

Colorado School of Mines – FACULTY SENATE MEETING MINUTES  
February 27, 2024, 2:00 – 4:00 pm, in Zoom

**Attendees:**

**Voting Members:** 15 total (10 needed for quorum). Quorum was present.

P	Brandon Dugan (Chair)		Vaughan Griffiths (CEE)		Jamal Rostami (MN)	P	Cortney Holles (HASS)
P	Deb Carney (AMS)	P	Soutir Bandyopadhyay (AMS)	P	Ventzi Karaivanov (ME)		Lawrence Wiencke (PH)
	Mansur Ermila (PE)	P	Pat Kohl (PH)		Sid Saleh (EDS)	P	Ning Wu (CBE)
P	Mark Eberhart (CH)	P	Shubham Vyas (CH)	P	Cristian Ciobanu (ME)		

**Other Regular Attendees and Guests**

	Dinesh Mehta (Trustee)	P	Rick Holz (AA)		Paul Myskiw (RO)		Colin Terry (Student Life)
P	Sam Spiegel (Online)		Tim Barbari (OGS)		Lori Kester (EM)		Kristeen Serracino (AA)
P	Auckland Sacco (USG)	P	Deb Jordan (Trefny)	P	Andy Herring (AA)	P	Nicole Becwar (LB)
P	Lauren Guido (GSG)	P	Jon Johnson (Online)		Nichole Bigley (AA)		Karla Perez-Velez (CASA)

**Special Guest(s):** Vibhuti Dave, Danielle Boileau

**Welcome**

Brandon Dugan

Welcome, everyone! I have two announcements. First, it is week 8, so keep an eye on your colleagues and students since it is a busy time. Keep that in mind for everybody, including yourself. Also, we have a new USG student representative in Faculty Senate, Auckland Sacco.

**Approval of prior Meeting Minutes**

Brandon Dugan

**MOTION:** The motion to approve the previous meeting minutes was moved by Shubham and seconded by Mansur. The motion to approve the previous meeting minutes was approved with zero opposed and zero abstentions.

**Academic Affairs**

Rick Holz

Just a reminder, we are three weeks away from Spring Break, but we are in the throes of a busy time of the semester. As Brandon mentioned, try to take some time for yourselves and make sure your colleagues are as well. We have an upcoming ribbon cutting event for the Beck Venture Center on April 4<sup>th</sup>. The time has not been established yet. As I get more information, I will share that with you hopefully before Spring Break. Otherwise, keep an eye on the Daily Blast. There is talk about having it a noon but there is an additional event happening that evening so they may delay it to around 2 pm to pair the events. The ribbon cutting for Labriola Innovation Complex was fantastic and very well attended with lots of giveaways. If you haven't seen Labriola yet, I encourage you to walk through it.



- **Comment from Brandon:** We have a tour scheduled for Tuesday, March 5<sup>th</sup> from 2:00 pm to 3:00 pm for the Senators. We will try to organize it so that all Senators receive a mug.
- **Comment from Lauren:** April 4<sup>th</sup> is also the final day of GRADS. We have all sorts of people coming from National Labs and we have a new innovation category for GRADS specifically. There is usually some downtime in GRADS between 3:00 pm and 5:00 pm as we process results so there will be lots of people from campus and outside campus with free time in that timeframe.
- **Comment from Rick:** I will let Peter and Brian know about GRADS and maybe that would be a better time to do the ribbon cutting.

The bookstore contract is up with Barnes and Noble this summer. What we have determined is that very few students buy books in the bookstore, but mostly buy them online (for a cheaper price). It could be likely that there will no longer be books in the bookstore anymore. This will be a change for faculty. I do not think that we will be renewing our contract with Barnes and Noble. That decision has not been made yet, but it seems like we are leaning that way. If so, the bookstore will mainly have apparel and school supplies only. If there are any major concerns, please let me know as you socialize with your colleagues. There is a committee in place that is currently working on what the bookstore will morph into in the future.

