

Colorado School of Mines – UNDERGRADUATE COUNCIL MEETING MINUTES
November 11, 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)	A	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	Chuck Stone (PH)		

Other Regular Attendees and Guests

A	Fran Aguilar (MS)	A	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)	P	Karla Perez-Velez (CASA)	P	Katie Ludwin (CASA)
P	Mara Green (AA)						

*Karin Murray, Eliot Kapit, Ethan Lewellin, Melanie Brandt, Toni Lefton

Welcome

Jeff King

Approval of Minutes – January 13, 2021

Jeff King

MOTION: To approve the Undergraduate Council minutes of January 13, 2021 by Barankin; seconded by Liu. 3 abstentions; Barankin, Battalora, Stone. APPROVED.

Briefings and Information Items

- Office of Undergraduate Studies

Vibhuti Dave

No updates from the Office of Undergraduate Studies.

- Registrar’s Office

Paul Myskiw

Myskiw announces the second portion of DegreeWorks, regarding transfer credits, being implemented. This will provide better tools for incoming transfer students to see what courses are applicable so that departments can approve them as appropriate credit. The process is being started with community colleges in Colorado and a few large transfer schools. This will require a month in order to implement, with updates to courses in DegreeWorks.

Myskiw addresses data found in Banner that is being applied to transfer students and asks Councilors if they have an understanding on the history of this data. A grade of TA, TB, or TC was being entered instead of the traditional “T” transfer credit. The Catalog does not make mention of this and Banner transcripts have both the traditional credit and these additional grades.

A process is being considered by the Registrar’s Office for undergraduate students taking 500-level courses; this has been affecting financial aid. Around 300 students are taking graduate level courses for credit, around 50 are taking these for undergraduate credit only and just over 100 are doing this for their dual credit. Consideration has been made to allow seniors to take up to six credits of graduate coursework that may be applied as free electives.

If desired, these can be applied to their major, minor, or certificate and go through the approval process as a substitution. This would allow the RO to award financial aid without issues and have a more open-ended process for seniors.

A question is asked regarding the form being used to promote this process to students, and how it is to be used. Myskiw responds in that it is a 2-page document where students are asked to decipher how they would like the credit applied. The Catalog does not explicitly explain undergraduate students applying graduate credits unless they are pursuing a dual-granting degree. Consideration is being made to adding an approved exceptions list to the Catalog alongside language for undergraduate students adding upwards of 6 hours of graduate-level coursework.

Myskiw updates Councilors on the Fall schedule. Myskiw states that during this time the RO would be soliciting departments on the Fall schedule; however, it is currently unknown the state of the Fall semester in terms of remote or in-person teaching. The Provost is asking for feedback on faculty thoughts of the Fall semester.

Feedback, comments or concerns should be provided to Paul Myskiw with the Registrar's Office regarding Fall scheduling.

Curriculum Items for Council Vote

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

- 1.1 **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.

MOTION: To approve the 1 program change to Chemical and Biological Engineering: Bachelors of Science in Chemical Engineering as championed by Michael Barankin by Barankin; seconded by Lafrancois. No abstentions. APPROVED.

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.

- 1.2 **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.

- 1.3 **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).

MOTION: To approve the 3 minor curriculum items in Computer Science: CSCI478 as championed by Hua Wang and Geology and Geological Engineering GEGN307 and GEGN401 as championed by Cheryl Medford in an omnibus vote by Barankin; seconded by Nilsen. No abstentions. APPROVED.

New Curriculum Items

Major Curriculum Items

2.1 INTERDISCIPLINARY

Eliot Kapit

[status: CIM 1/15; Provost: 1/15]

1 new program: Minor in Quantum Engineering
(requires CIM code assignment)

This internationally distinguished program will differentiate our undergraduates by giving them substantive background in chemistry, computer science, electrical engineering, mathematics, materials science, and physics for quantum computing, communication, and sensing. Students with disparate backgrounds will gain experience with quantum hardware and theory that will prepare them for careers in rapidly evolving quantum engineering industries. This minor will build directly upon the opportunities, infrastructure and industry partnerships that have made the Quantum Engineering MS program so successful in its first year.

