Colorado School of Mines – GRADUATE COUNCIL MEETING MINUTES
February 5, 2:00 – 3:00 pm, GC224/Zoom

Attendees:

Voting Members: 22 total (12 - majority needed for quorum). Quorum was present.

P	John Spear (Chair)	P	Danielle Ostendorf (LB)	P	Andy Osborne (NSE)	P	Uwe Greife (PH)
	Ian Lange (EB)	P	Bettina Voelker (CH)	P	Jaeheon Lee (MN)	P	Pejman Tahmasebi (PE)
P	Jeff Shragge (GP)	P	Ebru Bozdag (AMS)	P	Adrienne Marshall (HSE)	P	Jim Ranville (GC)
P	Mehmet Belviranli (CS)	P	Adrianne C. Kroepsch (HASS)	P	Ryan Venturelli (GE)		
P	Lori Tunstall (CEE)		Nikki Farnsworth (CBE)	P	Ellie Miller (GSG)		
P	Rajavasanth Rajasegar (ME)	P	Yamuna Phal (EE)		Kip Findley (MME)		

Other Regular Attendees and Guests

P	Carl Frick (OGS)		Carolyn Freedman (OGS)	P	Jenny Briggs (OGS)		Roxane Aungst (OGS)
	Wendy Adams (HNRS)	P	D. Scott Heath (RO)	P	Paul Myskiw (RO)		Colin Schneider (RO)
P	Sam Spiegel (Mines Online)		Suzanne Beach (Payne)	P	Kristeen Serracino (AA)		Richard Krahenbuhl (GP)
P	Jon Johnson (Mines Online)		Peter Concepcion (Grad Admissions)		Luke Contreras (Grad Admissions)		Kelsie Diaz (CS)
P	Cadi Gillette (IGP)		Rachel McDonald (IGP)				

Special Guest(s): Angel Abbud-Madrid, Frankie Zhu, Wendy Fisher, Zibo Wang, Dong Chen, Monica Kosanovich

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Welcome John Spear

Introduction of the new Advanced Energy Systems Director, Monica Kosanovich. Reminder of the upcoming 2025 Distinguished Lecture event featuring Christopher Higgins from CEE will be held on March 4th from 3:30-5:00 pm in the Student Center Grand Ballrooms.

Briefings and Information Items

Office of Graduate Studies Carl Frick/Jenny Briggs

There was some direction from the Provost and VPRTT to suspend PhD hiring due to the ambiguity surrounding the federal funding and the announcement that NIH has capped the indirect cost rate at 15% for all research grants for about a month. The institution's overall response has been to refrain from panicking in this situation until more clarification is provided. C. Frick reached out to leadership about faculty hiring and the response was that Mines will proceed with caution but will move forward with all scheduled interviews for current open positions.

- **Question:** J. Spear asked, the institution is not panicking but are people within the institution panicking or worried?
- **Answer:** C. Frick answered there was a cabinet meeting earlier today to discuss this issue. The underlying theme was we do not know what will happen and this situation is similar to the early days of COVID. Based on predictions, federal funding will most likely go down, but it is unknown of the magnitude which has caused concern.

Registrar's Office Paul Myskiw

Summer and Fall registration are around the corner. The new product for advising, SmartPlan, is currently being worked on. The plan is to be done by November and start with undergraduate programs first before using it for graduate programs. An interesting feature of SmartPlan is a self-healing audit which allows students to move courses around in real time and show the impact of time to graduation and cost. This will be impactful for undergraduate students.

- **Queston:** J. Briggs asked, is the output that the product gives in test cases similar to a live advisor or is it more sophisticated?
- **Answer:** P. Myskiw answered that nothing replaces a live advisor, but it does allows students to see multiple options of courses and/or sequences of courses and allows the Registrar's Office to place credit hours limits.

Graduate Student Government Ellie Miller

After the previous GC meeting, GSG reached out to various members of the graduate student community to understand how people are navigating the new landscape and collect feedback on how students would like to be supported during this time. These discussions have been ongoing and there will potentially be a survey sent out in the next few weeks. After speaking with some undergraduate students that interact with GSG, it seems like the communications that USG is receiving compared to GSG is very different. GSG (and OGS) are not receiving very much information from the university level about the recent executive orders which has caused some confusion and miscommunication. For some students, it may be inducing some panic especially regarding the funding situation. Students are seeking more transparency, even if there is not any new information, to know what the situation is and how students can be adapting/preparing as the landscape continues to change and unknowns continue to be factored in. There is an upcoming meeting between both student governments in March with several campus leaders to comment and field some complaints, especially from the graduate student side. . More details to come. C. Frick will be joining the GSG meeting later today to provide a recent update to graduate students similar to what was shared during Grad Council.