- **Comment from Ventzi:** In many courses, we tend to use the online components of textbooks. We can maybe set up the courses in such a way that students can get the textbook here or they can buy access to Wiley. The second option would be to utilize the First Day program in which students get deals on tuition and they have access to the content instead of purchasing books online. With First Day, the bookstore is still involved.
- **Comment from Deb:** We looked into First Day in Math, but found it was more expensive for the students, so we direct students to Pearson or to the bookstore. I thought that some students with financial aid packages and scholarships must purchase textbooks through the bookstore.
- **Comment from Rick:** Students with financial aid packages/scholarships are being considered as we make these decisions. Andy Herring is sitting on this committee for AA. As they discuss things, he will bring it back to the Senate to report clarifications. I will make a note of these suggestions for him to make to the committee. Thank you for your feedback and suggestions.
- **Comment from Courtney:** NHV has a custom book that is always sent to the bookstore. I wonder how that would work for this situation in the future.
- **Comment from Rick:** The committee is cognizant of that and are trying to find a workable solution. The State is pushing to utilize free textbooks and materials as much as possible. The library has done a great job of pulling those resources together, so I think that is a part of this conversation that as faculty, we are going to have to talk about how we can utilize things that are no cost to the students to provide what they need when it is feasible. I think that will bring that back into context and we will have to get the library working on that too.

As an experiment for the fall, we are going to attach a waitlist to every class at 20 students. The reason is we want to try to collect some data. Oftentimes, we have students who need courses but cannot get in. We do not know how badly they need the course until it is too late. The semester already starts, and we find students scrambling and writing emails to the President to get into a class. What we thought we would do is make waitlists (even though a vast majority will not have any students in them) and then if we have a waitlist that grows to 20, we can have the conversation to find funding to open a new section and establish the resources to do that (find an instructor, find a room, etc.). We are looking at ways to help students navigate their time here and ensure that we offer the courses that are needed to graduate on a four-year timescale.

- **Question from Deb:** We are already utilizing waitlists in Math. I thought it was the case that students can be in a class still get on a waitlist, so it was not useful because double counting was



going on. Do you know how these waitlists are going to work? If somebody is in a class, will they be denied?

- **Answer from Rick:** Students can still put their name on another waiting list. The Registrar, Deans, and I met to talk about that issue exactly because it was raised. Last year, for those classes that were waitlisted, there were about 25 students who did that, so it was a small number. So, I think we will be sure to monitor that. We plan to have a waitlist for every class to get a better sense of how big that issue is. Right now, it looks like it is a non-issue, so we will see it as an experiment and collection of data if we can do a better job of scheduling. We do have some data that says that we have a backlog of 1,400 students who need to take a 400-level HASS class to graduate, and we do not offer nearly that many seats. However, there are some classes that do not fill so we are a little confused as to whether that is a true backlog. Also, we are trying to collect more data about who is transferring credits from say, community colleges to meet those requirements. I think the waitlist will give us a better sense of which classes are the most popular, which are not very popular, and those that we need to add more sections to. Since waitlists are already happening in some departments, it may not change anything for some, but it will provide some additional information. For departments who do not do waitlists, this may provide some insight into how we can better serve our students, which is our goal.
- **Comment from Lauren:** A lot of students, especially with the 400-level HASS class, will get on waitlist for other courses simultaneously. Therefore, you could potentially have one student on nine HASS waitlists. Will you consider that as well?
- **Comment from Rick:** Yes, we plan to monitor this. This is why we had the Registrar go back and investigate this. They only found about 25 students. We hope by monitoring this that if there are hundreds of students on multiple waitlists, we would need to think about a policy around waitlists. However, we first are going to see what the data tells us for a few semesters and then we can adjust going forward.
  
- **Question from Deb:** Who has oversight of the schedule?
- **Answer from Rick:** The Registrar does. They have software that assists in getting the most efficient schedule possible so that we get the most advantage based on class sizes and classroom availability.
- **Answer from Brandon:** I think the deans also have some oversight of the schedule. For example, we receive a notification from our dean saying which courses are underenrolled. However, they probably receive this information from the Registrar.
  
