# Colorado School of Mines – FACULTY SENATE MEETING MINUTES
## February 28, 2:00 – 4:00 pm, Zoom Only

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**Attendees:**
**Voting Members**: 15 total (8 needed for quorum). Quorum was present.

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| P | Jeff King (Chair) | P | Cristian Ciobanu (ME) | A | Linda Figueroa (CEE/MN) | P | Joseph Horan (HASS) |
| P | Mark Eberhart (CH) | A | Brandon Dugan (GP)* Sabbatical Spring 2023 | P | Mansur Ermila (PE) | P | Cynthia Norrgran (CBE) |
| P | Bettina Voelker (CH) | A | Lawrence Wiencke (PH) | P | Pat Kohl (PH) | P | Ventzi Karaivanov (ME) |
| P | Sid Saleh (EB) | P | Deb Carney (AMS) | P | Soutir Bandyopadhyay (AMS) | | |

**Other Regular Attendees and Guests**

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| P | Andrew Herring (AA) | P | Rick Holz (AA) | P | Paul Myskiw (RO) | A | Colin Terry (Student Life) |
| P | Sam Spiegel (Mines Online) | P | Emmelia Ashton (USG) | A | Liam Witteman (GSG) | A | Mara Green (AA) |
| P | Vibhuti Dave (UGS) | P | Tim Barbari (OGS) | P | Lori Kester (EM) | P | Nicole Becwar (LB) |
| P | Karla Perez-Velez (CASA) | P | Deb Jordan (Trefny) | A | Jen Gagne (Graduate Admissions) | P | Terri Hogue (Dean) |
| P | Todd Ruskell (PH) | | | | | | |

**Special Guest(s):** Jason Slowinski (Associate Vice President; Infrastructure & Operations), Scott Houser (EB), Hisham Sager (EE), Rob Thompson (CS), Hsia-Po Vince Kuo (PH)

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**Welcome**                                                                                         Jeff King

**Approval of Minutes** (February 14, 2023) and **Adoption of Today's Agenda**          Jeff King

**MOTION**: To approve the Faculty Senate minutes of February 14, 2023 by Horan, seconded by Ermila. Motion passed unanimously.

**MOTION**: To adopt the February 28, 2023 agenda by Voelker, seconded by Horan. Motion passed unanimously.

**Academic Affairs Announcements**                                                          Rick Holz
Holz reported the first round of exams have begun; the common exam for general chemistry occurred 2/27. The first, large round of midterm exams are coming up. Issues had not been reported from faculty or students.

Holz reminded faculty the Higher Learning Commission (HLC) visit is scheduled for 3/13; the schedule for the visit will be provided once available.

The Entrepreneurship and Innovation (E&I) group held a showcase 2/23 that had been well attended, including alumni attendees. Presentations were provided by small business entrepreneurs.

**Registrar's Office Announcements**                                                         Paul Myskiw
Myskiw sent an email to faculty asking faculty review of advisee lists; Myskiw asked Senators to bring the information back to departments for faculty review. Myskiw reported having only heard back from three faculty.

Summer and fall registration scheduled for 4/3. Myskiw, Dave, and Kester have been working with marketing and communications to bolster summer offerings with hope to begin advertising in the following week through the start of summer to increase summer enrollment.

**Committee Reports**

<u>Bylaws and Rules</u>                                                                                      Jeff King
Faculty Senate Ad Hoc Committee
Committee met once since the 2/14 meeting. Committee coalescing a recommendation for a two-year presidency and consideration of a larger Senate body.

<u>Core Curriculum</u>                                                                                      Vibhuti Dave
Faculty Senate Ad Hoc Committee
Dave presented on the revised core curriculum Catalog language.

The language included a preamble with the definition and purpose of the core curriculum alongside a link to the core competencies approved in 2021. The five different categories that core course fall into are listed and described in the language. The five categories include: Math, Basic Sciences, & Computing; Design and Innovation, Humanities, Business, Arts & Social Sciences (Dave reported this name is a placeholder and may change with input from stakeholder departments, this category was previously called H&SS), Success & Wellness (S&W) and Student Led Inquiry. The name change of H&SS was considered due to confusion between the department of HASS and H&SS as well as the desire to expand the electives that could be placed within the category.

The language included a statement to encourage students to complete the core course requirements and complete the requirements on time, in accordance with the schedules provided by the degree program.