- **Question:** R. Venturelli asked, are graduate students seeking more communication from someone higher up than their advisor?
- **Answer:** E. Miller answered yes. This seems to be what USG is receiving but GSG is not.
- **Comment:** J. Briggs added that the international offices have reached out to all international and undocumented graduate and undergraduate students and provided red cards which directs any immigration official that shows up to question a student to the General Counsel office in Guggenheim and affirms that the student is not obliged to answer any question while they are a Mines student.
- **Comment:** J. Spear added that one of the most powerful resources we have on campus is our ears. If the campus can practice good listening, it can help everyone get through troubling times.

2:30-2:40 pm **Continued Business**

MOTION: The motion to suspend the voting rules and vote on continued business was moved by R. Venturelli and seconded by Y. Phal. The motion to suspend the voting rules and vote on continued business was approved unanimously with zero opposition and zero abstentions.

- **Comment:** J. Shragge suggested forming a subcommittee to review the rules and see if they can be adjusted to prevent having to suspend voting rules in future meetings.

1.1 **CS** Mehmet Belviranli

[CIM 1/28; 1/29; Provost 1/29]

4 new courses: **CSCI520: SOFTWARE ENGINEERING SYSTEMS DEVELOPMENT I**

This is one of a two-semester sequence of courses that will be the unique cornerstone for the Advanced Software Technologies Track of the CS OL Professional Master's Program and not intended for on-ground

deployment. The track in Advanced Software Technologies is targeted to train recent graduates or mid-career professionals with a bachelor's degree in computer science or other STEM-related field with acquired basic knowledge in programming, data structures, and software engineering.

CSCI 520:
All the course content will be organized into Modules. Inside the modules you will find assignments, discussions, and quizzes to go along with lecture slides.
Module 1: Introduction to Systems Development
Module 2: Introduction to Project Management
Module 3: Systems Definition
Module 4: Systems Specifications
Module 5: Component Analysis and Selection
Module 6: System Modeling
Module 7: Proof-of-Concept Development

CSCI 521
Module 8: System Integration
Module 9: System Testing
Module 10: System Evaluation
Module 11: System Deployment
Module 12: System Extensibility

Note: We have received approval from Iris, Dean Berger, and Carl Frick. We have submitted a request to Jon in the Online Center for approval of the 2025 Development. Thus, we need a permanent number to be able to create an online course.

CSCI521: SOFTWARE ENGINEERING SYSTEMS DEVELOPMENT II

This is the second of a two-semester sequence of courses that will be the unique cornerstone for the Advanced Software Technologies Track of the CS OL Professional Master's Program and not intended for on-ground deployment. The track in Advanced Software Technologies is targeted to train recent graduates or mid-career professionals with a bachelor's degree in computer science or other STEM-related field with acquired basic knowledge in programming, data structures, and software engineering.

- **Question:** J. Spear asked, have delivery of courses over the next few years been planned and who will teach them?
- **Answer:** W. Fisher answered the CS is working in conjunction Donna Bodeau in ETM to develop these courses in Software Engineering. She is able to teach these courses as well as several CS faculty members.

MOTION: The motion to approve CSCI520 and CSCI521 was moved by J. Shragge and seconded by R. Venturelli. The motion to approve CSCI520 and CSCI521 was approved unanimously with zero opposition and zero abstentions.

CSCI576: DEEP LEARNING

This hands-on course deep learning course combines foundational theory with extensive practical coding and project-based learning. Students will explore neural networks, regularization techniques, and state-

of-the-art architectures for computer vision (CNNs, GANs, transfer learning) and natural language processing (transformers, BERT, GPT). Reinforcement learning is introduced through deep Q-learning and decision-making frameworks. Real-world case studies and ethical considerations, including bias and fairness, are integral to the curriculum. By the end of the course, students will have a portfolio of projects showcasing their ability to design, implement, and evaluate advanced deep learning models, preparing them for impactful roles in academia or industry.

