

Colorado School of Mines – GRADUATE COUNCIL MEETING AGENDA  
February 21, 2024, 4:00 – 5:00 pm, via Zoom

**Attendees:**

**Voting Members:** 24 total (16 - majority needed for quorum). Quorum was present.

P	Soutir Bandyopadhyay (Chair)	P	Danielle Ostendorf (LB)	P	Andy Osborne (NSE)	P	Owen Hildreth (ME)
P	Adrienne Marshall (HSE)	P	Bettina Voelker (CH)		Jaeheon Lee (MN)		Jared Carbone (EB)
P	Yaoguo Li (GP)	P	Juan Lucena (EDS)	P	Jim Ranville (GC)	P	Pejman Tahmasebi (PE)
P	Suveen Mathaudhu (MME)		Nikki Farnsworth (CBE)	P	Ryan Venturelli (GE)		Dong Chen (CS)
P	Adrienne C. Kroepsch (HASS)	P	Yamuna Phal (EE)	P	Rena Zhu (GSG)	P	Samy Wu Fung (AMS)
		P	Lori Tunstall (CEE)	P	Gabriel Walton (UCTE)	P	Uwe Greife (PH)

**Other Regular Attendees and Guests**

P	Tim Barbari (OGS)		Carolyn Freedman (OGS)	P	Jenny Briggs (OGS)		Vibhuti Dave (UG)
	Wendy Adams (HNRS)	P	D. Scott Heath (RO)	P	Paul Myskiw (RO)		Roxane Aungst (OGS)
P	Sam Spiegel (Mines Online)		Suzanne Beach (Payne)		Jen Gagne (Grad Admissions)		Valerie Holt (AES)
	Jon Johnson (Mines Online)		Atef Elsherbeni (EE)		Richard Krahenbuhl (GP)	P	Kristeen Serracino (AA)
P	Colin Schneider (RO)	P	Cadi Gillette (IGP)				

**Special Guest(s):** Peter Aaen, Sabina Schill,

**Welcome**

Soutir Bandyopadhyay

**Briefings and Information Items**

*Office of Graduate Studies*

Tim Barbari

This is reminder about the April 15<sup>th</sup> deadline, which is signing day for financial aid offers, mostly for PhD and master’s thesis students. We are a signee of the Council of Graduate School’s agreement that no one will pressure students to decide on any offers before that day. However, you can remind applicants of the April 15<sup>th</sup> deadline or say that if they decide earlier than the deadline to let us know so that we can make an offer to another deserving candidate and that tends to resonate with students. This helps those faculty that tend to make offers directly into their groups or lab and would like to have a decision earlier.

*Registrar’s Office*

Paul Myskiw

The timeline for the catalog production was extended to give us a little more time. It has extended to the end of March. This will include the cross-listing of courses which we will be doing administratively on the back end to skip the workflow steps and councils.

*Graduate Student Government*

Rena Zhu

We are getting for GRADS. We are also shifting gears into data analysis, specifically the quality-of-life data that we get from graduate student responses. We are hoping to get some important insights and concise short summaries to share with different teams in different ways.

**4:20-4:30 pm Graduate Faculty Definition in Handbook**

Tim Barbari

Attached is a schematic of current versus proposed categorizations of graduate faculty. The top box represents the graduate faculty who can be any member of the committee, but most importantly,

advisor. The box below are all the titles that we allow to be serving as either chair member or co-advisor on a committee. We are proposing to redefine the graduate faculty as everybody who could serve on committees, but only full members can serve as an advisor. The intent is to get rid of the laundry list of titles and collapse it down to just associate members of the graduate faculty. These can be designated in Banner. We found a few faculty screens where some attributes already exist which will make running reports much easier. It will also open more possibilities for the OnBase thesis committee electronic form to check to see if people are members of the graduate faculty before the form can be continued in the workflow. Right now, the process is to manually check to see if a person has one of these titles. The other reason we are proposing this change is that we have a lot of people who do not have these titles but have the credentials to serve on committees, but they are not allowed to. Instead of adding to the laundry list of titles, we thought we could give these people the same kind of attribute as associate members of the graduate faculty. These are mostly research associates that are in the Payne Institute or in our shared instrumentation facility. Some of them have research associate titles but some of them are administrative faculty with other titles. Everyone that is currently graduate faculty will get manually moved over to full member graduate faculty and everyone else will be moved to associate member. This will be a lengthy move, but we plan to do this during the summer. Then, when new faculty are hired, they will immediately get categorized as a full member or associate member depending on if they are qualified as part of the onboarding process, ensuring that they have the correct title. The current process we use to elevate someone to graduate faculty via departmental approval will stay the same to elevate someone from associate member to full member so there will be no extra work for departments other than some of the research associates that we want to get approved as associate members.