A table was included with the different core courses and number of credits associated with the courses.

The language included boundary conditions associated with H&SS electives. Dave reported there had been questions raised by CASA and the language may be cleaned up further; Dave noted that should the H&SS electives be expanded the boundaries may change, as well.

*Math, Basic Sciences, & Computing*
The bucket was outlined in the language with how many credits are expected alongside a table of the courses: MATH111, MATH112, MATH213, a fourth math specified by the degree, CHGN121, PHGN100, and CSCI128.

*Design and Innovation*
The bucket included EDNS151.

*Humanities, Business, Arts & Social Sciences*
Dave reminded faculty the name may change with stakeholder department input. The courses included in the bucket were: HASS100, HASS200, EBGN201, Mid-Level electives, and senior seminar electives. Dave noted HASS100, HASS200, and EBGN201 would remain in the Catalog until the CASES/STFutures course was finalized after having been piloted Fall 2023. A list of H&SS electives, copied from the current Catalog, were included in the language. The taskforce recommended EBGN230 and EBGN444 be included in the list of electives; the discussion between H&SS departments was reported as ongoing.

*Success & Wellness*
The bucket included CSM101, CSM202, and Success and Wellness electives. A list was provided of the proposed S&W electives including: CSM250, CSM275, CSM350, and any one credit PAGN2XX course. Dave reported a proposal to include CSM120: Introduction to Technical Writing to the list of S&W electives, this decision to include the course would be contingent on Undergraduate Council.

*Student Led Inquiry*
The bucket included six credits of free electives.

The taskforce proposed language for an appendix of the revised core to provide space for any additional changes in future Catalogs. A table had been included to display the current core, the proposed core, and what ideal implementation would look like. Dave reported concern had been raised by the H&SS departments on having a third column including the ideal implementation as it may confuse students or students may put off taking courses. Dave noted feedback on the appendix was encouraged.

The proposed Catalog language included guidelines for incoming and continuing students. Incoming students are encouraged to follow degree flowcharts and ensure requirements are completed. Continuing students can switch from their admission year Catalog to the new Catalog. The guidelines were in place to provide transparency of changes and how the changes impact students. The guidelines were created to aid in meaningful conversations with CASA advisors and faculty mentors.

Dave noted visuals are present in the document, but may not appear due to the software used for Catalog publication.

Computer Science helped in articulating how students can complete their CS requirements and what options are available if students had taken CSCI101 and CSCI102, and if there is intent to switch Catalogs.

*Core Curriculum Resolution*
Dave reported on how the core changes reflect what had been approved by Faculty Senate in the core curriculum committee resolution approved in October 2022 (click here for the resolution). Dave reported all items listed in the resolution had been accomplished. Dave noted that should the language presented be approved, programs can move forward in integrating the changes into degree programs. The distributed science electives have not been included in the revised language and would be absorbed by the degree programs.

Resolution 2.f and 2.g are still in progress. These two resolutions include the development of a new, three credit interdisciplinary course to replace HASS200 and EBGN201 and the resignation of humanities and social science electives. Dave recommended invitation of the H&SS department heads for a future Senate meeting to provide an update on the plan of action and timeline for accomplishing resolutions 2.f and 2.g.

Dave reported a plan is in place to assess the core. Faculty teaching core courses would be gathered over summer to develop and assessment plan of the core curriculum.

Degree programs have begun revision of their degree plans and flowcharts. Submission of the program changes to the Curriculum Inventory Management (CIM) system due 3/1. Dave noted the changes are contingent on the approval of the Catalog language.

The discussion of resources had been resolved by CS and AA with an update needed from H&SS.

- **Question** if there is an opportunity to run analyses of what may happen with a new core curriculum; Myskiw reported there is an option to run scenarios using Degree Works' audit. Myskiw noted with wholesale changes of the core there is a push to do no harm to current students and provide flexibility for current students over the remainder of their academic career at the institution.
- **Question** if the changes presented are finalized and if there is no longer an opportunity to reconsider other items; King noted Senators can add amendments.

