

Colorado School of Mines – UNDERGRADUATE COUNCIL AGENDA  
February 23, 4:00-5:00 pm via Zoom

**Attendees:**

**Voting Members:** 19 total (11 - majority needed for quorum). Quorum was present

P	Jeff King (chair)	A	Andrew Pederson (EB)	P	Mike Nicholas (AMS)	P	Mona El Helbawy (EE)
P	Michael Barankin (CBE)	P	Jay Straker (HASS)	P	Corinne Packard (MME)	A	Nicole Smith (MN)
P	Dylan Domaille (CH)	A	Ge Jin (GP)	P	Jeff Paone (CS)	P	Bruce Trudgill (GE)
P	Linda Battalora (PE)	P	Hongyan Liu (CEE)	P	Oyvind Nilsen (ME)	A	Ethan Lewellin (USG)
P	Gyasi Evans (LB)	P	Chelsea Salinas (EDS)	P	Tim Ohno (PH)		

**Other Regular Attendees and Guests**

A	Fran Aguilar (MS)	P	Dixie Cirillo (PA)	A	Jennie Kenney (AA)	A	Kendra Stansbury (RO)
P	Karla Perez-Velez (CASA)	P	Vibhuti Dave (UGS)	P	Mara Green (AA)	P	Paul Myskiw (RO)
P	Deb Jordan (Trefny)	A	Josh Ramey (QBE)	A	Cheryl Medford (GE)	A	Terri Snyder (PE)
P	Katie Ludwin (CASA)						

**Special Guest(s):** Ian Lange (EB), Richard Krahenbuhl (GP), Masami Nakagawa (MN), Junko Munakata-Marr (CEE), Lakshmi Krishna (PH)

**Welcome**

Jeff King

**Approval of Minutes – February 9, 2022**

Jeff King

**MOTION:** To approve the Undergraduate Council minutes from February 9, 2022 by Barankin, seconded by Straker. Motion passed unanimously.

**Briefings and Information Items**

Office of Undergraduate Studies

Vibhuti Dave

No updates from the Office of Undergraduate Studies.

Registrar’s Office

Paul Myskiw

*Add/Drop Dates*

Myskiw asked Council confirmation on proposing the add date move to the end of week one and maintain the drop date at Census. Comment made to maintain a consistent day for the add deadline for each semester to avoid student confusion; Myskiw suggested the deadline always be on the Monday following the first week of the semester. Council noted the first few semesters may cause an influx of late add forms sent to the Registrar’s Office; if the proposed change causes more harm the language can be rescinded. The topic of changing the add/drop dates was brought to Graduate Council with no controversy. The proposal would be presented to both Councils.

**Curriculum Item(s) for Vote – From 1/26/22**

**Significant Curriculum Changes**

- 1.1 **MINING ENGINEERING**  
[CIM 1/12; Provost 1/12]

Jurgen Brune

**1 new course:** MNGN318: STATICS AND DYNAMICS COMBINED FOR MN  
*The Mining Engineering curriculum was adapted in 2019 to reduce the total number of credit hours from 139.5 to 132.5. This required a reduction in core course hours. Mining Engineering chose to teach the required elements of Dynamics as a 1-CR course MNGN317. DYNAMICS FOR MINING ENGINEERS. (1.0 Semester Hr. (II) For mining engineering majors only. Absolute and relative motions, kinetics, work-energy, impulse-momentum, and angular impulse-momentum.) MN is now moving to combine a 3-CR Statics course with MNGN317 to offer a 4-CR, Statics+Dynamics experience to the Mining Engineering students that includes realistic mining engineering problems, such as statics and dynamics of hoists, conveyor belts, mills, ground support elements, etc.*

King noted discussion in Faculty Senate on the duplication of courses across campus and an increasing degree of awareness; faculty are encouraged to work together across departments to avoid duplications of courses.

**MOTION:** To approve the new course in Mining Engineering, MNGN318: Statics and Dynamics Combined for MN by Barankin, seconded by Nilsen. Motion passed unanimously.

**Minor Curriculum Changes –**

The following minor course changes will not be discussed unless specifically requested by Council.