Eliot Kapit presents on the new minor in Quantum Engineering. Kapit states that not many people understand quantum mechanics or understand how to do the techniques and there has been critical workforce shortages where a number of people could take these jobs. This will be one of few country-wide quantum engineering programs that will be launching in the following years. There has been increased popularity from undergraduate students.

This will be an 18-credit option with a few courses that have been launched alongside the master's degree and are offered as cross-listed versions for undergraduate students. The new course of Fundamentals in Quantum Information has been taught previously and only requires a linear algebra background; this course is then available to most majors on campus as around half of the students on-campus have taken linear algebra or will take it.

The required courses include Honors Linear Algebra, Fundamentals of Quantum Information, any two of Quantum Programming, Low Temperature Microwave Measurement, Microelectronics Processing, or Quantum Many-Body Physics, plus an additional two electives from a long list of offered courses.

The main participating departments are Physics, Computer Science, Electrical Engineering, Materials Engineering, and Applied Math—students from these departments can add this to their degree if the

credits can be fit.

A question is asked regarding the Honors Linear Algebra and regular Linear Algebra classes having the same content but being delivered differently in pedagogical technique. Kapit states that either course can be offered; the initial process had been that requiring the Honors Linear Algebra would give students better preparation.

2.2 **ENGINEERING, DESIGN, AND SOCIETY**

Carrie McClelland

[status: CIM 1/19]

1 program change: BS-EGN: BS in Engineering

Changing credit hours for EDNS191 to reflect credit hour changes made to streamline equivalencies with EDNS151 and HASS100. Changed program outcomes from ABET a-k to ABET 1-7. Edited the introductory overview to reflect current messaging, grammatical error correction, and provide additional specification (no substantial changes). Changed credit hours required for EDNS191 and EDNS192 to reflect course change requests made to better align with EDNS151/NHV100 which can substitute EDNS191/192 for students who enter the program in their freshman year. Added STEM teaching focus area which is unique to Mines.

McClelland states that the minor changes to the program are in changing the program outcomes from ABET a-k to ABET 1-7. The substantial change arises for students to take both EDNS191 and 192. The courses are similar to EDNS151 and NHV100, but the credits were not matching up between the courses and this has been changed.

The additional teaching focus creates six additional courses that students take to provide them with depth in addition to breadth provided from the other core courses provided.

[status: CIM 1/18]

7 course changes: EDNS191: Integrative Design Studio IA
EDNS192: Integrative Design Studio IB
EDNS291: Integrative Design Studio IIA
EDNS292: Integrative Design Studio IIB
EDNS391: Integrative Design Studio IIIA
EDNS392: Integrative Design Studio IIIB

Course description changes to better reflect course content; no substantive changes to curricula.

Changes have been made to the course descriptions to create a more uniform set-up and be more open-ended.

A question raised by the steering committee was regarding the flow of the Integrative Design Studios. McClelland states that they have been numbered to create a sequence, but many students enter the program as sophomores or juniors. The students are then suggested to take 291, 292 and 391 in any order prior to taking the practicum in 392. Regarding prerequisites for the courses: students are asked to take 191 and 192 or some equivalent prior to the next three studio courses.

The courses have had their designation changed from lecture to studio in order to reflect the course content. For studio classes, the students are in the classroom longer than a normal lab; these studios are recorded in CIM as being 5 credits.

2.3 **GEOLOGY and GEOLOGICAL ENGINEERING**

Bruce Trudgill

[status: CIM 1/20]

1 program change: BS-GLE: BS in Geological Engineering
Program changes reflect updates to the BS curriculum in GE agreed upon by the faculty in the department. The faculty evaluated our program objectives, the sequencing of classes, and the connections among learning outcomes in the 200 and 300-level courses. The outcomes of that analysis include eliminating GEGN206, incorporating select learning outcomes from GEGN206 into GEGN212, adding a new course GEGN217 and reducing credits for GEGN317. New curriculum is the same number of total credits as the current curriculum.

Bruce Trudgill presents to Councilors on the program change. The degree program has been in discussion within the faculty of the department regarding the connectivity between the 200 and 300-level courses. Improvement of has been made to display this connectivity.

