Colorado School of Mines – GRADUATE COUNCIL MEETING MINUTES
March 1, 4:00 – 5:00 pm, via Zoom

Attendees:

Voting Members: 23 total (12 - majority needed for quorum). Quorum was present

P	Bettina Voelker (Chair)	P	Christine Baker (LB)	P	Andy Osborne (NSE)	P	Owen Hildreth (ME)
P	Eric Anderson (HSE)	P	Soutir Bandyopadhyay (AMS)	A	Jamal Rostami (MN)	P	Michael Heeley (EB)
P	Jeffrey Shragge (GP)	P	Juan Lucena (EDS)	A	Jim Ranville (GC)	A	Luis Zerpa (PE)
P	Kester Clarke (MME)	P	Uwe Greife (PH)	P	Danica Roth (GE)	P	Dong Chen (CS)
P	Jay Straker (HASS)	P	Dave Marr (CBE)	P	Liam Witteman (GSG)	P	Lori Tunstall (CEE)
P	Christine Morrison (CH)	P	Atef Elsherbeni (EE)	P	Gabriel Walton (UCTE)		

Other Regular Attendees and Guests

P	Tim Barbari (OGS)	P	Carolyn Freedman (OGS)	A	Jenny Briggs (OGS)	A	Mara Green (AA)
A	Wendy Adams (HNRS)	A	D. Scott Heath (RO)	A	Paul Myskiw (RO)	A	Roxane Aungst (OGS)
A	Sam Spiegel (Mines Online)	A	Suzanne Beach (Payne)	P	Jen Gagne (Grad Admissions)	P	Kendra Stansbury (RO)

Special Guest(s): Wendy Zhou (GE), Mary Doherty (GE)

Welcome Tina Voelker

Briefings and Information Items

Office of Graduate Studies Tim Barbari

Barbari reported questions were raised on deadlines for August checkout and early Fall checkout, decision had been made to merge the two dates as they were close together; early fall checkout is then eliminated. The dates will be earlier than what was previous posted, those applying for early checkout would then be considered 'August graduates' (to find details on dates and deadlines, click here).

Mines has decided to increase the minimum stipend to $32,000 starting in Fall 2023; Barbari noted several programs were already at that level. Programs had pushed for a decision to present offers to students. Barbari noted this would be a challenge for research grants to pick up the difference; an early decision allows for time to strategize on how help can be provided to existing grant budgets.

- **Question** on when this stipend increase begins; Barbari reported the increased minimum stipend begins with Fall 2023 contracts.
- **Question** on when the stipend information will be distributed in writing; Barbari reported the information had been sent to department heads and IGP directors 2/28.

Registrar's Office Kendra Stansbury

No updates from the Registrar's Office.

Graduate Student Government Liam Witteman

Witteman reported GSG preparing for the Graduate Research and Discovery Symposium (GRADS) event April 5-6. The deadline for abstracts was 2/28, but abstracts would be accepted to the end of the week (click here for more information on GRADS).

Items for Council Vote from 2/15/23

1.1 **COMPUTER SCIENCE** Kelsie Diaz

[CIM 2/6]
1 program change: MSPHD-CS: MS & PhD – Computer Science
Changing pre-requisite requirements based on core course changes in undergraduate catalog

MOTION: To vote to approve the program change to MSPHD-CS: MS & PhD – Computer Science by Hildreth, seconded by Morrison. 16 for, 1 abstention.

1.2 **CHEMISTRY** Christine Morrison
[CIM 2/8]
1 program change: MPMSPHD-CH: MP, MS & PhD – Chemistry
Number of credits for MS degree was decreased from 24 to 18 credits, so that it now matches the number of credits required for the PhD degree.

MOTION: To vote to approve the program change to MPMSPHD-CH: MP, MS & PhD - Chemistry by Morrison, seconded by Hildreth. 16 for, 1 abstention.