Modules:
1. Introduction to deep learning
2. Deep learning in computer vision
3. Deep learning in natural language processing
4. Reinforcement learning
5. Deep learning ethics

This course is a split from the current CSCI 470/570 Introduction to Machine Learning. Future 470/570 will focus on traditional machine learning, while this course will focus on deep learning. This is a hands-on, project-based learning course with heavy emphasis on Python Jupyter Notebook programming with libraries like TensorFlow.

This course is offered both in-person and online
FOCD completed in July 2022
Complete the development in Aug 25
First delivery in Spring 2026
Open for registration in Fall 25

- **Question:** J. Spear asked, how is Deep Learning going to be different from the current Machine Learning course and the Advanced Machine Learning course?
- **Answer:** Z. Wang answered the current Machine Learning course is half traditional machine learning and half deep learning. The plan is to split the current Machine Learning course into a new Intro to Machine Learning course which focuses on traditional machine learning. This new Deep Learning course will be the other half that focuses on deep learning. Additionally, this course will be very hands-on with application-based and project-based learning which differs from Advanced Machine Learning which is theoretical only.
- Question: J. Spear asked, will there be a large enrollment for this course?
- Answer: Z. Wang answered the current Machine Learning course has a large enrollment. It runs every semester for the online course and in the Fall for the in-person course with 2-3 sections. Every offering, enrollment is full and has a long waitlist and CS anticipated similar enrollment numbers for this course.

MOTION: The motion to approve CSCI576 was moved by J. Spear and seconded by R. Venturelli. The motion to approve CSCI576 was approved unanimously with zero opposition and zero abstentions.

CSCI583: IOT SECURITY AND PRIVACY

The use of IoT (Internet-of-Things) devices in U.S. homes is becoming increasingly popular. These smart devices, however, come with a range of new security and privacy risks that must be addressed, particularly in light of emerging AI techniques. AI-powered attacks and their prevention are significant

gaps in this area. This course focuses on teaching both foundational and advanced concepts of IoT security and privacy from a data-driven perspective. This course stands apart from other offerings by covering topics such as networking and Internet security while integrating security research through data analysis. Students will read and present academic papers spanning multiple disciplines and perspectives, including computer science, psychology, policy, and law. The course also features hands-on projects where students independently investigate real-world security and privacy challenges of IoT devices and systems, proposing practical solutions to address them. While CSCI585 and CSCI587 introduce general principles of information security and privacy, this proposed course delves into the core of security and privacy within the largest domain—IoT. It uniquely combines insights into vulnerabilities with prevention strategies using the latest AI techniques, equipping students with cutting-edge knowledge to tackle modern challenges.

The future of engineering and technology will be driven by AI@Edge, TinyML, and advancements in security and privacy. Safeguarding the security of IoT devices and systems is, and will remain, one of the key challenges that the industry must address. Introducing a course in our curriculum that focuses on teaching state-of-the-art practices to prepare students for this challenge aligns with Mines' broader strategic goal of being "a top-of-mind and first-choice university" by "expanding offerings and diversifying delivery." This course will equip students with the skills needed to tackle critical industry demands while reinforcing Mines' leadership in innovative education.

- **Question:** C. Frick asked, is this course offered online? Has it been approved by the DH and Dean? What has been the enrollment for this course? What are the prerequisites for this course? Are students outside of CS qualified to take this course?
- **Answer:** D. Chen answered this course is offered in-person and is seeking a permanent course number (offered twice as a special topics course). It has been approved by the DH but not the Dean (Dean approval for online only). Enrollment has been around 30-50 students). There are no prerequisites for this course. This course is for currently CS program students only but can be taken by students familiar with programming and cybersecurity.
- **Comment:** C. Frick added that one thing to keep in mind is there is an interest especially from combined and non-thesis master's students so prerequisites may be needed to ensure appropriate students enroll into the course. P. Myskiw added that generally, graduate courses at Mines do not enforce prerequisites. Instead, graduate programs can place program restrictions on courses for cases like combined students.

MOTION: The motion to approve CSCI583 was moved by J. Spear and seconded by J. Shragge. The motion to approve CSCI583 was approved unanimously with zero opposition and zero abstentions.

1 course change: CSCI578: BIOINFORMATICS

This course will be offered to graduate students in CS (both graduate and combined programs) and cross-listed with BIOL510 it will be offered to Quantitative Biosciences and Engineering students. With both in-person and online modality versions, it will be accessible to a large number of students who are interested in practical applications of algorithms and machine learning to life sciences. Updated course description and added CSCI128 and CSCI220 as prerequisites. Added summer semester to be offered.