- **Question from Deb:** As far as deployment of faculty and faculty loads, does that get looked at regularly by semester?
- **Answer from Rick:** Yes. By semester, the deans look at teaching loads and then it all comes to me. I tend to look at ones where the teaching loads look light. Sometimes, there are reasons for that such as sabbaticals or course releases. We do try to make sure that teaching loads across the board are as consistent and equitable as possible. If there is a faculty member who has a heavier load one year, we then try to even it out. Teaching is probably more of a three to five-year cycle, so we try to average over that timeframe and make sure everyone is doing something similar. However, this is difficult for departments like Mechanical and Computer Science because they do not have a single course that has less than 50 students enrolled.
- **Question from Mark:** When you look at Mechanical and Computer Science, do you look at contact hours?
- **Answer:** Yes. Contact hours are part of the equation. It is not in the Handbook, but it is a data point that we look at to see what people's student/credit hour load is since it varies by department. For



example, Math teaches the most student/credit hours (20% larger than any other department on campus).

- **Comment from Ventzi:** Regarding the software that the Registrar uses for scheduling, I have found that it will make changes that do not make sense. I am assuming it makes these changes based on historical data, but things change. And so, you end up with two sections of the same course that are back-to-back and across campus. What happens is we end up switching with other departments to try to deal with these issues.
- **Comment from Rick:** I will talk to Paul about that because his office is the one that does that. We want to minimize these issues to prevent confusing students. There are some faculty who refuse to teach where they are assigned. We try to accommodate that but given that we have not added many classrooms but have grown significantly, we do not have as much flexibility. Classrooms tend to be heavily used from 8:00 am to 6:00 pm and we try to not to offer any single section courses between 3:00 and 6:00 pm to avoid conflict with student athlete schedules.
- **Comment from Deb:** To add, I think we are also dealing with inadequate classroom space.
- **Comment from Rick:** I think you are all aware of the new classroom building that is being built next to the parking garage. There will be eight classrooms there and will look similar to the classrooms in CoorsTek that can be split in the middle to become two 40-student classrooms. There will also be a larger classroom on the first floor that will seat around 200. These should be open by the start of the spring semester next year and will provide necessary relief in classroom space.
- **Comment from Brandon:** I know that Paul has been thinking a lot about room availability but also about matching the right room for the right classes.

**Registrar’s Office**

Not present/no updates.

Paul Myskiw

**Undergraduate Council Updates**

The Undergraduate Council met on February 14<sup>th</sup>. We have a meeting scheduled for tomorrow as well. We had seven program changes and two core course changes that require Faculty Senate vote today.

Ventzi Karaivanov

1.1

AMS		Mike Nicholas
CIM 12/8/23		
<b>2 Program Changes:</b>	BS-AMS: BS in Applied Mathematics and Statistics	
	<p>We are introducing a Data Science (DS) emphasis to go along with our Computational Applied Mathematics (CAM) and Statistics (STAT) emphases. Data Science is an important component of applied mathematics and statistics and is therefore a good fit for AMS. The emphasis overlaps in various courses with the CS track in Data Science; having this emphasis allows students the flexibility of building DS skills on a mathematics foundation rather than a CS foundation. This flexibility reflects the breadth of the field of data science. Since this emphasis relies on already existing courses, we do not anticipate a need for additional resources (beyond the resources we already need, of course).</p>	



	This also includes flowchart changes to get EB321 into the junior year.
UGC Vote Results	<b>MOTION:</b> Motion to approve the BS-AMS program change by Micha and seconded by Jeff. The motion to approve the BS-AMS was approved with 13 approved, 0 opposed, and 0 abstentions.
	MINASI-AMS: Minors/ASIs in AMS – CAM and Statistics
	We have had three minors: Computational and Applied Math, Statistics, and General Math. This leads to a lot of override requests from people in one minor who are interested in courses from another. We have decided to simplify and just offer a single Applied Mathematics and Statistics Minor. Students will be able to build that minor with flexibility.  We are also cutting the ASI. Students are not doing the ASI anyway.
UGC Vote Results	<b>MOTION:</b> Motion to approve the MINASI-AMS program change by Micha and seconded by Jeff. The motion to approve MINASI-AMS program changes was approved with 13 approved, 0 opposed, and 0 abstentions.

**MOTION:** Motion to approve both AMS program changes by Deb and seconded by Ventzi. The motion to approve both AMS program changes was approved unanimously with zero opposed and zero abstentions.