**Question:** If there are members completely external to Mines that we want to put on the committee, will that process remain the same?

**Answer:** Yes. What I presented only includes people within Mines but if they are off campus external members that will not change. Those people cannot be advisors, but they can be co-advisors or members. If they are approved to be on a committee, we have a mechanism in place to give them a CWID to put them into Banner, but we will not give them graduate faculty status.

**Question:** Should we list anywhere on here the number of teaching faculty, research faculty, or non-tenure tenure track faculty that can make up a committee?

**Answer:** That already exists in the catalog and on the form, so I did not include it here. For reference, a PhD committee must have four required members – advisor, committee chair, and two additional members. We removed the restrictions we used to have such as all must be within the same department or program.

**Question:** Is there any worry about the differences in department approval processes at a higher level? For example, if Geology accepts something but Geophysics does not, is that a problem that we need to worry about?

**Answer:** The assumption is that if a department approves someone to be a full member to be able to serve as an advisor, that person could be approved for any committee.

**Question:** What does the ineligible term refer to?

**Answer:** It is a superscript that refers to the bottom box which includes research associates, qualified admin faculty, and joint appointees that would require departmental approval to elevate them to an associate member of the graduate faculty, but they are ineligible to become full members. That is a little bit different for joint appointees now because we have had some situations where joint appointees are advisors, but they cannot be supervisors in Workday. We want the advisor and supervisor to be the

same person. HR has also told us that it is probably not good to have someone who is not a Mines employee to be the advisor of record because they cannot be a supervisor. This will also allow more structure for our research titles. Right now, you can only be a postdoc for two years. If you stay on, you can become a research associate, so this opens the doors for those people to be a associate members and members of committees through departmental approval.

**Question:** For IGPs, who would approve membership?

**Answer:** Currently, people that have faculty appointments always have a home department. If someone has a research faculty appointment, in ME for example, ME would elevate that person up but then they could still serve on IGPs. For the research associates that are not departmentally appointed would have to find a department that is closest to their field that would be willing to approve them to associate status.

**MOTION:** The motion to approve the Graduate Faculty definition in the Handbook by Yaoguo, seconded by Adrienne. The motion to approve the Graduate Faculty definition in the Handbook was passed with 16 approved, 0 opposed, and 0 abstentions.

4:30-4:40 pm **Continued Business**

1.1 **CCUS** Erik Menke

[CIM 1/12; Provost 1/12]

**1 new course:**

CCUS522: NON-GEOLOGIC CARBON  
CAPTURE AND UTILIZATION

*This is an existing course that is an elective for the CCUS certificate program. The reason for this request is that it has been taught as a special topics course (SYGN598C) and now needs its own course number and listing.*

**Comment:** Just a reminder that this is a required course for CCUS that is just getting a permanent course number. The program itself has already been approved by grad council.