GEGN 206 is to be eliminated while incorporating those learning outcomes into GEGN 212. GEGN 217 will be a new field methods class being taught in the sophomore year for students. The field skills are being moved into the sophomore year as to prepare students for the GEGN 317 field camp that is also being proposed.

A question is asked on the offering of the field session being offered in the regular semesters or in the summer. Trudgill states that the course is still offered in the summer; students are in the field for six weeks.

2.4 **ECONOMICS and BUSINESS**

Becky Lafrancois

[status: CIM 1/19]

1 program change: MIN-BUEN: Minor in Business and Entrepreneurship
This edit to the minor adds 3 classes to the list of classes students may choose from to incorporate recent new course additions in Business.

Lafrancois explains that, earlier in the semester, Council had approved new business courses and these have been added to the Minor in Business and Entrepreneurship. Additionally, optional courses such as Intro to Business and Accounting have been added, accounting having not been offered regularly which was why it had not been previously within that optional list.

The Project Management course, approved earlier by Council, has also been added.

2.5 **COMPUTER SCIENCE**

Jeffrey Paone

[status: CIM 1/20]

1 course change: CSCI261: Programming Concepts
Adding CSCI 101 as a prerequisite.

Paone begins by explaining the large evaluation of the entire CS curriculum and looking over how the entire sequence of courses can be organized to provide the best student experience.

Paone states that an early problem identified has been between CSCI 101 and 261 which both, currently, do not have any prerequisites and do not expect students to enter with a knowledge of programming. Content-wise, the courses are teaching the same content with the same material in both courses. More students have been taking CSCI 101 in their Fall freshman semester and moving onto 261 in the spring or in their sophomore year.

Some students have pushed the course into the spring of their senior year, where they are taking the 261 course with first-semester freshman. Providing CSCI 101 as a prerequisite for 261 would create a proper flow and sequence through the introduction of the degree.

There have been discussions across a number of departments that will be directly affected by this change; CS recognizes the effect that this change will have. The course change itself will not activate until Spring 2022. The finalized version of CSCI 261 will be expected Fall 2022.

A question is asked regarding the finalized course changes being in Spring 2022; however, the CIM submission lists an effective date of Fall 2021. However, this change in the prerequisite will affect students that would be taking the CSCI 261 course this coming Fall and have previously taken CSCI 101. Paone states that two formats will be taught in the interim to bridge this change.

A question is asked if there is an option for students of a different department to override this change, as it will add an additional credit for graduation. Paone confirms that there will be a test-out option for proficiency.

A comment is made on students no longer having a three credit Introduction to Programming course under this option, and that campus should continue to have this option as its benefits to students goes beyond CS. Paone states that the Core Curriculum committee has been in discussion regarding this dilemma.

King requests department representatives bring this course change back to their respective departments for discussion and feedback for the next Council meeting (2/10). A request was made for the syllabus of CSCI 261, which has been added to the Council Agenda Items page for review.

2.6 **APPLIED MATHEMATICS and STATISTICS**

Mike Nicholas

[status: CIM 1/18; Provost: 1/19]

1 new course: MATH431: Mathematical Biology

This course will serve as an intermediate modeling course and the capstone (484) will remain as the advanced modeling course. Course number change 331 → 431.

1 deactivation: MATH331: Mathematical Biology

Nicholas explains the renumbering as a means of better reflecting the course content within the course. Some prerequisites have also been added; the AMS department would like to create a modeling sequence for Computational Applied Mathematics majors.

There is MATH 310 which is an Introduction to Modeling that serves as an intermediate modeling course and the capstone would be an advanced modeling course. Addition of prerequisites to the Mathematical Biology course does affect other programs, but Nicholas states that these would be minor affects.

The course is offered as one of twenty possible electives in a handful of minors on campus as well as the Quantitative Biology program.

King requests department representatives bring this course change back to their respective departments for discussion and feedback for the next Council meeting (2/10).