1.3 **GEOPHYSICS** Jeffrey Shragge
[CIM 1/31]
1 program change: XCR-PEGP: Graduate Certificate in Energy Geophysics
We are requesting both a name and programmatic change for the existing Graduate Certificate in Geophysics. The name change is also consistent with market research (including by Mines personnel) that finds "energy" to be a more compelling term than "petroleum" with the demographic most likely to enter the Graduate Certificate program. Thus, it is likely to have broader appeal and likely increase enrollment. The programmatic change would allow us to broaden the types of courses offered in this program beyond petroleum (i.e., distributed fiber optic sensing; carbon capture, utilization, and storage), and provide a path for future extensions in the direction of geothermal, geophysical engineering (e.g., solar and wind resources), and locating the minerals required for the energy transition. It would also provide prospective students with greater flexibility in designing a graduate certificate program that is better aligned with their career goals and objectives. Finally, we note that all the listed courses already exist as online 8-week asynchronous courses; thus, there is minimal overhead for contributing faculty associated with this proposed name and programmatic change

MOTION: To vote to approve the program change to XCR-PEGP: Graduate Certificate in Energy Geophysics by Shragge, seconded by Morrison. Motion passed unanimously.

New Business

2.1 **ENGINEERING, DESIGN, AND SOCIETY** Juan Lucena
[CIM 2/14]
1 program change: MSCR-HES: Humanitarian Engineering and Science
Changes to the program are:
Replacing two core courses:
Adding EDNS 515, Intro to Science & Technology Studies (a currently existing, but renamed course) to replace EDNS 590 Risks in HES.
Adding EDNS 579 Community Based Research Methods (a new graduate level version of

this course) to replace the 400 level of this course.
Adding HASS 590, Energy & Society and EDNS 590 Risks in HES to the Elective List.

The changes proposed were made to backpack off information provided in the core courses of the program. EDNS577 packed with concepts from science and technology studies and the framework for related information in humanitarian engineering and science. EDNS515 would be an introductory course for the program, unpacking content in EDNS577 and allowing students to participate in discussion and inquiry into humanitarian engineering and science.

EDNS579 was added due to recent discussions on HLC Assumed Practices and the use of required 400-level courses in a graduate program. The 400-level remains in the undergraduate level for humanitarian engineering minors.

2.2 **ECONOMICS AND BUSINESS** Michael Heeley

[CIM 2/19; Provost 2/19]

1 new course: EBGN502: POLITICAL ECONOMY OF THE ENERGY TRANSITION

This course is a required class in the Carbon Capture Utilization and Storage (CCUS) graduate certificate program. The certificate program is part of Mines @150 plans to increase online professional graduate programs. Like the whole CCUS program, this course is offered online. The responsible faculty underwent Trefny Center Development in the Fall of 2021 with a course developer.

EBGN502 is an online course that had been offered twice.

- **Question** if there is a possibility to use the CCUS prefix for the course; Voelker recommended discussion offline for consideration of the CCUS prefix for the course. Barbari noted the CCUS prefix had been created due to the number of department participation in courses. Heeley reported the course would be solely taught by Ian Lange; Barbari recommended the course remain under the EBGN prefix.

2.3 **APPLIED MATHEMATICS & STATISTICS** Soutir Bandyopadhyay

[CIM 2/16; Provost 2/16]

2 new courses: MATH533: TIME SERIES AND ITS APPLICATIONS

The goals of this course are to develop an appreciation for the richness and versatility of modern time series analysis as a tool for analyzing data and still maintain a commitment to theoretical integrity. The advent of inexpensive powerful computing has provided both real data and new software that can take one considerably beyond the fitting of simple time domain models. This course is designed to be useful for students facing the analysis of time-correlated data in the physical, biological, and social sciences. It is intended for upper-level undergraduate students and beginning graduate students. This course will be taught interactively with some hands-on data manipulation using R. Industry expectations dictate a certain amount of expertise in data manipulation and analysis. The goal of this course is to better prepare the students for statistical computing in future course work and their careers once they graduate from Mines.

MATH552: KERNEL-BASED APPROXIMATION METHODS

Positive definite kernels play an important role in many different areas of mathematics, statistics, science, and engineering. These kernels are put into perspective, both historically, as well as scientifically via connections to related fields such as analysis,

approximation theory, the theory of integral equations, mathematical physics, probability theory and statistics, geostatistics, statistical or machine learning, and various kinds of engineering or physics applications. None of these fields is given a thorough theoretical treatment. Instead, these topics are presented via their relation to positive definite kernels. A sound approximation-theoretic foundation will be complemented by many computational illustrations in the context of applications from data fitting, the numerical solution of PDEs, and machine learning. New and recent developments in the field will also be featured. Coursework will consist of theoretical as well as coding assignments in the form of bi-weekly projects. This course, therefore, provides students with an important foundation for careers in fields relying on data-driven computational applied mathematics or statistics.

Both courses have been offered as special topics two times. MATH533 is taught by Bandyopadhyay. The course covers time series, its applications, and theory. Theory and applications of time series analysis are covered.