1.2 **ELECTRICAL ENGINEERING** Peter Aaen

**4 new programs:**

[CIM 2/13; PROVOST 2/13]

: PROFESSIONAL ONLINE MASTERS IN  
ELECTRICAL ENGINEERING

*In the Fall of 2023, President Johnson and Provost Holz, requested that the Electrical Engineering department accelerate the development of an online professional master's degree. This degree and the certificates that comprise it along with similar degrees from Mechanical Engineering and Computer Science are core Mines' goal to increase the number of non-thesis Master's students. The objective is to have between 1500-2000 students taking online master's degrees and profits from our online programs will be re-invested into graduate programs across Mines.*

*The areas covered by our online program are of great interest to electrical engineers working in local industry and at the national level. This professional master's degree is being offered entirely online and is designed so that students can earn three certificates as they progress through their coursework.*

## : INFORMATION AND SYSTEM SCIENCES

*Data science refers generally to the principles and procedures for modeling, processing, analyzing, and reacting to data from diverse sources. Although the term “data science” is somewhat loosely defined, most tasks in data science draw from one or more of the following disciplines: statistics; machine learning and data mining; signal processing; optimization; computer programming; databases; and domain expertise relevant to the system generating the data (such as a smart grid or a social network).*

*In response to the challenges of the Big Data era, data science has recently become a major focus area in industry and academia. A number of universities are offering professional Master’s degrees under the names of Data Science, Big Data Analytics, and similar names; many other engineers work with data but may not formally have the job title of data scientist.*

*These areas are of great interest to working professionals electrical engineers in local industry and at the national level. Such offerings will increase the enrollment of non-traditional students and will increase the number of non-thesis MS students.*

*This certificate is being offered as an online certificate.*

## : MICROWAVE ENGINEERING

*The field of radio frequency (RF) and microwave engineering is extremely rich in technical content and high in demand in industry, national laboratories, and the military. Unfortunately, despite that the market is actively looking for qualified candidates, not many electrical engineers graduate with a good knowledge and understanding in this area.*

*RF and microwave engineering is a mature field that draws upon multiple disciplines, and as such, generally courses in this area are offered as senior level electives in an undergraduate electrical engineering (EE) curriculum, and typically without laboratory sessions. Continued growth in the mobile telecommunications market (5G), space-based internet, internet-of-things (IoT), quantum engineering, and increased growth in the semiconductor market (due to the CHIPS act) all require more qualified engineers. This combined with the fact that engineering design is now heavily dependent on computer-aided design (CAD) significantly limits the practical ability of the students in this area.*

*In response to these workforce challenges, microwave engineering has become a major focus for industry and to bridge this gap between workforce needs and EE education we propose a new online certificate in Microwave Engineering.*

*This certificate will focus on theoretical aspects of microwave devices, networks, and systems, design and optimization of modern microwave devices, CAD, fabrication technologies, and device and system measurement techniques. This certificate offering is designed to leverage our existing strengths in the Electrical Engineering department and to serve the industries, particularly those in the Denver metropolitan area that deal with RF and microwave devices and systems.*

*This certificate is being offered as an online-certificate.*

**: POWER AND ENERGY SYSTEMS**

*The Future Electric Grid will be smart, with user-interaction, bidirectional power flow because a deep penetration of renewable energy resources will allow electrical power flow among users and the grid. Therefore, system-level dynamics and control need an advanced and high-tech understanding. Students in this Certificate Program will learn about the combined power system and power electronics approach, where enabled renewable energy systems, will interact with the utility grid, establishing microgrids, and intelligence and data communication will make the future grid a Smart-Grid.*

*These areas are of great interest to working professionals in local industry and at the national level. Such offerings will increase the enrollment of non-traditional students and will increase the number of non-thesis MS students.*

*This certificate is being offered as an online certificate.*

**1 new course:**

[CIM 2/12; PROVOST 2/12]

EENG598: ADVANCED DIGITAL SIGNAL PROCESSING

*New Advanced DSP class for new online graduate certificate in Information and System Sciences.*

**1 new course:**

EENG510: ADVANCED DIGITAL SIGNAL PROCESSING

*New Advanced DSP class for new online graduate certificate in Information and System Sciences.*

**Comment:** As a request, could you reach out to some of the faculty that I have included in an email. We want to make sure we have sufficient resources to support your students. One concern we had was if you open up 502 for the online, it will also need to be available to residential students. We are unsure if we have the resources to do both.

**Comment:** We are not planning on opening that course up for the residential students at all so this would only be for the online students.