1.2 **GEOPHYSICS** Ge Jin  
 [CIM 12/21]

**1 program change:** BS-GPE: BS in Geophysical Engineering  
*Recent student feedback indicates that the current single-semester Applied Geophysics course is insufficient to cover applied geophysics methods in the necessary depth. To better prepare the students for their future careers and prepare them for the geophysics summer camp, we propose to extend the Applied Geophysics to two-semester courses: GPGN318 Applied Geophysics I and GPGN319 Applied Geophysics II. The two courses will be offered synchronically with the two other current courses, GPGN 328 Physics of the Earth I and GPGN329 Physics of the Earth II, with one series (328/329) focusing on theories and the other (318/319) focusing on applications. Removal of GPGN350.*

1.2.1 **1 course deactivation:** GPGN314: APPLIED GEOPHYSICS

1.2.2 **2 new courses:** GPGN318: APPLIED GEOPHYSICS I  
 GPGN319: APPLIED GEOPHYSICS II

*Recent student feedback indicates that the current single-semester Applied Geophysics course is insufficient to cover applied geophysics methods in the necessary depth. To better prepare the students for their future careers and prepare them for the geophysics summer camp, we propose to extend the Applied Geophysics to two-semester courses: GPGN318 Applied Geophysics I and GPGN319 Applied Geophysics II. The two courses will be offered synchronically with the two other current courses, GPGN 328 Physics of the Earth I and GPGN329 Physics of the Earth II, with one series (328/329) focusing on theories and the other (318/319) focusing on applications.*

1.3 **BUSINESS AND ECONOMICS** Becky Lafrancois

[CIM 1/17; Provost 1/18]

**2 new courses:** EBG307: BUSINESS COMMUNICATIONS

*Business Communications is a core class in the Business Engineering and Management Science degree program. The BEMS degree was developed to support the Mines@150 goal of increasing business education.*

EBG308: PRINCIPLES OF MARKETING

*Principles of Marketing is a core class in the Business Engineering and Management Science degree program. The BEMS degree was developed to support the Mines@150 goal of increasing business education.*

**MOTION:** To approve the minor curriculum items in items 1.2 through 1.3 in an omnibus Council vote by Barankin, seconded by Battalora. Motion passed unanimously.

### **New Curriculum Item(s)**

#### **Significant Curriculum Changes**

##### 2.1 **CIVIL & ENVIRONMENTAL ENGINEERING**

Junko Munakata Marr

[CIM 2/16; Provost 2/16]

**1 new program:** BS-CTRST: Bachelor of Science in Construction Engineering

*This program ultimately supports multiple Mines@150 goals: to be a leader and preferred partner in producing highly desired STEM-educated leaders, use-inspired research and innovation, and alumni affinity, visibility and involvement. Our existing expertise in geotechnical engineering, innovative construction and structural engineering materials, environmental science and engineering, and hydrology provides a solid foundation to tackle our departmental goal of becoming the go-to institution in addressing the challenge of smart, sustainable urban infrastructure. This program will leverage current strengths at Mines to educate students in the high-demand area of construction engineering. This is specifically appealing to traditional employers of Mines engineering students, as a significant portion of engineering projects become construction projects. The US has only 16 ABET-accredited Construction Engineering B.S. programs, with only three west of Texas (Arizona State, University of New Mexico, and San Diego State); other construction-oriented programs are one ABET-accredited Construction Engineering and Management B.S. program (Virginia Tech) and one ABET-accredited Civil and Construction Engineering B.S. program (U of Arkansas-Little Rock). Mines thus has an opportunity to create an exemplary program in a relatively small competitive landscape, extending the impact of our current programs in advancing Mines@150 priorities to the construction engineering arena. This degree program, in particular, represents a prime opportunity to engage alumni in the project-based curriculum, as their interest has been a driving force behind the program development.*

*This will be a residential program, building on the hands-on, experiential learning that is already part of CEE's two existing degree programs.*

Marr provided an overview of the CEE department and ABET accreditation. CEE endeavors to become a global go-to institutions for research and education in Smart, Sustainable Urban Infrastructure with its reaffirmed 2019-21 strategy to include sustainable construction alongside its strengths in water and hazard risks and mitigation.

The curriculum development process included looking across existing programs for commonalities, aligning with ABET program criteria, aligning with the Fundamentals of Engineering Exam, and build on to the CEE Signature Student Experience (SSE). The proposed curriculum is the same as Civil Engineering through sophomore Fall semester; six new proposed courses distributed through junior and senior years with addition of technical electives. The new program is expected to align with SSE by being more interactive and experimental with project-based learning, field experiences; and industry engagement including guest lectures, field visits, projects, and internships.

Marr noted the needed resources for the program include a professor of practice, T/TT faculty, and TAs/graders for courses. The professor of practice search is underway and will be responsible for the development and delivery of construction courses and solicit internship and course project opportunities. T/TT faculty will oversee the program and lead continual curriculum development and ABET assessment.

Question on the course load for the professor of practice; this new hire would be expected to teach five courses per year. Six new courses are expected, follow-up question on additional faculty to cover the additional course; the course plan is staggered to provide time for course development and hiring of a T/TT faculty to pick up additional courses in the second year. Difficulties not expected for the professor of practice hire, but the tenure line may prove challenging.