<b>University Honors and Scholars Programs (HN)</b>		Sabina Schill
CIM 12/15/23		
<b>1 New Program:</b>	Minor in Teaching with Licensure	
	<p>In order to provide attractive pathways for current (and future) Mines students and alumni to pursue teaching science, mathematics, and computer science as a career, we would like to create a new minor that is an update on the existing Teach@Mines Minor in Teaching and includes 24 credits rather than 18, which provides students with the option to receive the minor plus the necessary credits required for a teaching license. By offering a minor with licensure option, it will provide clear communication to the campus about the necessary coursework to meet the Colorado Department of Education requirements for initial teacher licensure.</p> <p>Creating an opportunity for Mines students to become highly-qualified and licensed science, math, and computer science teachers addresses 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</p>	



	<p>into K-12 classrooms which will create a better prepared and larger candidate pool for the next generation of Mines incoming students.</p> <p>The coursework for this program is delivered both online and in person with a substantial K-12 classroom component.</p>
UGC Vote Results	<b>MOTION:</b> Motion to approve the Minor in Teaching with Licensure program by Micha and seconded by Jeff. The motion to approve the Minor in Teaching with Licensure program was approved with 12 approved, 0 opposed, and 0 abstentions.
<b>1 Program Change:</b>	MIN-TEACH: Minor in Teaching
	<p>Creating an opportunity for Mines students to become highly-qualified science, engineering, mathematics, computer science, or STEM teachers lies at the heart of the Mines@150 goals. 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.</p> <p>Updates to the Teaching Minor are: 1) The addition of Computer Science Education courses under the new course prefix CSED, which will provide clarity for students who choose to pursue a teaching minor and are focused on Computer Science. 2) The addition of more options for the required Capstone I course, which will provide students in the minor options for engaging in classroom teaching focused within their STEM discipline of choice: Science (SCED464), Math (MAED464), or Computer Science (CSED464).</p>
UGC Vote Results	<b>MOTION:</b> Motion to approve the MIN-TEACH program change by Micha and seconded by Jeff. The motion to approve the MIN-TEACH program change was approved with 13 approved, 0 opposed, and 0 abstentions.

**Question from Shubham:** Do we have any statistics on how many students in this program go on to become high school teachers?

Answer from Ventzi: This was a question brought up last time this was presented. There are about 14-15 students that are currently enrolled in the Licensure program courses.

**Answer from Rick:** The very first person to enroll in the Teaching Master's program just graduated. There are about 14-15 students that are in the Licensure program and 40-50 students who are taking classes that are related to Teach@Mines so it is a growing program.

**Answer from Ventzi:** There are 45 students that are working pursuing the minor program.

**MOTION:** Motion to approve both HN programs was moved by Mark and seconded by Deb. The motion to approve both HN programs was unanimously approved with zero opposed and zero abstentions.

CSM		Colin Terry
CIM 12/11/23		
<b>1 New Course:</b>	CSM301: Introduction to Public Speaking & Communication Skills	



	<p>This new course - taught and facilitated through the Vallejo Irvine Program for Professional Development (VIP) - advances Mines aspiration to equip all graduating students with the necessary professional readiness competencies to positively distinguish themselves in their professional and graduate pursuits. This course introduces students to fundamental public speaking and verbal communications skills and advances Mines' commitment to professional development.</p>	
UGC Vote Results	<p><b>MOTION:</b> Motion to approve CSM301 by Micha and seconded by Jeff. The motion to approve CSM301 was approved with 12 approved, 0 opposed, and 1 abstention.</p>	
CS		Zibo Wang/ Christine Liebe
CIM 12/13/23		
<b>1 Course Change:</b>	CSCI128: Computer Science for STEM	
	<p>This online course is considered part of the new Mines Core, and thus designated an essential class for all students studying at Mines. Increasingly each year, our society relies on computing technology to accomplish daily tasks. This is even more true for scientists and engineers in STEM fields. However, simply knowing how to use computers is not enough. Capable professionals must also know how to program computers to make the best use of them. This course will teach the basics of computer programming, targeting students with no prior experience. It will teach fundamentals that are necessary to program in any language, as well as data analysis techniques that will be applicable to all STEM students, regardless of their intended major.</p> <p>OL version: Liebe completed FOCD in Spring 2021. We expect the online CSCI128 version to be completed in April 2024 for the Summer 2024 semester. We plan to offer the course on June 24, 2024 as an 8-week version. We would like the course to be open for registration in April or early May.</p>	
UGC Vote Results	<p><b>MOTION:</b> Motion to approve CSCI128 course change by Micha and seconded by Jeff. The motion to approve CSCI128 course change was approved with 12 approved, 0 opposed, and 0 abstentions.</p>	