**Comment:** This proposal differs from the Data Science proposal in that Electrical Engineering is proposing a professional master's degree and not a Master of Science degree. The concerns regarding the residential and online modality for a non-thesis masters were that both modalities looked equivalent. However, with this proposal, they are proposing a stand-alone online professional master's so it will not need to be the same as the residential program.

**Comment:** That is something we kept in mind as we were working with local employers as they are requesting something different than what we are doing in the residential program. This is why we are including the three stackable certificates.

**1.3 COMPUTER SCIENCE**

**1 program change:**

[CIM 1/18]

Dong Chen

MSPHD-CS: MS & PHD IN COMPUTER

SCIENCE

*CSCI406 and CSCI442 are being taken out of the core course requirements for the MS and PhD so we are abiding by the HLC guidelines. Changing combined program minimum GPA to 3.0*

**1.4 AMS** Samy Wu Fung  
**1 course change:**  
[CIM 1/30] MATH540: PARALLEL SCIENTIFIC COMPUTING

*Two small changes: (1) switching from spring to fall course, and (2) adding MATH307 and CSCI200 prerequisites.*

**1.5 GEOPHYSICS** Yaoguo Li  
**1 new course:**  
[CIM 2/6; PROVOST 2/7] GPGN573: POLAR CRYOSPHERE

IN THE

EARTH SYSTEM

*This graduate level class serves as a training corner stone for graduate students in an emerging research strength at Mines in climate and cryospheric science. The polar cryosphere on Earth and elsewhere in the Solar System is a frontier research target, critically important to understand planetary climate systems and future space exploration. Having a dedicated course in polar cryospheric science positions Mines to be top-of-mind for STEM-focused graduate students interested in planetary extremes.*

**MOTION:** The motion to suspend the rule to discuss before a vote was moved by Yaoguo and seconded by Tina. The motion was unanimously approved with zero opposed and zero abstentions.

**MOTION:** The motion to approve GPGN573 was moved by Yaoguo and seconded by Soutir. The motion to approve GPGN573 was approved with 16 approved, 0 opposed, and 1 abstention.

**1.6 ROBOTICS** Andrew Petruska  
**3 new courses:** Cadi Gillette  
[CIM 2/2] ROBO598: SPECIAL TOPICS  
ROBO599: INDEPENDENT STUDY  
ROBO 707: GRADUATE  
THESIS/DISSERTATION RESEARCH  
CREDIT

4:40-4:50 pm **Curriculum Item(s) for Council Vote**

**2.1 CSED** Sabina Schill  
[CIM 12/12; Provost 12/12]  
**4 new courses:**  
CSED530: COMPUTER SCIENCE PRACTICES AND TECHNOLOGICAL IMPACTS ON SOCIETY

*Providing Computer Science Teacher Education aligns with Mines@150 goals to produce differentiated and highly desired STEM education leaders and to become a leader in educating STEM students and professionals. Computer Science (CS) professionals are the most needed STEM professional in the workplace. Engineers, scientists, and mathematicians who know CS will be able to provide more effective expertise. Currently, Mines leads in Colorado innovatively providing needed pre-service teacher training for CS teacher educators. CS teachers with Mines degrees will be more likely to encourage students to attend Mines, creating a pipeline of students for the second most popular degree at Mines, CS. The proposed course will assist future CS teachers and engineers applying CS to understand the ethical implications of optimal and poor code. Students will also develop strategies to include ethical discussions in the software or engineering design cycle, as well as teach K-12 students CS professional practices and ethics. This is a residential course, meeting in-person 3 times each week.*

#### CS535: COMPUTER SCIENCE TEACHING TECHNIQUES

*As a new pre-service Teach@Mines course for master's students, CS Teaching Techniques aligns with Mines@150 plans regarding being an innovative STEM education leader, top of mind university, developing graduates who will have a profound and innovative impact on society. Currently, Mines offers the only CS undergraduate pre-service teacher licensure program in Colorado and one of the only programs nationally. In Colorado and nationally, an estimated 40 – 60% of all K-12 students have access to CS education. Our CS majors who pursue a Teaching minor with a focus on CS will be able to earn CS teaching licensure and also be academically qualified to teach K-12 math, science, and engineering. This is a residential course, meeting in-person 1 time each week.*

