SCIENCE** Hua Wang
[status: CIM 11/12; Provost approved: 11/13]
1 new course: CSCI478: Introduction to Bioinformatics
This is being considered as core course for the new Quantitative Biosciences and Engineering (QBE) program as well as discussion of a new, interdisciplinary undergraduate biological engineering program. Face-to-face interactions are of significant importance to addressing various students' needs.

The undergraduate version will emphasize student hands-on-experience and learning outcomes, students will be able to use computer algorithms to solve biological/medical problems; being able to use programming to solve a problem is the key point.

- 3.3 **GEOLOGY and GEOLOGICAL ENGINEERING** Cheryl Medford
[status: CIM 11/30]
2 course changes: GEGN307: Petrology
When GEGN330 Geoscientists Thermodynamics was added to the GE curriculum and undergraduate program, prerequisites for GEGN307 were not updated. Course syllabus has been added, prerequisites have been updated in order to keep in line with the program. Assures that students that have taken the thermodynamic courses of GEGN330, CHGN209, or MEGN361 can register for the course.
GEGN401: Mineral Deposits
When GEGN330 Geoscientists Thermodynamics was added to the GE curriculum and undergraduate program, prerequisites for GEGN307 were not updated. Prerequisites have been updated in order to keep in line with the program. Assures that students that have taken the thermodynamic courses of GEGN330, CHGN209, or MEGN361 can register for the course. Alternate grade modes have been changed from non-graded to "Standard Letter (A-F, INC).

Plans for the Rest of the Semester

Jeff King

King will be working with Dave on expanding the role of Council and do more than approve courses and programs. This is opened up for discussion and any interest from Councilors.

King asks Councilors if there is any interest in forming ad-hoc subcommittees to discuss any of the three items established by Dave at the beginning of the session.

Ruskell states that the problem with the Final Exam policy is that people believe it is good until it has to be applied, which leads to faculty not following it.

Regarding time spent in class versus outside of class per credit, there is state and federal guidelines established. That number being 2-3 hours, confirmed by Dave. More information on time spent outside of

class is outlined in the Catalog under “Semester Hours”.

Discussion continues on the grading policies at Mines, and the verbiage surrounding those policies.

Adjourn

Meeting adjourned at 5:07pm.

Next Meeting: January 27, 4:00 – 5:00 pm, via Zoom.

Jeff King