Senator noted the previous revision of the core curriculum involved the whole faculty with multiple faculty forums and detailed discussions. Senator reported department concerns with separating Chem I and II when the courses are structured in a sequence. Senator reported faculty forums were held in Fall 2022. An extensive survey of department heads was completed alongside attendance of several department head meetings; course coordinators were spoken with. Dave reported degree programs have the right to choose whether to keep Chem II in their curriculum; the committee removed the boundary conditions requiring degree programs to have three of the five distributed science elecitves.

Senator made note that detailed, fleshed out materials has not been provided to Senate. Dave reported the details for CSCI128 were presented to both Undergraduate Council and Senate, and a report from Student Life was scheduled for a future Senate meeting. Senate discussed the CS department consideration for piloting CSCI128; Dave reported having met with Provost Holz, Iris Bahar, and John Berger on full launch of CSCI128 for Fall 2023.

Senate agreed a revision of the core should benefit the students; Senator noted there should be a measure of student satisfaction. Dave reported there is a student representative on the Board of Trustees; the student voiced excitement for computing within the core and the new H&SS course. Faculty members had also shared the new core in their classrooms and feedback was positive. Senator noted there had been limited student feedback across the campus. Senator reported there is a resistance to change within the departments.

Senator suggested proposal of a core assessment committee to review the core moving forward and bring student viewpoints. The core curriculum committee decided to not complete a broad campus-wise survey of the students in advance.

<u>Faculty Contracts</u>                                                                                                Todd Ruskell
Faculty Senate Ad Hoc Committee
No new updates from the Faculty Contracts committee.

<u>Online Standards</u>                                                                                          Ventzi Karaivanov
Faculty Senate Standing Committee
Committee met two weeks prior for the first time in the Spring 2023 semester. The committee had reviewed ten courses thus far for the academic year with more expected. Karaivanov reported reviews take less than a week. The committee had been asked to provide feedback on courses.

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Committee to work on projects over the remainder of the semester including reviewing the Academic Calendar and how it matches with online courses and if some dates can be improved. Committee working on transition plans into the next year.

**Council Reports**

Undergraduate Council

Horan recommended Senators review the four memorandums distributed by Student Life on related core curriculum items: updating PAGN and CSM courses from half credit to one credit, the introduction of CSM202 as a required course, and the Success and Wellness (S&W) courses.

Graduate Council

No reports from Graduate Council.

Research Council

Saleh reported Seth Vuletich would chair the Excellence in Research Awards Research Council committee.

**Briefings, Informational Items, and Updates**

Higher Learning Commission Presentation                                             Andy Herring

Herring encouraged Senators to attend the Zoom townhall on 3/2. Herring noted an agenda had not been provided by the HLC auditors.

Herring reported every university in the country is accredited by a regional accreditor; Mines' regional accreditor is the Higher Learning Commission (HLC) alongside eighteen states. HLC audits every decade. HLC scheduled to visit Mines 3/13 and 3/14 to meet with the President, the chair of the Board of Trustees, one or two other Trustees, and three forums would be held.

One forum would go over mission, ethics, integrity, and shared governance. The other forum will be on learning and outcomes. The third open forum would be on operation and the strategic plan, Mines@150. These would be held in the Ballrooms, one hour each (click here for more information on the open forums). The AA site hosts information on the previous accreditation.

Parking Update                                                                         Jason Slowinski

Slowinski presented the current parking portfolio at Mines; Slowinski reported 3,640 total parking spaces and thirty distinct parking lots or structures. Slowinski noted there had been several challenges and frustrations reported on parking and provided an overview of the strategy of Mines moving forward.

Parking permits are priced differently and permissions are spread across campus for maximum use and efficiency. Parking service groups regularly collect data on lot capacity; Mines operating at one hundred percent capacity particularly on Tuesdays, Wednesdays, and Thursdays between 10am and 3pm. Blue lots are operating at one hundred percent capacity and effort is made to not oversell these areas. The amount of spaces has been reduced over time. Slowinski noted there is an orange lot for contractor parking for contractors working on larger projects; it had been found that contractors are using spaces outside of the contractor areas.

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Slowinski reported parking fees are set each academic year with the following in mind: the impact of the fee to overall cost and experience of students, faculty, employees, and visitors on campus; ensuring an efficient and effective strategy for parking on campus; long-term financial sustainability to the parking auxiliary fund; the ability to fund needed capital improvements to parking lots and structures; market expansion of Mines parking rates to other areas universities; and achieving Mines@150 goals and objectives.