#### CS564: CAPSTONE CURRICULUM DESIGN I – PRACTICUM

*Creating an opportunity for Mines students to become highly-qualified science, engineering, math, computer science or STEM teachers lies at the heart of the Mines@150 goals. Bringing students with technical backgrounds into our local classrooms allows these students to share their passion in a way that meets societal needs and at the same time builds their leadership and communication skills. Providing an option for Mines students to pursue teaching as a career will increase retention and recruitment, both by bringing in and retaining those who decide they want to teach as well as by placing informed Mines ambassadors into K-12 classrooms. Additionally, these courses are attractive to career changers who are looking to transition from technical careers into the teaching profession. This course is mixed face-to-face so that students may experience the classroom firsthand but can engage with their Mines' instructor virtually.*

#### CS565: CAPSTONE CURRICULUM DESIGN II – STUDENT TEACHING

*Creating an opportunity for Mines students to become highly-qualified science, engineering, math, computer science or STEM teachers lies at the heart of the Mines@150 goals. Bringing students with technical backgrounds into our local*

*classrooms allows these students to share their passion in a way that meets societal needs and at the same time builds their leadership and communication skills. Providing an option for Mines students to pursue teaching as a career will increase retention and recruitment, both by bringing in and retaining those who decide they want to teach as well as by placing informed Mines ambassadors into K-12 classrooms. Additionally, these courses are attractive to career changers who are looking to transition from technical careers into the teaching profession. This course is mixed face-to-face so that students may experience the classroom firsthand but engage with their Mines' instructor virtually.*

**MOTION:** The motion to approve all new CSED courses was moved by Uwe and seconded by Yaoguo. The motion to approve all new CSED courses was approved with 15 approved, 0 opposed, and 0 abstentions.

**2.2 MAED Sabina Schill**  
 [CIM 12/12]  
**1 course deactivation:** MAED535: COMPUTER SCIENCE TEACHING TECHNIQUES

*We are also proposing some new Computer Science Education (CSED) courses that are currently being taught under the Math Science Education (MAED) course prefix. We are simply aiming to separate Computer Science from Math via a new course code prefix.*

With Teach@Mines, we are introducing these courses with new course codes to provide more clarity to students to take courses specific to their licensure that we offer at Mines.

**MOTION:** The motion to approve the MAED535 deactivation was moved by Uwe and seconded by Yaoguo. The motion to approve the MAED535 deactivation was approved with 16 approved, 0 opposed, and 0 abstentions.

**2.3 CCUS Erik Menke**  
 [CIM 11/16; Provost 11/16]  
**1 new course:** CCUS598: CLASS VI WELL DESIGN AND PERMITTING

*This course is an addition to the CCUS graduate certificate program. As the CCUS certificate program has expanded into a potential stacked certificate or ultimately a master's degree, additional course content is needed. This course focuses on the development of Class VI wells used in CCUS projects. The course is being added as a request of the CCUS team to expand topics in the well construction area.*

[CIM 11/30]  
**2 course changes:** CCUS525: BIOLOGICAL CARBON CAPTURE AND CONVERSION  
*Added pre-requisites to course after discussion with Tina Voelker.*

CCUS530: THE KINETICS OF CARBON DIOXIDE REACTIONS  
*Added pre-requisites to course after discussion with Tina Voelker.*



**MOTION:** The motion to approve the CCUS new course and course changes was moved by Lori and seconded by Suveen. The motion to approve the CCUS new course and course changes was approved with 16 approvals, 0 opposed, and 1 abstention.

**2.4** **AMS** Doug Nychka

[CIM 11/21]

**1 course change:**

DSCI530: STATISTICAL METHODS I

*Changing the prerequisite requirement to the correct level of probability knowledge to succeed in this course. Updating the course description to reflect the course content more fully.*

We would like to require the Mines semester course in Probability (MATH334). We are also willing to take equivalent courses taken elsewhere, however, we wanted to make this explicit because we are getting a lot of students who feel like they have taken a Statistics and Probability class, but it does not cover Probability at the level that we need. We do not require a course in Statistics because we feel that DSCI530 will take care of that. In the course, the first module is called Review of Probability with lots of assignments and quizzes. We have found that a lot of students will drop after this first module because they think that they cannot keep up with the class due to not having the required Probability knowledge. If a student is taking 530 in the last 8 weeks, we allow them to enroll in the 16-233k MATH334 with the idea that by the time the 8-week 530 course starts, they will have enough probability to be up to speed.