Minor Curriculum Changes

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

2.7 **MECHANICAL ENGINEERING**

Carolyn Freedman

[status: CIM 1/17; Provost: 1/17]

1 new course: AMFG423: Design and Analysis of Experiments

This online course provides innovative state-of-the-art experiment methods to best characterize and

optimize systems/processes in most any domain, though particularly so for Mines@150 S&T frontiers (Materials and Advanced Manufacturing, Earth and Space Exploration/Technology/Engineering, Energy and Water)

This course is cross-listed with AMFG523 and has previously been offered as an AMFG Special Topics Course.

A question is asked regarding overlap with an MME course, and if this is problematic. These questions will be asked offline and addressed at a later time.

2.8 CHEMICAL and BIOLOGICAL ENGINEERING

Michael Barankin

[status: CIM 1/20]

3 course changes: CBEN401: Process of Optimization

Changes to prerequisites; addition of CBEN375 and CBEN402. Removal of CBEN375. This course is a practical follow-up to chemical engineering design, and relies on many of the objectives attained in CBEN402.

CBEN408: Natural Gas Processing

CBEN409: Petroleum Processes

Removal of redundant prerequisites.

2.9 CIVIL and ENVIRONMENTAL ENGINEERING

Hongyan Liu

[status: CIM 1/19]

1 new course: CEEN442: Timber and Masonry Design

Course number change. 440 → 442.

12 course changes: CEEN267: Design II: Civil Engineering

Change to title “Epics II: Civil Engineering” to “Design II”; updates to course description.

CEEN303: Environmental Engineering Laboratory

CEEN401: Life Cycle Assessment

CEEN402: Project Engineering

CEEN406: Finite Element Methods for Engineers

CEEN410: Advanced Soil Mechanics

CEEN446: Structural Loads

CEEN461: Fundamentals of Ecology

CEEN473: Hydraulic Problems

CEEN475: Site Remediation Engineering

CEEN480: Chemical Fate and Transport in the Environment

Editorial changes to responsible faculty and catalog authors as well as syntax; course offering dates.

CEEN411: Unsaturated Soil Mechanics

Department faculty decision to modify CEEN411 Soil Dynamics to CEEN411 Unsaturated Soil Mechanics to match the cross-list with the graduate course CEEN511 Unsaturated Soil Mechanics. CEEN 412 Soil Mechanics will be deactivated.

4 deactivations: CEEN412: Unsaturated Soil Mechanics

CEEN474: Solid Waste Minimization and Recycling

CEEN476: Pollution Prevention: Fundamentals and Practice

CEEN440: Timber and Masonry Design

2.10 COMPUTER SCIENCE

Jeffrey Paone

[status: CIM 1/19; Provost: 1/19]

1 new course: CSCI425: Compiler Design

This course will promote Mines as a producer of high-quality professionals in the field of computer science and a leader in secondary STEM education. This course will be taught using Formal Learning

Groups which promotes collaboration, openness and responsibility. Residential (>50% online) or online. This course can be delivered either 100% online or 100% residential.