Slowinski reported current factors in current parking challenges include higher demand than supply, campus construction projects, expansion of city parking regulations, and recovering from reduced parking during the peak of the COVID-19 pandemic. The city of Golden has expanded regulations around campus; there had been an increase in two-hour zones. Areas outside of campus boundaries are no longer available to students.

Slowinski presented parking strategies for the next six to twelve months and long-term. Short-term strategies included implementation of a staff and faculty RTD EcoPASS beginning January 2023, implementation of temporary parking alternatives to increase supply for Spring and Summer 2023, launch of a campus shuttle program beginning June 2023, and reduction of freshman parking for Fall 2023. Long-term strategies included construction of an 870+/- space parking garage at 17th & Arapahoe, new lot names and identifiers; new consistent, Mines branded signage, and parking sensors with an app to quickly identify open spaces.

The RTD's EcoPASS program would be free to all full-time and part-time faculty and staff. The EcoPASS offers unlimited rides on all RTD buses and trains at anytime with 24/7/365 access without exclusions.

The campus shuttle program would be free to all riders providing a faster service than the MINES Rover with established routes and ten to fifteen-minute service times. The shuttle program would be able to accommodate ADA service requests. The launch date is expected on or before Fall 2023 with a service schedule of weekdays 7am-7pm and Saturday midday. Services to Mines Park, outlying parking lots, Central campus, the Athletics complex, Safeway, downtown Golden, and RTD 'W' Line.

**Confirmations and Appointments**                                                  Cristian Ciobanu
Senate Representative to Handbook Committee
Eberhart had the bandwidth to serve as representative on the Handbook Committee. Horan confirmed Handbook committee meetings are Wednesdays from 4pm to 5pm. Holz noted there are some meetings from 3pm to 5pm given the amount of work done over the semester.

**MOTION**: To establish M. Eberhart as Faculty Senate representative on the Handbook committee by Ciobanu, seconded by Horan. Motion passed unanimously.

Faculty Workload Ad Hoc Committee
Tabled.

**Undergraduate Council**                                                            Joe Horan
CORE Undergraduate Curriculum Items for Senate Vote – Appendix A
*1.1 Program change to BS in Computer Science*
CS presented restructuring of their course flowchart in accordance with the core discussions.

*1.2 Core course changes to PHGN100 and PHGN200*

PHGN100 and PHGN200 were decreased from 4.5 credits to 4.0 credits.

*1.3 Program change to BS in Electrical Engineering*
The program changes presented included removal of the program emphasis areas and restructuring of the program course flowchart with the core revision.

**MOTION**: To vote to approve the Appendix A items 1.1, 1.2, and 1.3 in an omnibus Senate vote by Horan, seconded by Voelker. Motion passed unanimously.

Non-CORE Undergraduate curriculum Items for Senate Vote – Appendix B
*2.1 Program change to BS in Applied Mathematics and Statistics*
*2.2 Program changes to the Minor in Computer Engineering, Minor in Data Science, Minor in Robotics and Intelligent Systems, and Minor in Computer Science*
*2.3 Program change to the BS in Business Engineering and Management Science*
*2.4 Program change to the Minor in Leadership and Social Responsibility*
*2.5 Program change to the BS in Quantitative Biosciences and Engineering*

**MOTION**: To vote to approve Appendix B items 2.1 through 2.5 in an omnibus Senate vote by Horan, seconded by Voelker. Motion passed unanimously.

**Graduate Council**                                                                                     Tina Voelker
Graduate Curriculum Items for Senate Vote – Appendix D
*4.1 New Non-Thesis Master's program in Applied Physics*
*4.2 Program change to MS (with thesis) & PhD – Physics*
*4.2 Program change to MS & PhD – Applied Math/Statistics*

**MOTION**: To vote to approve Appendix D items 4.1 through 4.2 in an omnibus Senate vote by Voelker, seconded by Ermila. Motion passed unanimously.

HLC Assumed Practices – Proposed Catalog Language from 2/14/23
The presented language would allow Mines' double-counting language to fall in compliance with HLC Assumed Practices. The document assumes double-counted courses counted toward the graduate degree are graduate-level courses. Voelker noted the main challenge would be advising students going into combined programs to take 500-level courses rather than 400-level with the intent on double-counting.