**Question:** Is this prerequisite intended for undergraduates?

**Answer:** Yes. We would also require it there. 530 does not have a 430 companion so this is a full-on graduate course.

**MOTION:** The motion to approve the DSCI530 course change was moved by Uwe and seconded by Owen. The motion to approve the DSCI530 was approved with 17 approved, 0 opposed, and 0 abstentions.

**2.5** **CEE** Lori Tunstall

**3 new courses:**

[CIM 12/8; Provost 12/9]

CEEN548: STRUCTURAL LOADS

*Structural Engineers will learn about various loads and how they are applied to buildings. Many graduate students took "CEEN446: Structural Loads" as part of their degree requirements. A graduate level course is proposed that builds off this undergraduate offering.*

This course is to accommodate the switch of not being able to take 400-level courses for graduate level requirements. The course has been adapted with some changes to offer it as cross-listed with 448.

[CIM 1/10; Provost 1/10]

CEEN549: INTRODUCTION TO THE SEISMIC DESIGN OF STRUCTURES

*Mines needs to have a viable MS program in structural engineering. This class will be cross listed with CEEN 441, which has the same name. Originally, graduate students could take CEEN441 to count towards their MS and PhD degree, but now that is not allowed. Thus, this class needs to have a 5XX level cross- listing component.*

[CIM 12/8; Provost 12/13]

CEEN532: UNDERGROUND INFRASTRUCTURE

## CONSTRUCTION MANAGEMENT

*This course (delivered twice as CEEN598) is the third course in the Underground Construction and Tunnel Engineering Graduate Certificate Program. It is targeted to reach and connect Mines to working professionals through an online environment. The course will be offered Online. The course was initially developed and approved in 2021 as CEEN598; it was previously offered in Fall 2021 and Spring 2023.*

**Question:** Did we decide to do an expedited process for courses that were previously 400-level courses taught to graduate students counting as graduate content as minor course changes?

**Answer:** I am happy about the fact that departments are acting quickly on making the cross-listed courses to get pushed through to the next catalog. We are a little bit ahead of where we thought we would be to have an expedited process. We had planned to create a simple template to push these types of course changes through but they got ahead of us.

**Comment:** CE wants to try to streamline the process so that graduate students can take these courses in the fall for graduate credit.

**MOTION:** The motion to approve the CEEN new courses was moved by Uwe and seconded by Lori. The motion to approve the CEEN new courses was approved with 16 approved, 0 opposed, and 0 abstentions.

### 3 course changes:

[CIM 11/17]

CEEN542: DESIGN OF WOOD STRUCTURES

*Faculty decided to split wood and masonry design in order to cover more advanced wood design topics. There is a new faculty who will teach a new masonry design class.*

There will be no overlap with any other department except CEE, and the faculty has already approved this.

[CIM 12/8]

CEEN582: VADOSE ZONE HYDROLOGY

*We are replacing an old, deactivated listing with this new course. Vadose Zone Hydrology provides the fundamental scientific principles governing hydrological processes in the earth's shallow subsurface environment. These principles will prepare graduate students for the needed life-long knowledge for advancing new knowledge and innovative solutions encountered in managing sustainable natural and built environment.*

This course used to be offered in geology but has not been taught for over a decade, and the faculty has sent left. It was discussed that we should open this course for our CE students as well as environment and hydrology students.

[CIM 12/11]

CEEN591: EROSION CONTROL AND LAND RESTORATION

*Replacing an old, deactivated listing to add grad level cross-listed course with CEEN491.*

**MOTION:** The motion to approve the CEEN course changes was moved by Uwe and seconded by Lori. The motion to approve the CEEN course changes was approved with 16 approved, 0 opposed, and 0 abstentions.