**Question from Deb:** Does the CSCI128 require instructor approval? What are the rules for the summer offering?

**Answer from Ventzi:** I think that was mentioned but I do not know what they have in place. However, the course change mentions open registration.

**Comment from Brandon:** I will reach out to Rob to verify this information. I think they do have some criteria in place to make sure students do not try to skip out of this class to take the online summer version.

**MOTION:** Motion to approve both CSM301 and CSCI128 was moved by Shubham and seconded by Mansur. The motion to approve CSM301 and CSCI128 was unanimously approved with zero opposed and zero abstentions.



<b>EBGN</b>		Andrew Pederson
CIM 1/3/24		
<b>1 Program Change:</b>	MIN-BUEN: Minor in Business and Entrepreneurship	
	Editing the list of electives for the minor due to course additions and subtractions, and changing the requirement for EBG201 and replacing that requirement with EBG360, Introduction to Entrepreneurship.	
UGC Vote Results	<b>MOTION:</b> Motion to approve MIN-BUEN program change by Micha and seconded by Jeff. The motion to approve MIN-BUEN program change was approved with 12 approved, 0 opposed, and 0 abstentions.	
<b>EBGN</b>		Andrew Pederson
CIM 1/3/24		
<b>1 Program Change:</b>	BS-BEMS : BS in Business Engineering and Management Science	
	This version includes the change that was passed F23 to require EBG201. This version also includes a program change adding a Management course to the Business core, reducing the tracks by 3CH each, and increasing Free Electives from 9-12.	
UGC Vote Results	<b>MOTION:</b> Motion to approve BS-BEMS program change by Micha and seconded by Jeff. The motion to approve BS-BEMS program change was approved with 12 approved, 0 opposed, and 0 abstentions.	
<b>EE</b>		Hisham Sager
CIM 1/3/24		
<b>1 Program Change:</b>	BS-EE: BS IN ELECTRICAL ENGINEERING	
	Adding language about approval to count EE graduate courses as undergraduate EE electives. Clarifying language for the combined program.	
UGC Vote Results	<b>MOTION:</b> Motion to approve BS-EE program change by Micha and seconded by Jeff. The motion to approve CS was approved with 12 approved, 0 opposed, and 0 abstentions.	

**MOTION:** Motion to approve the two EBGN program change and one EE program change was moved by Shubham and seconded by Soutir. The motion to approve the two EBGN program change and one EE program change was unanimously approved with zero opposed and zero abstentions.

During our last meeting, there was also an agenda item introduced to update electives and catalog language for the Core Curriculum. This proposal is adding CSM102, Introduction to Technical Writing, and CSM301, Introduction to Public Speaking & Communication Skills, as elective options for the Success and Wellness category. The language update is in the advising guidelines regarding EBG321 versus EBG201. We plan to vote on this during tomorrow's meeting and bring it to a vote for the next Faculty Senate meeting. Upcoming curriculum items that Undergraduate Council is discussing are a program change in the





BS in Computer Science program, which is updating their tracks, a course number change for CEE, and an AMS course change.

**Question from Deb and Rick:** For the BS in Computer Science program change, what is MATH439 and MATH433?

**Answer from Ventzi:** MATH439 is Survival Analysis which is no longer offered. MATH433 is Time Series and its Applications which was just approved by Undergraduate Council.

## Graduate Council Updates

Soutir Bandyopadhyay

### 2.1 GE

[CIM 9/29]

#### 1 program change:

XMS-GISG-NT: MSNT IN GIS &  
GEOINFORMATICS

*Growing online MS-NT programs is in line with Mines @150 mission. This request adds two new (or newer) online courses to the program.*

**GC VOTE RESULTS:** Motion to approve XMS-GISG-NT course change by Adrienne, seconded by Yaoguo. Motion to approve XMS-GISG-NT course change was passed unanimously with zero abstentions.