There was concern brought up in the previous GC meeting about the prerequisites. As a result, the CS department decided to remove the second prerequisite, CSCI220, as the faculty member teaching this course is introducing specific data structures within the course content. There was still concern from the

Council about having a 100-level course as a requirement for a graduate-level course.

- **Question:** R. Venturelli asked, what if a student taking this course is from a different university?
- **Answer:** M. Belviranli answered as long as the student has some programming background, they will be successful in the course.
- **Comment:** R. Venturelli suggested that the prerequisites can state students must possess a programming background.

This course will be revised and voted on during the next GC meeting.

- **Additional Discussion:** There seems to be inconsistency regarding prerequisites for graduate courses. There are several examples in the catalog of graduate courses with undergraduate prerequisites. If a student is from a different institution, is a course exception process that allows them to still take a course enough? It used to be that 500-level courses could not have prerequisites, but 600-level courses could have a 500-level prerequisite. This may be a broader conversation as the graduate catalog is very inconsistent (some courses have undergraduate prerequisites, some have none, some have "graduate level standing"). Could the Council assist with best practices to update the graduate catalog accordingly? C. Frick volunteered to take this on as an action item to come up with some best practices and come up with a reasonable plan. R. Venturelli added that the Geological Engineering program just changed program language to include core competencies which list bachelor's level coursework that is expected before students apply to the program and make it clear that if students do not have this coursework, they may be asked to take an undergraduate level course.

1.2 **GE** Ryan Venturelli
[CIM 1/30]
1 course change: **GEOL515: ADVANCED MINERAL DEPOSITS**

This request reduces the number of credits for this course and slightly updates the course description. The course has not been taught for years but will be revived at lower credits in Fall 2025.

This course is expected to have about 20 students per year enrolled in this course because of the change in credit hours.

MOTION: The motion to approve the GEOL515 course change was moved by J. Spear and seconded by J. Shragge. The motion to approve the GEOL515 course change was approved unanimously with zero opposition and zero abstentions.

1.3 **ME** Angel Abbud Madrid
[CIM 1/30; Provost 2/3]
1 new course: **SPRS509: SPACE ROBOTICS**

The Space Resources online graduate program is the first one in the world educating scientists, engineers, economists, entrepreneurs, and policy makers in the field of space resources. This one-of-a-kind, innovative, multidisciplinary program aims to take the 150-year-old, world-renowned expertise at Mines in resource exploration, extraction, production, and utilization to its next frontier by identifying, extracting, and using resources beyond Earth. This online course equips students with the foundational knowledge and skills to design, analyze, and operate robotic spaceflight missions, focusing on the intersection of space exploration and robotics. By exploring scientific questions about planetary bodies and the technologies enabling robotic missions, students will define and develop a new mission,

identifying critical data signals, sensors, operations, and actuators. They will evaluate automation trade-offs, understand rover mobility, and synthesize robotic capabilities into measurable outcomes. This course prepares students for frontier careers in aerospace and robotics, equipping them with the technical, analytical, and organizational skills needed to tackle complex challenges in the field.
Provide detail about how the course will be delivered: Online.
If online is listed:
- Cite the date the responsible faculty has completed or will complete the Foundations of Online Course Design (FOCD): The instructor completed the FOCD on 09/24/2024
- Anticipated date for course development completion: June 30, 2025
- Anticipated first semester of delivery: Fall 2025

- **Question:** J. Spear asked, when will this course be offered?
- **Answer:** F. Zhu answered if will be offered in the second summer session (June to August).
- **Question:** R. Venturelli, how many students are expected?
- **Answer:** F. Zhu answered there is a cap of 30 and is anticipated to be a full course.

MOTION: The motion to approve SPRS509 was moved by J. Spear and seconded by R. Venturelli. The motion to approve SPRS509 was approved unanimously with zero opposition and zero abstentions.

2:40-2:50 pm **New Business**

2.1 **EDNS**
[CIM 2/6]
4 course deactivations: **INNO544: INNOV8X CREATE DSCI**
INNO545: INNOV8X STUDIO
INNO598A: SPECIAL TOPICS
INNO598B: SPECIAL TOPICS

At the provost's request, we are removing the INNO prefix and reinstating the ENDS prefix for Innov8x.