2.6

QBE

Nanette Boyle

[CIM 1/10]

1 program change:

MSPHD-IBIO: MS & PHD IN

QUANTITATIVE BIOSCIENCES AND  
ENGINEERING

*The QBE department was unable to find an instructor for BIOL501 the students were told to register for physical biochemistry CHGN 598B. After a staff meeting, the department has decided to make this a permanent change. A new course number will need to be created once this goes through Grad Council.*

We want to swap Advanced Biochemistry for Physical Biochemistry. The reason behind this is we are having a hard time staffing Advanced Biochemistry because of some loss of faculty in that area. Physical Biochemistry is also more quantitative, so it fits in better with the QBE program. The permanent course number for Physical Biochemistry is CHGN535.

**MOTION:** The motion to approve the MSPHD-IBIO program change was moved by Uwe and seconded by Rena. The motion to approve the MSPHD-IBIO program change was approved with 16 approved, 0 opposed, and 0 abstentions.

2.7

CSM

Wendy Winter-Searcy

[CIM 12/20; Provost 12/20]

**1 new course:**

CSM550: NAVIGATING THE CAREER  
SEARCH FOR GRADUATE STUDENTS

*Professional development for graduate students is an imperative to provide a signature experience for graduate students electing to enroll at Mines. Evidence exists that graduate students would appreciate and benefit from a customized career-oriented course. The content from CSM 250 Engineering Your Career Path will be adapted for a graduate student audience, whether master's Non-Thesis, Thesis, or PhD, with an emphasis on paths in industry, research, or academia. The undergraduate course has been offered successfully for the past eight years.*

The Career Center has offered an equivalent course at the undergraduate level for about eight years, CSM250. The undergraduate course is offered both in fall and spring with four sections which are typically full. We have a few graduate students that enroll every semester and during their student evaluations, we received feedback that they would appreciate a course like this that is more customized to their job search and career search process, whether they are going into academia, research, or industry. Therefore, we would like to propose this course that is designed specifically for graduate students to develop their professional development and career skills.

**Question:** What is the credit hour of the course?

**Answer:** It is a 1-credit hour course.

**Question:** Who is teaching the course?

**Answer:** This would be taught by the Career Center professional staff. The CSM250 course is taught by the staff in the Career Center as well as some campus partners.

**Comment:** Many grants are paying tuition for courses specifically counted toward the degrees. If the new tuition model goes into effect, that will get rid of the flat rate, and they may be more cognizant of what they are paying for. Some may support it, and some may not if it is not actually counting toward their degree.

**Comment:** We have discussed some options for that and are open to some possible ways to make it feasible for students to be able to take this course.

**Question:** Shouldn't this be a service that is offered through the Career Center instead of a cost for credit?

**Answer:** Yes, the service is available on an individual basis for graduate students. The advantage of offering it in a course format is packaging all the material so it is a complete offering so that students can gain the skills they might not otherwise pick up along the way. We do the same for undergraduate students where we have a course available and workshop not for credit. By far, the class gets better attendance and better evaluations so we do feel the formalizing of this material into a course is something that would be unique to Mines and would be a signature student experience to enhance their professional development.

**MOTION:** The motion to approve CSM550 was moved by Wendy and seconded by Lori. The motion to approve CSM550 was approved with 16 approved, 0 opposed, and 0 abstentions.

2.8

CEE

Timm Strathmann  
Lori Tunstall

[CIM 1/24; Provost 1/24]

**1 new course:**

CEEN586: HYDROMETEOROLOGY

*This course supports the Mines@150 initiative to “re-align our programs portfolio with the future and expand offerings”. Mines does not currently have an atmospheric science department (or equivalent), and yet Earth exploration and engineering fields have important interaction with the atmosphere. This course provides graduate students (and advanced undergraduates) with training in key atmospheric processes relevant to society and the environment. Course materials cover many physical processes relevant to extreme conditions and the projected changes facing society.*

**MOTION:** The motion to approve CEEN586 was moved by Lori and seconded by Rena. The motion to approve CEEN586 was approved with 14 approved, 0 opposed, and 1 abstention.