The language had been discussed in Graduate Council with proposed changes from Council. The language assumes time to adjust to the new double-counting proposal.

**MOTION**: To suspend the two-meeting rule to vote on the proposed Catalog language by Voelker, seconded by Horan. Motion passed unanimously.

**MOTION**: To vote to approve the proposed Catalog language by Voelker, seconded by Saleh. 9 for, 1 against. Motion passed.

Graduate Curriculum Items for Senate presentation – Appendix C
*3.1 Program change to MS & PhD in Earth Resources Science and Engineering*

The change proposed including both science and engineering majors in the degree, not only engineering. The proposed change included the name changed from Earth Resources Development Engineering to Earth Resources Science and Engineering.

*3.2 Program change to MSPHDCERT in Analytical Geochemistry*
Electives were updated.

*3.3 Program change to MP, MS, & PhD in Geophysics & Geophysical Engineering*
Updates were made to the prescriptive electives to allow greater flexibility to students.

*3.4 Program change to MS & PhD in Quantitative Biosciences and Engineering*
QBE updated their electives course list.

*3.5 Program change to MS & PhD in Electrical Engineering*
EE updated the names of their technical electives.

*3.6 Program change to MS & PhD in Materials Science*
The program's electives are not limited to MLGN prefix courses; it was noted this was not a change in practice.

*3.7 Program change to MS & PhD in Mechanical Engineering*
MECH had updated their list of approved Research Core courses to ensure all courses can be taught for students to be taught on time.

**Open Floor**                                                                                      Jeff King
King noted there are two upcoming meetings in March 2023 with several voting items for the core curriculum; King would like to ensure all have the opportunity to speak and express their opinions during meetings. King asked Senators bring forward concerns of limited discussion on one or more topics. The option to hold an additional business meeting for formal business items or an unofficial working meeting for further discussion is available.

**Adjourn**                                                                                         Jeff King
Meeting adjourned: 3:47 pm.
Next meeting: March 14, 2:00-4:00 pm in the Guggenheim Boardroom and Zoom Webinar. Please send all agenda items 1 week prior to Mara Green (mgreen1@mines.edu).

**APPENDIX A**
***CORE Undergraduate Curriculum Item(s) for Senate Vote*** from 2/14/23

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1.1        **COMPUTER SCIENCE**
[CIM 1/4; UGC 2/1]
**1 program change**:     BS-CS: BS in Computer Science
*Restructuring degree to align with new Mines Core curriculum.*

1.2        **PHYSICS**
[CIM 1/16; UGC 2/8]
**2 core course changes:**  PHGN100: PHYSICS I – MECHANICS
                             PHGN200: PHYSICS II – ELECTROMAGNETISM AND OPTICS
*PHGN100 & 200 reduction of credits from 4.5 to 4.0. Has been approved by the Physics Department Undergraduate Council and by the Physics Department Faculty. This is part of the revision of the core curriculum.*

1.3        **ELECTRICAL ENGINEERING**
[CIM 2/8; UGC 2/22]
**1 program change:**     BS-EE: BS in Electrical Engineering
*Electrical Engineering Department - Emphasis Area Removal*
*An analysis of the emphasis areas within the department reveals that approximately 70% of our students do not select an emphasis area and instead pursue our general electrical engineering program. Supporting these emphasis areas places a high teaching demand on our small faculty. The department unanimously supports the removal of emphasis areas. Emphasis areas will be converted to pathways for students to identify specialty areas for study.*
*Updates to flowchart to reflect core revision.*

**APPENDIX B**
***NON-CORE Undergraduate Curriculum Item(s) for Senate Vote*** from 2/14/23

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2.1 **APPLIED MATHEMATICS & STATISTICS**
[CIM 12/14; UGC 2/1]
**1 program change**: BS-AMS: BS in Applied Mathematics and Statistics
*This is a small change for the Computational and Applied Math major. We are adding MATH324 to the list of required courses and removing MATH335 from that list. The feeling is that if a CAM major takes just one of these, MATH324 is more practical. We will include MATH335 on the elective list.*