**MOTION:** Motion to approve

### 2.2 ENERGY

[CIM 2/9]

#### 1 program change:

Valerie Holt

MSPHD-AES: MS & PHD IN ADVANCED  
ENERGY SYSTEMS

*Minor program changes to clean up language. Adding PhD Seminar to engage PhDs is research presentations.*

**Approved 2/7 via consent agenda**

### 2.3 ELECTRICAL ENGINEERING

[CIM 2/9]

#### 1 program change:

MSPHD-EE18: MS & PHD IN ELECTRICAL  
ENGINEERING

*Updated course prefix to EENG. Removed language about 400-level course allowance in graduate programs. Updated Energy and Power Systems to correct name: Power and Energy Systems.*

**Approved 2/7 via consent agenda**

### 2.4 GEOPHYSICS

[CIM 2/23]

#### 1 program change:

Yaoguo Li

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.*

**Approved 2/21 via consent agenda**



## 2.5 UCTE

[CIM 2/23]

### 1 program change:

Gabriel Walton

MSPHD-UEEG: MS & PHD IN  
UNDERGROUND CONSTRUCTION AND  
TUNNELING ENGINEERING

*Bringing program into alignment with guidelines to no longer have UG courses be part of a graduate degree.*

**Approved 2/12 via consent agenda**

## 2.6 GEOPHYSICS

[CIM 2/6]

### 1 program change:

Yaoguo Li

XCRTG-NRGeo: GRADUATE  
CERTIFICATE IN ENERGY GEOPHYSICS

*Adding an additional class (SYGN 598 - Introduction to Geothermal Resources) to the certificate to offer more diverse options for those interested in the program.*

**Approved 2/14 via consent agenda**

## 2.7 QUANTITATIVE BIOSCIENCES AND ENGINEERING

[CIM 1/10]

### 1 program change:

Nanette Boyle

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.*

**GC VOTE RESULTS:** 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 unanimously passed with zero opposed and zero abstentions.

## 2.8 MECHANICAL ENGINEERING

[CIM 1/30]

### 1 program change:

Owen Hildreth

XCRTGMSPHD-SPRSO: GRAD CERT, MS &  
PHD IN SPACE RESOURCES

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

**GC VOTE RESULTS:** Motion to approve the XCRTGMSPHD-SPRSO program change was moved by Lori and seconded by Owen. The motion to approve the XCRTGMSPHD-SPRSO program changes was unanimously passed with zero opposed and zero abstentions.

**MOTION:** Motion to approve all GC items was moved by Mark and seconded by Mansur. The motion to approve all GC items was passed unanimously with zero opposed and zero abstentions.

## **UPCOMING PROGRAM CHANGES AWAITING GRAD COUNCIL APPROVAL**

## 2.1 COMPUTER SCIENCE

[CIM 1/17]

### 1 program change:

Dong Chen

MSPHD-CS: MS & PHD IN COMPUTER



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## 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.*

2.2

### **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.*

As I did with the Master's in Data Science program, I asked the council representatives to send me a list of questions if they had any concerns regarding this new EE program. So far, all council members are aligned with the new program, and we do not have many concerns. With that, I am hoping to approve this in the next Graduate Council meeting during the first week in March.

**Comment from Brandon:** Please let me know the results of the vote for this program and we will put it on the Faculty Senate agenda. I would like Peter Aaen to be present for that.

### Research Council Updates

Mark Eberhart

We have received half a dozen applications for REI. The closing day for proposals will be Thursday. The total amount we have in award funding is \$120,000. The Research Fusion talks have been announced. We talked last time about the Junior/Senior awards which have been designated and that process is ongoing. We had a meeting with Walt that Brandon can further elaborate on.