2.9

SPACE RESOURCES

Angel Abbud-Madrid

[CIM 1/30; Provost 1/30]

**1 new course:**

SPRS508: REGOLITH PROPERTIES AND PROCESSING

*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 provides a deep look at regolith, the layer of unconsolidated rock debris that covers nearly every planetary body in the solar system. Students will gain detailed knowledge of how regolith forms and what its properties are on the Moon, Mars, and asteroids. In addition, practical aspects will be also covered of how regolith will be used in space resources, and how its properties influence the engineering systems that will interact with this material.*

**2 course changes:**

SPRS503: SPACE RESOURCES SEMINAR

*Change the course delivery from an 8 week to full term (16 week) course. To better serve the students in the program and increase accessibility.*

SPRS591: SPACE RESOURCES PROJECT I

*We are changing the course credits for SPRS594 Space Resources Project I from 2.0 credits to 3.0 credits. The reason why we would like to increase the number of hours is because the amount of material covered, and its deliverables, correspond to a 3-credit-hour course load. The prerequisites of SPRS501 and SPRS502 are being added so that students are fully prepared before taking this course. The content and course description assumes having taken these courses, but they were not formally included as prerequisites. This change will decrease confusion and increase student success in the course.*

**1 program change:** XCRTGMSPHD-SPRSO: GRAD CERT, MS,  
&

PHD IN SPACE RESOURCES

*Clarifies the program requirements, especially for students doing a thesis, and updates the course offerings.*

**MOTION:** The motion to approve the Space Resource new course, course changes, and program change was moved by Lori and seconded by Owen. The motion to approve the Space Resources new course, course changes, and program change was approved 15 approved, 0 opposed, and 0 abstentions.

4:50-4:55 pm **New Business**

4:55-5:00 pm **Adjourn**

Next meeting: March 6, 2024, 4:00-5:00 via Zoom. Please send all agenda items to Soutir Bandyopadhyay ([sbandyopadhyay@mines.edu](mailto:sbandyopadhyay@mines.edu)) and Kristeen Serracino ([kristeen.serracino@mines.edu](mailto: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.

**4.1 ELECTRICAL ENGINEERING**  
[CIM 2/14]

Peter Aaen

**1 course change:**

EENG529: ACTIVE RF & MICROWAVE  
DEVICES

*Our EENG430/530 course introduces the design of passive microwave circuits. These circuits are an essential component of all modern communications and radar systems. While EENG429/529 appears to be a separate topic on active devices, the ability of the students to design and understand an active device, for example, a power amplifier, requires the ability to design and understand passive devices e.g. a matching network. Traditionally, students have self-selected or have been advised to take the courses in the 430/530 then 429/529 sequence and pre-reqs haven't been an issue. However, with increasing interest in the course, we have recently run into situations where students enrolled in 429/529 have not been properly equipped to handle the course contents. These pre-req changes are requested to ensure that the students are not overloaded and can be successful in their studies.*

4.2

**GEOPHYSICS**

Yaoguo Li

[CIM 2/14]

**1 course deactivation:**

GPGN605: INVERSION THEORY

*This class is now GPGN510, which was approved for delivery beginning in the 2024-25 catalog year. The last offering of GPGN605 is this semester, Spring 2024.*

**1 program change:**

MSPHD-GPE/GPH: MS & PHD IN  
GEOPHYSICS & GEOPHYSICAL  
ENGINEERING

*GP faculty approved removing a background requirement of a 2nd language proficiency as it is considered outdated in this new age of technology and translation apps. Additionally, this requirement was only applicable to a very small portion of our graduate student population. Half our graduate student population are international and already know two or more languages and most domestic graduate students know a second language due to HS curricula and competitiveness for college acceptance. It's been more of an administrative burden for students and staff than anything.*

*Updated Pre-approved elective courses. Updates to some clarifying statements. Updated 400 level policy; can no longer be used towards a graduate degree effective Fall 2024.*

5.1

**Approval of Minutes** – February 14, 2024

Soutir Bandyopadhyay