2.2 **COMPUTER SCIENCE**
[CIM 1/4; UGC 2/1]
**4 program changes**: MIN-COMPE: Minor in Computer Engineering
*Adding new CSCI 210 Systems Programming course to list of courses*
MIN-DSCI: Minor in Data Science
*Updating responsible faculty. Add CSCI 478 Bioinformatics to list of courses*
MIN-RIS: Minor in Robotics and Intelligent Systems
*Replace Intro to Stats with Intro to Prob*
MINASI-CS: Minor in Computer Science
*Deactivating ASI. Currently zero students enrolled and ASIs are rarely utilized across campus. Further, due to prereqs a student completing the existing ASI would need 1 more course to complete the minor. Second version of minor being rolled into Minor in Computer Engineering.*

2.3 **ECONOMICS AND BUSINESS**
[CIM TBD; UGC 2/1]
**1 program change**: BS-BEMS: Business Engineering and Management Science
*The data science and business analytics core for the BEMS degree was originally constructed with classes that already existed in the Department of Economics and Business or elsewhere on campus. Now that the department has additional faculty depth in business analytics, the department wants to make sure that it is providing our students with the sequence of courses that will best serve their needs. Course proposals for the classes below have been submitted to CIM, and once those are approved, the program changes will be submitted to CIM.*

2.4 **ENGINEERING, DESIGN, AND SOCIETY**
[CIM 12/21; UGC 2/1]
**1 program change**: MIN-LSR: Minor in Leadership in Social Responsibility
*Update to course elective list for LSR minor. The Engineering for Community Development HE minor in EDS also lists elective courses which should be consistent between the two offerings.*

2.5 **QUANTITATIVE BIOSCIENCES AND ENGINEERING**
[CIM 12/15; UGC 2/1]
**1 program change**: BS-QBE: BS in Quantitative Biosciences and Engineering
*Update to technical electives list. Requested by L. Salinas 12/14/22*
*Updated field session placeholder in Summer Junior year - MG 12/15/22*

**APPENDIX C**
***Graduate Curriculum for Senate Presentation***

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3.1 **MINING ENGINEERING**
[CIM 1/17; GC 2/15]
**1 program change**:     MSPHD-ERSE: Earth Resources Science and Engineering

*Dept of Mining engineering offers MS and PhD degrees under Earth Resource Development Engineering (ERDE). This program allows faculty in our dept to recruit and advise students from various engineering backgrounds to work on mining and minerals related topics. There has been much demand and inquiry to allow students with science background to join the program and work on these topics. ERDE by nature is multi-disciplinary and we are opening it to the possibility of having students with Science background to join the program. With this change, we are also proposing to change the name of the program to "Earth Resources Science and Engineering (ERSE)".*

*In brief this program change involves:*
*- Change the requirements for ERDE admission so that students from non-engineering backgrounds can also be admitted without having to fulfill the requirements for an engineering undergraduate degree*
*- Change the name of ERDE – Earth Resource Development Engineering to ERSE Earth Resources Science and Engineering*

3.2 **CHEMISTRY**
[CIM 2/10; GC 2/15]
**1 program change**:     CRTG-GE: MSPHDCERT – Analytical Geochemistry

*This submission reflects only program elective updates and the removal of an outdated sentence. Specifically:*
*Master of Science and Doctor of Philosophy*
*Geochemistry Degree Track*
*MS Course List*
*Reordered list for ease of reference*
*Removed GEOL 535 Litho Ore Forming Processes, as the course is no longer being offered.*
*PhD Course List*
*Reordered list for ease of reference*
*Removed GEOL 535 Litho Ore Forming Processes, as the course is no longer being offered.*
*Environmental Biogeochemistry Degree Track*
*Reordered course list for ease of reference*
*Under 4. One Earth Science-Focused class,*
*Added GEGX 571 Geochemical Exploration*
*Graduate Certificate of Analytical Geochemistry*
*In the Electives list:*
*Reordered the list of ease of reference*
*Added CEEN 562 Environmental Geomicrobiology*
*Professional Masters in Environmental Geochemistry*
*Removed a sentence about requiring 1 lab course—this is a vestigial sentence mistakenly missed during a prior year's edit.*
*In the Electives list:*
*Added CEEN 562 Environmental Geomicrobiology*

*Removed GEOL 535 Litho Ore Forming Processes, as the course is no longer being offered.*
*Added GEGX 571 Geochemical Exploration*

3.3 **GEOPHYSICS**
[CIM 1/10; GC 2/15]
**1 program change**: MPMSPHD-GP: MP, MS & PhD – Geophysics & Geophysical Engineering