MATH552 had been described as computational mathematics and applied mathematics.

Faculty Mentorship Feedback Program Christine Morrison

Morrison provided background on the program and what had been done behind the scenes. In Fall 2022, Council recognized the value of a faculty mentorship feedback like teaching evaluations specifically for tenure/tenure-track faculty. Morrison shared her faculty mentorship feedback report with Council; the process was completed in partnership with the Trefny Center. Morrison had participated in the Trefny early course feedback program and worked with the developers A. Nave and C. Moulton.

Morrison, Nave, and Moulton met prior to the Winter Holiday and created a protocol for the pilot mentorship feedback program. There were stages of the program. A group of graduate students are provided a link to four survey questions, the faculty does not see the responses. The questions are vague to have students think on their own, the students were provided a week to answer the questions:

- How would you describe your PI's approach to mentoring? What are the strengths and weaknesses of their style? Please provide a few examples.
- What's something that you really value that your PI does? Why?
- What's something that you wish your PI would start doing? Why?
- What's something that you wish your PI would stop doing? Why?

Nave and Moulton met with Morrison's students, in person without Morrison present, to discuss the survey responses for forty-five minutes. Based upon the discussion, Trefny prepared a report. The report outlined major topics of discussion. Suggestions were provided, as well. Morrison noted she asked student feedback at the beginning of each semester, but did not receive constructive feedback. The feedback through Trefny provided additional professional development opportunities.

Morrison reported Trefny is unable to complete the task provided to Morrison at a larger scale; Trefny found the situation was outside of the Trefny umbrella as it was based around mentorship, rather than teaching.

Morrison had been introduced to Teaching Peer Review within the CH department; suggested the use of

paired faculty interviewing one another's groups. Morrison noted the feedback would not be anonymous, then, which may be an issue. Councilors agreed the feedback should be anonymous.

Councilor recommended the program fall under an Ombuds Office; process is underway for creation of an ombudsperson job description. Councilor noted there had been an email regarding workshops for faculty on effectively mentoring and workshops may be offered around campus; Councilor suggested distribution of such information during new faculty orientation. The workshops are done through the Center for Improvement of the Mentored Experiences in Research (CIMER, click here for more information).

Councilor recommended, for faculty with a smaller number of students, surveys are collected on a rolling basis so that feedback is provided over a longer period. Faculty mentoring one to two students may receive the feedback to increase the quantity of mentorship. Suggestion made to cut back on the in-person interview with the students.

Note made that the program may be more doable incoming faculty and tenure-track faculty; the tone for best practices would be set for mentoring.

Continuing Discussion from 2/15/23

Incorporating Internships into Degree Programs Tim Barbari

Barbari reported there was less excitement for creation of an internship program due to administrative burdens and processing of the new program through Council, Faculty Senate, the Board of Trustees, and other parties. Barbari recommended moving forward with option B: the credit-bearing internship course. The course exists as CSM597 on the books for summer, Council approval would add credits to the course. A faculty member should be associated with the course to approve that the course is following curricular content. The credit-bearing course would be associated with a form than an advisor and program director or department head would approve. If the course is for curricular practical training (CPT), the International Student and Scholar Services (ISSS) would sign off, as well. Through course substitution, the course may be counted toward electives of programs allowing it; there would be control at the program level.

- **Question** on the number of credits; Barbari reported the credit-bearing course would be three credits. Barbari noted the 165 hours of minimum work that coincides with a three-credit independent study, faculty engagement is low, the course may be similar. A monthly reported could be requested or a form of assessment palatable of the faculty and company supervisor.
- **Question** on what is needed of Council for the option presented; Barbari noted it is up to the Council to approve the movement of CSM597 into credit-bearing and offering the course as three-credits, as it zero credits in the Catalog.

Council recommended Catalog language be proposed for the credit-bearing course.

Mandatory Dismissal below 2.0 GPA Tim Barbari

The discussion was brought forward due to case studies in which students on academic probation twice in a row must provide a remedial plan. Students below a 2.0, while Barbari has the discretion to move to mandatory dismissal, noted students with an approved remedial plan from the department could be dismissed by Barbari. The language proposed fast tracks mandatory dismissal with an appeal mechanism.