- 2.11 **ECONOMICS and BUSINESS** Becky Lafrancois
[status: CIM 1/19; Provost: 1/20]
1 new course: EBGN444: Innovate X
Innov8x fills an entrepreneurship and innovation gap in EB curricula in the area of problem definition: the investigation and framing of a wicked problem in the context of ambiguity, uncertainty, and complexity and hands-on, and the iterative process of solving problems creatively. The course provides professionally oriented pre- and post-graduate education options and is already attracting new students to Mines. It has been piloted using face-to-face, remote, and hybrid modalities expanding the delivery capabilities.
- 2.12 **ENGINEERING, DESIGN, AND SOCIETY** Carrie McClelland
[status: CIM 1/18]
1 course change: EDNS479: Community-Based Research
Pre- and corequisite changes needed to allow graduate students in Humanitarian Engineering and Sciences program to take the course without submitting paperwork with the Registrar.
- 2.13 **GEOLOGY and GEOLOGICAL ENGINEERING** Cheryl Medford
[status: CIM 1/15-20]
2 course changes: GEGN212: Petrology for Geological Engineers
Changes to GEGN212 reflect updates to the BS curriculum in GE agreed upon by the faculty in the department. Outcomes of the analysis include: eliminating GEGN 206, incorporating select learning outcomes from GEGN 206 into GEGN 212, adding a new course → GEGN217 and reducing GEGN 317 credits.
GEGN317: Geologic Field Skills
Geologic Field Methods is moving to Spring of the Sophomore Year (GEGN217). Current GEGN317 needs to be revised and changed to a one-credit class that focuses on developing our GE majors mapping skillset and fully preparing them for GEGN316 (Field Camp).
1 deactivation: GEGN206: Earth Materials
- 2.14 **HONORS** Carrie McClelland
[status: CIM 1/14]
1 course change: HNRS115: Innovation and Discovery in Engineering, Arts, and Sciences II
Changing prerequisites to move on to HNRS115 to a C- or better in HNRS105.
- 2.15 **UNIVERISTY HONORS** Wendy Adams
[status: CIM 1/19; Provost: 1/20]
5 new courses: MAED405: Mathematical Practices and the Social Context of Mathematics
This course provides teacher candidates an opportunity to develop the skills to promote students' mathematical identity and their understand of mathematical practices and processes – mathematics is a community of inquiry – as articulated in the Colorado Academic Standards and Common Core.
MAED425: Pre-Algebra and Algebra Teaching Techniques
In this course teacher candidates will be exposed to evidence-based instructional practices to support students' learning of pre-algebra and algebra and modeling meaningful learning opportunities, common misconceptions and ways of thinking, and students' learning progressions.
MAED435: Computer Science Teaching Techniques

This course provides teacher candidates an opportunity to develop the skills to promote students' computer science (CS) identity and their understanding CS practices and processes – including computational thinking – as articulated in (1) the Computer Science Teachers Association and (2) the Colorado Academic Standards.

MAED464: Capstone Curriculum Design I

MAED465: Capstone Curriculum Design II

This course provides Mines students an intensive teaching experience in a K-12 mathematics or computer science classroom. The goal of this course is for the student to develop and demonstrate competencies in the areas of planning, instructional methods, assessments, creating effective learning environments for all learnings, classroom management and organization, content knowledge, and professionalism.

2.16 MECHANICAL ENGINEERING

Oyvind Nilsen

[status: CIM 1/18]

5 course changes: MEGN200: Introduction to ME: Programing and Hardware Interface

MEGN201: Introduction to ME: Design and Fabrication

MEGN300: Instrumentation & Automation

MEGN301: Mechanical Integration & Design

Add C- to requirements for prerequisites to be consistent with other ME courses.

MEGN412: Advanced Mechanics of Materials

Changes to course description and updates to student learning outcomes. The topic of Elasticity was moved to MEGN510 and changes this course's details.

2.17 METALLURGICAL and MATERIALS ENGINEERING

Corrinne Packard

[status: CIM 1/12]

1 course change: MTGN219: Art and Science of Glassblowing

Changes to course description regarding limited capacity of course.

2.18 PHYSICS

Todd Ruskell

[status: 1/19]

1 new course: PHGN417: Fundamentals of Quantum Information

This course will be part of the new Quantum Engineering minor, and more broadly increase quantum literacy across campus. This is an undergraduate-level version of PHGN519, Fundamentals of Quantum Information. The courses have the same title, catalog description, and textbook. The class meetings themselves will be the same. The undergraduate version will be shorter with less difficult homework assignments.

2.19 UNIVERISTY HONORS

Wendy Adams

[status: CIM 1/19; Provost: 1/20]

6 new courses: SCED333: Education Psychology and Assessment

The purpose of this course is to present this new science of learning so that educators can creatively translate the science into exceptional practice. This course covers field-defining learning theories ranging from behaviorism to cognitive psychology to social psychology and some lesser known theories exceptionally relevant to the practice, such as arousal theory.

SCED363: Dynamic Teaching: Motivation, Classroom Management, and Differentiation of Instruction

The purpose of this course is to prepare future educators to be able to motivate students, manage classroom behavior, and differentiate their instruction so that all students can learn.

SCED415: Scientific Practices vs Engineering Design and the Nature of Science

The goal of this course is to prepare students to integrate knowledge of scientific and engineering practices into their teaching as articulated in the Colorado Academic Standards and the Next Generation Science Standards, including asking questions, defining problems, developing and using models, planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, engaging in argument from evidence, obtaining, evaluating and communication information.