*The structure of the GP graduate degrees is currently over-prescriptive in the courses required to satisfy the three presently listed coursework focus areas of theory, applied and computation. This structure also appears to downplay the importance of the "Earth and Space" focus area by not required such coursework in the GP graduate degree programs. We are seeking a programmatic change that affords GP graduate students (and their committees) a greater flexibility in choosing the courses to fulfill their GP graduate degree program and is better tailored to our student's specific research and career goals. We are also looking to rebalance the degree emphasis by requiring coursework in the "Earth and Space" focus area in addition to the three others identified above. These modifications are consistent with the recent broadening the scope of the departmental research and teaching activities over the past few years. In addition, through this programmatic change the GP Department will be expanding the offerings and diversifying the delivery of GP graduate program available to students, which is consistent with the stated Mines@150 goals.*

3.4 **QUANTITATIVE BIOSCIENCES AND ENGINEERING**
[CIM 2/13; GC 2/15 Consent Agenda]
**1 program change**: MSPHD-BIO: MS & PHD – Quantitative Biosciences and Engineering
*This update is to add existing courses to the QBE Elective course list.*

3.5 **ELECTRICAL ENGINEERING**
[CIM 1/25; GC 2/1 Consent Agenda]
**1 program change**: MSPHD-EE: MS & PhD – Electrical Engineering
*Renaming Technical electives.*

3.6 **MATERIALS SCIENCE**
[CIM 2/13; GC 2/15 Consent Agenda]
**1 program change**: MSPHD-MATSCI: MS & PhD – Materials Science
*This update is to clarify that electives need not be limited to MLGN prefix courses. This is not a change in practice.*

3.7 **MECHANICAL ENGINEERING**
[CIM 12/13; GC 2/15]
**1 program change**: MSPHD-MECH: MS & PhD – Mechanical Engineering
*Updating list of approved Research Core Courses to ensure that enough courses are taught so that students can graduate on time.*

**APPENDIX D**
***Graduate Curriculum for Senate Vote*** from 2/14/23

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4.1 **PHYSICS**
[CIM 12/13; Provost 12/13; GC 1/18]
**1 new program**: MSNT-PH: Master of Science (non-thesis) Applied Physics Addition

*The addition of a non-thesis MS program to our Physics program aligns with the goals of Mines at 150, in particular*

- *Be a top-of-mind and first-choice university for students, public and private partners, and faculty and staff.*
- *Expand offerings and diversify delivery, in particular for professionally oriented pre and post graduate education.*
- *Grow the scale and impact of research, focus on thematic strengths, develop a more social research culture, diversity funding sources.*

*The non-thesis program can offer our combined students a more accessible method to get a MS degree in Applied Physics*

4.1.1 [CIM 12/13; GC 2/1]
**1 program change**: MSPHD-PH: MS (with thesis) & PhD – Physics

*Our new Graduate laboratory course is designed to provide first year graduate students with introductory skills necessary to carry out research in discipline specific laboratories – both in the physics department and post-graduate career industrial settings. Graduate laboratory is one step toward the goal of modernizing the Physics graduate curriculum, both content and pedagogy, and to target requirements of employers. In this effort, Classical Mechanics has been partially 'absorbed' into the other four core courses: Quantum Mechanics, Electricity and Magnetism, Statistical Mechanics, and Mathematical Methods. These four courses are, in turn, being integrated to avoid artificial siloing of information. In addition to providing students a rich, interactive learning experience, the new graduate laboratory course is intended to grow the scale and impact of research at Mines. Engaging first year graduate students in real-world research will better prepare them to join broader research communities and contribute at an earlier stage in their careers. Success of the revised physics graduate curriculum will further Mines' goal to be a top-of-mind and first-choice university for students, public and private partners, and faculty and staff.*

4.2 **APPLIED MATHEMATICS & STATISTICS**
[CIM 12/12; GC 2/1]
**1 program change**: MSPHD-AMS: MS & PhD – Applied Math/Statistics

*AMS recommends to revise the CAM graduate core coursework by removing MATH 515 from the required core coursework, instead offering 515 as one of the electives students may choose to take, and adding MATH 501 to the required core coursework. This will ensure that all CAM graduate students have a well-rounded theoretical skillset to complement their skills in mathematical modeling, calculations, and numerical methods.*

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