- **Question** on how statistics had been gathered for the decision; Barbari reported academic probation is tracked by OGS and the data recovered from the last two to three years displayed lack of GPA recovery from below 2.0. CEE concern regarding how underrepresented students would be impacted by the change.
- **Question** on impact for students within certificate programs that drop out due to a single bad grade and consideration of grade replacements, similar at the undergraduate level; Barbari reported Mines had had a grade replacement policy for a ten-year period but it had been eliminated. Entertaining the grade replacement policy be reinstated would be a possibility.

Council requested postponing vote.

Councilor noted department did not see the reasoning to formally instate the process in Catalog language. Councilor noted additional data should be considered; students operating under significant stress do to the COVID-19 pandemic and health concerns.

3.3 **GEOLOGY & GEOLOGICAL ENGINEERING** Wendy Zhou
[CIM 2/7]
1 program change: CRMS-GISG: GIS & GeoInformatics – Certificates and MSNT
Because this is newly formed into the GIS master's degree as an ONLINE degree, there are a few changes to this program.

The GIS and GeoInformatics program went through a major transformation from face-to-face to a fully online program; the department developed several, new only courses and the proposed change reflects those courses and changes. The program is interdisciplinary; the courses are taken from three different departments. Effort had been made to assure students desiring an MS could complete the program within a year.

Adjourn Tina Voelker
Meeting adjourned: 5:01 pm.
Next meeting: March 15 4:00-5:00 pm via Zoom. Please send all agenda items to Mara Green (mgreen1@mines.edu) 1 week in advance.

Consent Agenda The following proposals will not be discussed unless specifically requested by Council. Please review the following items. With no objections, approval is implied and items will be processed accordingly.

4.1 **Approval of Minutes** – February 15, 2023 Tina Voelker

4.2 **CIVIL & ENVIRONMENTAL ENGINEERING** Kimberly Brock
[CIM 2/17]
46 course changes: CEEN501: LIFE CYCLE ASSESSMENT
Adding online modality.
CEEN505: NUMERICAL METHODS FOR ENGINEERS
CEEN506: FINITE ELEMENT METHODS FOR ENGINEERS
CEEN511: UNSATURATED SOIL MECHANICS
CEEN512: SOIL BEHAVIOR
CEEN513: ADVANCED GEOMATERIAL MECHANICS
CEEN515: HILLSLOPE HYDROLOGY AND STABILITY
CEEN519: RISK ASSESSMENT IN GEOTECHNICAL ENGINEERING
CEEN523: UNDERGROUND CONSTRUCTION ENGINEERING IN SOFT GROUND
CEEN525: CEMENTITIOUS MATERIALS FOR CONSTRUCTION
CEEN526: DURABILITY OF CONCRETE
CEEN530: ADVANCED STRUCTURAL ANALYSIS
CEEN531: STRUCTURAL DYNAMICS
CEEN533: MATRIX STRUCTURAL ANALYSIS
CEEN540: ADVANCED DESIGN OF STEEL STRUCTURES
CEEN541: DESIGNO OF REINFORCED CONCRETE STRUCTURES II
CEEN542: TIMBER AND MASONRY DESIGN
CEEN543: CONCRETE BRIDGE DESIGN BASED ON THE AASHTO LRFD SPECIFICATIONS
CEEN544: STRUCTURAL PRESERVATION OF EXISTING AND HISTORIC BUILDINGS
CEEN545: STEEL BRIDGE DESIGN
CEEN546: STATISTICAL METHODS FOR RELIABILITY AND ENGINEERING DESIGN
CEEN547: DESIGN OF PRESTRESSED CONCRETE STRUCTURES
CEEN550: PRINCIPLES OF ENVIRONMENTAL CHEMISTRY
CEEN551: ENVIRONMENTAL ORGANIC CHEMISTRY
CEEN555: LIMNOLOGY
CEEN556: MINING AND THE ENVIRONMENT
CEEN560: MOLECULAR MICROBIAL ECOLOGY AND THE ENVIRONMENT
CEEN562: ENVIRONMENTAL GEOMICROBIOLOGY
CEEN564: ENVIRONMENTAL TOXICOLOGY
CEEN566: MICROBIAL PROCESSES, ANALYSIS AND MODELING
CEEN570: WATER AND WASTEWATER TREATMENT
CEEN571: ADVANCED WATER TREATMENT ENGINEERING AND WATER REUSE
CEEN572: ENVIRONMENTAL ENGINEERING PILOT PLANT