**Comment from Brandon:** Mark, Walt, and I met and Mike and Lisa attended as well. We discussed how over the years, the Research Council and Research Advisory Board both carried different roles at different times with some overlapping. We were trying to have a broader discussion as we do some updates to the bylaws and establish what the goal of the Research Council is, what the goal of the Research Advisory Board is, and how they can work together. The quick summary of it was we were all on the broader page that Research Council is thinking of how research faculty or tenure-tenure track faculty that run research programs can be successful, what resources are needed, and what support is needed especially in issues such as lab space, sick leave, and supporting students in the Bridge program. The Research Advisory Board



is thinking much more umbrella such as how do we grow the institution, collaboration with National Labs and NREL, and any bigger issues that come up with faculty. Another way to talk about the difference between the two is Research Council is about scholarships, teaching, and service, whereas the Research Advisory Board oversees PNT-type things such as how can we be successful, how do we get promotions for research faculty and tenure-tenure track faculty.

**Question from Shubham:** Does RAB play any role in figuring out critical areas where we need more hires?

**Answer from Brandon:** I do not think they do that. Rather, they might identify grant opportunities, for example, and ask how Mines can remain competitive in certain areas with course buyouts or additional support such as the need for more faculty.

**Answer from Rick:** Walt's office can go to department meetings or talk to department heads about opportunities with funding agencies and advise to hire additional people in a particular area and then that department can have that conversation. However, faculty hiring is a faculty-centric process that involves faculty discussion and a proposal and then we try to match up resources.

**Comment from Mark:** The Research Advisory Board through Walt's office is looking at institutional goals multi-years out and discussing what Mines should be doing in the future.

#### **Faculty Senate Distinguished Lecture**

Brandon Dugan

2024 Lecture by Robert Kee (March 5, 3:30 PM): Please be sure to attend this event.

Selection of 2025 Distinguished Lecturer: I did talk with the Selection Committee for next year's award. They are currently evaluating. They were hoping to get us a recommendation today, but they have a meeting on Thursday to finalize it. Because of this, I would like to propose we do an electronic review of their nomination and approve it as quickly as possible. Hopefully, on Thursday, I will send a note out to the Senators asking for that. The committee is looking at four candidates. That is small so there was discussion about the best way to announce these things to give people more time for nominations. We could have announced earlier since February is such a busy time. For the future, we could possibly announce in December, send a reminder in January, and then have approval in February. This is something we've talked about throughout semesters of how we can honor people who are doing well. I think part of that would be honoring the people who are nominating them and giving more time to write a nomination and build upon the culture of nominations. I was excited for those who went to the Every OreDigger celebrations which had awards. This year, they had 55 people nominated for different awards and I thought that was impressive. I think we need to keep encouraging people and socializing that.

#### **Discussion, Upcoming Items, and Adjourn**

Brandon Dugan

Labriola tour for Senators (March 5, 2PM, tentative): I will forward this to the other representatives if they would like to join.

2024 Lecture by Robert Kee (March 5, 3:30 PM): As a reminder, this is an open lecture that students are welcome to attend.

GenAI survey results (TBD): Estelle is still processing some of the data. They found some oddities and



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realized that she needs to do a different type of processing. As soon as we get the results, we will share them. In parallel, Vibhuti and Justin are launching another how are people using AI in the curriculum now through the departments and are seeking feedback. If you have an opportunity to talk to people or give feedback, please do so. It is something that I think we will be hearing more about in the next weeks and year about how do we make sure that we are teaching our students how to use GenAI appropriately, how it works, how to be successful using it, and how we are integrating it across our curricula.

By-laws revisions (online document sent to Senators for input): You all have been granted added access to the bylaws. Please add comments before spring break and I will try to straighten them out and bring them back after break.

**Question from Deb:** Where is the link?

**Answer from Brandon:** It is in an email, but I can resend it.

Resources, campus space, well-being (March)

Campus Budget Forum (May 1)

Additional items: After the Handbook meeting that Andy's office held a few weeks ago, there some follow-up questions about how do procedures change in the procedures manual, especially if they get broken out under different categories. I have spoken with Molly Markley about this, and we will have Natalie Vega come talk to Senate about how procedures are changed.

*Next meeting: March 12, 2024, in the Guggenheim Boardroom. Please send agenda items [faculty\\_senate@mines.edu](mailto:faculty_senate@mines.edu) 1 week prior.*