SCED445: Physics and Chemistry Teaching Techniques

In this course students will engage as learners of physics and chemistry through evidence-based teaching strategies. After each unit of instructions, students will reflect on the practices used during the unit and why these practices were effective techniques for teaching science.

SCED464: Capstone Curriculum Design I

SCED465: Capstone Curriculum Design II

This course provides Mines students an immersive teaching experience in a K-12 science, engineering, or STEM classroom. The goal of this course is for the student to develop and demonstrate competencies in the areas of planning, instructional methods, assessments, creating effective learning environments for all learners, classroom management and organization, content knowledge, and professionalism.

Curriculum Items in Progress – for vote 2/10/21

Major Curriculum Changes

3.1 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.*

3.2 PETROLEUM ENGINEERING

Theresa Snyder

[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.

[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.

Battalora adds that there has been discussion with Chemical Engineering and the energy minor that would be affected by this course change—agreement has been had that there is not any controversy.

[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)*

3.3 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.

Nilsen updates Councilors that there have been 11 students over the last four semesters that have been taking this minor.

Barankin provides feedback from the Chemical and Biological Engineering department from 2-3 faculty that teach Anatomy and Physiology and have mentioned that Bio II is offered twice a year whereas A&P is not. The topics covered are similar in that coverage is over mechanics of the human body and mechanics of living beings. Barankin asks the potential of a student receiving this minor without any understanding in anatomy and physiology; if these students would not have a biology course or anatomy and physiology required as a course and receive a minor in biomechanics without the mechanics courses provided.

Nilsen responds in that there are twenty different courses outside of the required courses that provide options to students. Nilsen states that contact can be made with the biomechanics professors to adjust or

respond to this feedback.

- 3.4 **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.
- 3.5 **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).

Minor Curriculum Changes

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

- 3.6 **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.
- 3.7 **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.
- 3.8 **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"**

- 3.9 **GEOPHYSICS** Ebru Bozdag

[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.

3.10 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.

Changes to Honors Catalog Language

Melanie Brandt

Toni Lefton

- McBride Cumulative GPA 2.9→2.7
 - This has been updated to include language “Exemptions may be granted at the discretion of the program director”. GPA numerology is not being changed within the Catalog.

Lefton explains that the cumulative GPA requirement for a minor at Mines is 2.0. Due to the events over the past semesters; due to COVID-19 and stressors there have been a number of strong McBride students whose cumulative GPA has dropped into the lower range of 82%. These cases do happen, but not frequently.

The McBride Honors Program proposes lowering the minor program’s cumulative GPA from 2.9 to 2.7.

Brandt explains that, for the courses, the GPA requirements will remain the same. This change is to ensure that students who are high-performing but have fallen behind are still being honored and awarded with the degree that they have earned despite outstanding circumstances.

A comment is made regarding the possibility to carve out expectations for individual students such as these without altering the cumulative GPA language entirely. Lefton responds that if this information is codified in the Catalog it must be followed, additionally the cumulative GPA for minors was established prior to Mines’ plus/minus grading system which some faculty honor and others do not.

A comment is made on encouraging students that have a sub-3.0 GPA to focus on increasing their GPA rather than pursuing an additional minor in terms of employability in their field. Lefton responds that, given the nature of the program and the community, being a part of the program improves a student’s overall performance over time. Brandt expands on results of alumni that have graduated with the McBride program having improved employability due to a minor in Public Affairs with honors distinction.

A question is then asked if employers are currently using GPA cut-offs at Career Fairs, Myskiw responds that he is currently unaware of any GPA cut-offs as of the current date 1/27.

King suggests moving these requirements into a program document that would state admission requirements must meet requirements established by the Honors program; which would provide additional flexibility to the program. This language could also be placed in the Catalog for the Honors program having the ability to waive these requirements for special cases rather than fine-tuning the GPA.

Adjourn

Jeff King

Meeting adjourned at 5:02pm.

Next Meeting: February 10, 4:00 – 5:00 pm, via Zoom.