LABORATORY
CEEN573: RECLAMATION OF DISTURBED LANDS
CEEN574: SOLID WASTE MINIMIZATION AND RECYLCYING
CEEN575: HAZARDOUS WASTE SITE REMEDIATION
CEEN580: CHEMICAL FATE AND TRANSPORT IN THE ENVIRONMENT
CEEN581: WATERSHED SYSTEMS MODELING
CEEN583: SURFACE WATER QUALITY MODELING
CEEN584: SUBSURFACE CONTAMINANT TRANSPORT
CEEN585: FLUID MECHANICS FOR HYDROLOGY
CEEN587: HYDROCHEMICAL AND TRANSPORT PROCESSES
CEEN589: WATER SUSTAINABILITY AND ENERGY PRODUCTION: CURRENT SCIENCE AND PRACTICE
CEEN590: CIVIL ENGINEERING SEMINAR
CEEN592: ENVIRONMENTAL LAW
CEEN707: GRADUATE THESIS / DISSERTATION RESEARCH CREDIT

Minor course description and changes to semesters/years offered.

4.2.1 **3 course deactivations**: CEEN582: MATHEMATICAL MODELING OF ENVIRONMENTAL SYSTEMS

Committee voted to deactivate because the course is no longer being taught.

CEEN610: INTERNATIONAL ENVIRONMENTAL LAW

600 courses not used.

CEEN611: MULTIPHASE CONTAMINANT TRANSPORT

Course is no longer being taught and needs to be removed from the Catalog.

4.3 **COMPUTER SCIENCE** Kelsie Diaz

[CIM 2/14]

6 course changes: CSCI536: HUMAN-ROBOT INTERACTION
CSCI542: SIMULATION
CSCI586: DATA MINING
CSCI571: ARTIFICIAL INTELLGIENCE
CSCI574: THEORY OF CRYPTOGRAPHY
CSCI585: INFORMATION SECURITY PRIVACY

Change to prerequisite: CSCI220 is replacing CSCI262.

4.4 **APPLIED MATHEMATICS & STATISTICS** Kelsie Diaz

[CIM 2/14]

1 course change: DSCI575: MACHINE LEARNING

Change to prerequisite: CSCI220 is replacing CSCI262.

4.4.1 [CIM 2/17] Soutir Bandyopadhyay

1 course change: MATH536: ADVANCED STATISTICAL MODELING

Update to course semester offering to Fall. MATH424 prerequisite changes to MATH324.

4.5 **GEOPHYSICS** Lynn Lundebrek

[CIM 2/17]

2 course deactivations: GPGN504: INTEGRATED EXPLORATION AND DEVELOPMENT

This course has been replaced by GPGN503.

GPGN509: PHYSICAL AND CHEMICAL PROPERTIES AND PROCESSES IN ROCK, SOILS, AND FLUIDS

This class was last offered in Fall 2014 and is no longer taught in the GP curriculum nor required for any degree programs.

4.5.1 [CIM 2/24]

6 course changes: GPGN519: ADVANCED FORMATION EVALUATION

Catalog description updated to reflect a more accurate scope of the course content.

GPGN552: INTRODUCTION TO SEISMOLOGY I

By Title both GPGN 552 and 553 look like duplicates; differentiating between them with a I and II. After a review of graduate prerequisites, it was determined that an undergraduate level prerequisite was not needed for success in this class.

GPGN533: INTRODUCTION TO SEISMOLOGY II

Differentiated between GPGN 552 with II as this is the second course in the sequence.

GPGN561: SEISMIC DATA PROCESSING I

Catalog description updated to be same as GPGN 461 as they are the same class.

GPGN574: ADVANCED HYDROGEOPHYSICS

Prerequisites were reviewed and determined that no undergrad classes were required to take the course; catalog description updated to reflect accuracy of course content.

GPGN577: HUMANITARIAN GEOSCIENCE

Re-evaluated prerequisites for graduate level classes and found that field camp is not a necessary prerequisite for this course.

4.6 **ENGINEERING, DESIGN, AND SOCIETY** Carolyn Freedman

[CIM 2/14]

1 program change: MSCR-HES: Humanitarian Engineering and Science

Changes to the program are:

Replacing two core courses:

Adding EDNS 515, Intro to Science & Technology Studies (a currently existing, but renamed course) to replace EDNS 590 Risks in HES.

Adding EDNS 579 Community Based Research Methods (a new graduate level version of this course) to replace the 400 level of this course.

Adding HASS 590, Energy & Society and EDNS 590 Risks in HES to the Elective List.