Need for information regarding these deactivations. Invite an EDNS representative to present these at the next meeting.

2.2 **ME** Rajavasanth Rajasegar
CIM 2/11
2 course changes: **MEGN510: THEORY OF ELASTICITY**

Minor update to course description; added online modality.

MEGN579: OPTIMIZATION MODELS IN MANUFACTURING

Minor update to course description; added online modality.

These changes include updating the course descriptions and course learning outcomes to the current offerings and adding online modality.

- **Question:** C. Frick asked, what is the enrollment of these courses when they were taught in-person? Are these courses cross-listed with the Operations Research course?
- **Answer:** R. Rajasegar answered this information will be collected and presented at the next

meeting. MEGN579 is cross-listed with the undergraduate version course, MEGN479. MEGN510 has an equivalent course in MTGN.

2.3 **CH** Tina Voelker
CIM 2/13
1 course change: **CHGN560: GRADUATE SEMINAR**
Updating to reflect change from MS and PhD level seminar courses to a single seminar course.

1 course deactivation: **CHGN660: GRADUATE SEMINAR, PHD**
The department is going to a single number for the graduate seminar, CHGN560, instead of having separate numbers for MS and PhD level seminars.

1 program change: **MSPHD-ACH: MS & PHD IN CHEMISTRY AND APPLIED CHEMISTRY**
These are housekeeping changes that do not affect other programs.
1. Clarified that independent study for MS-nonTh is always done as CHGN699, and that CHGN699 could be done as an off-campus internship.
2. Removed references to the PhD level seminar course, CHGN660, since we will just have a single seminar course, CHGN 560, going forward.
3. Added information on format of thesis proposal.
4. Revised timing of comprehensive exam, seminar presentation, and thesis proposal according to new department policy.

These are internal changes that do not affect other programs. The changes include moving from two seminar courses (master's and PhD) to one single seminar course and clarify the non-thesis master's program which requires an independent study course and the timing of the comprehensive exam and seminar presentation/requirements.

MOTION: The motion to approve the Chemistry course and program changes was moved by J. Spear and seconded by R. Venturelli. The motion to approve the Chemistry course and program changes was approved unanimously with zero opposition and zero abstentions.

2.4 **NUCLEAR ENGINEERING** Andy Osborne
CIM 2/13
1 program change: **MEMSPHD-NUAS/NUEG: ME, MS & PHD IN NUCLEAR ENGINEERING**
Adding CHGN513 to the list of core electives will expand student choice and provide better alignment for radiochemistry grad students.

Question: J. Spear asked, who will teach CHGN513?
Answer: A. Osborne answered, Tom Albrecht will teach this course.

MOTION: The motion to approve the Nuclear Engineering program change was moved by R. Venturelli and seconded by J. Spear. The motion to approve the Nuclear Engineering program change was approved unanimously with zero opposition and zero abstentions.

3:00 pm **Adjourn** John Spear

Next meeting:
March 5, 2:00-3:00 pm GC224/Zoom. Please send all agenda items to John Spear (jspear@mines.edu) or Kristeen Serracino (kristeen.serracino@mines.edu) 1 week in advance.

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

3.1 **Approval of Previous Minutes** – *February 5, 2025* John Spear

3.2 **ME** Rajavasanth Rajasegar
CIM 2/11
4 course changes: **MEGN511: FATIGUE AND FRACTURE**
Updates to course description.

MEGN552: FLUID, THERMAL, AND MASS TRANSPORT
Promote distinction with MEGN551, Advanced Fluid Mechanics, by updating course title.

MEGN571: ADVANCED HEAT TRANSFER
Updates to course description.

MEGN651: ADVANCED COMPUTATIONAL FLUID DYNAMICS
Minor updates to course description; Added MEGN502 and MEGN551 are recommended as prerequisites.

3.3 **PE** Pejman Tahmasebi
CIM 2/12
1 course change: **PEGN511: ADVANCED THERMODYNAMICS AND PETROLEUM FLUIDS PHASE BEHAVIOR**
Removed PEGN310 as a prereq; added PEGN312 as a prereq.

3.4 **CH** Tina Voelker
CIM 2/13
2 course changes: **CHGN699A: INDEPENDENT STUDY**
CHGN699B: INDEPENDENT STUDY
Added clarification that course number can be used for an internship.