Question on existing tenured faculty buy-in; a construction engineering taskforce made up of tenured and teaching faculty provided options, assessed the existing landscape of construction engineering curriculum, and developing what the program should look like.

Councilor noted Faculty Senate discussion on new degree programs highly dependent on one faculty member in the first year.

Question raised on separating the field session on surveying from regular CEE; Marr stated several degree programs at other institutions all required surveying, the CEE field session acts as an introduction to surveying alongside field session. Marr addressed technological updates in surveying, students in field session are taught both traditional and modern tools for surveying.

Question on expected student enrollment; Marr reported an estimated sixty students, fifteen students a year. Marr noted undergraduate interest in the program; Councilor reported undergraduate students being hired from construction management companies following graduation.

Marr will be spearheading the program for now with expectation to pass the program to the professor of practice and, later, the tenure line faculty.

#### **Minor Curriculum Changes –**

The following minor course changes will not be discussed unless specifically requested by Council.

#### **2.2 MECHANICAL ENGINEERING**

Oyvind Nilsen

[CIM 2/16; Provost 2/16]

**1 new course:** MEGN475: INTRODUCTION TO NUCLEAR ENGINEERING

*It advances several areas of Mines@150, including Expanding pathways to Mines and Increasing offerings and options for professionally oriented post-graduate education. This course serves as*

*a streamlined and simplified undergraduate entry point for the Interdisciplinary graduate nuclear science and engineering program for new students who do not have a background in nuclear engineering, which opens up the NE degree program to a wider range of educational backgrounds from outside of Mines and it opens up the Nuclear Engineering 4+1 degree program tracks to more majors from within Mines and allows students to choose to enter the 4+1 program at later points in their undergraduate studies.*

**Continuing Curriculum Item(s)** – From 2/9/22

**Significant Curriculum Changes**

3.1 **COMPUTER SCIENCE**

Jeff Paone

[CIM 1/26]

**5 program changes:** BS-CS: BS in Computer Science  
MIN-COMPE: Minor in Computer Engineering  
MIN-DSCI: Minor in Data Science  
MIN-RIS: Minor in Robotics and Intelligent Systems  
MINASI-CS: Minor/ASI in Computer Science

*Updating courses to align with creation of new course sequence of CSCI 200 -> CSCI 220 in place of CSCI 261 -> CSCI 262.*

3.1.1 [CIM 1/26; Provost 1/26]

**1 new course:** CSCI220: DATA STRUCTURES AND ALGORITHMS

*Last academic year, CSCI 101 was added as a prerequisite to CSCI 261. This change caused approximately two-thirds of the CSCI 261 material to become redundant and a repeat of the material from CSCI 101 with the only change being the programming language used (C++ instead of Python). A new course, CSCI 200 was created to replace CSCI 261 going forward. CSCI 200 is a much more rigorous introduction & application of foundational programming concepts and design. With the combination of CSCI 101 and CSCI 200, students will have a strong foundation of programming after two classes as opposed to the current arrangement of needing three classes.*

*Approximately 40% of the material in CSCI 262 consists of foundational C++ programming topics now covered in CSCI 200. Another 10% consists of introductory Data Structures concepts now covered in CSCI 200. CSCI 220 replaces CSCI 262 and excludes the 50% overlap with CSCI 200. This will permit the course to provide both breadth and depth exploring a greater range of data structures and related algorithms. Students in CSCI 220 will refine programming skills gained in CSCI 101 and CSCI 200 by implementing fundamental data structures and algorithms.*

3.1.2 **21 course changes:** CSCI274: INTRODUCTION TO THE LINUX OPERATING SYSTEM  
CSCI290: PROGRAMMING CHALLENGES I  
CSCI303: INTRODUCTION TO DATA SCIENCE  
CSCI306: SOFTWARE ENGINEERING  
CSCI341: COMPUTER ORGANIZATION  
CSCI403: DATA BASE MANAGEMENT  
CSCI404: ARTIFICIAL INTELLIGENCE  
CSCI406: ALGORITHMS  
CSCI432: ROBOT ETHICS  
CSCI436: HUMAN-ROBOT INTERACTION

CSCI437: INTRODUCTION TO COMPUTER VISION  
CSCI441: COMPUTER GRAPHICS  
CSCI442: OPERATING SYSTEMS  
CSCI470: INTRODUCTION TO MACHINE LEARNING

*Updating pre-/co-requisites to align with creation of new course sequence of CSCI 200 -> CSCI 220.*

CSCI440: PARALLEL COMPUTING FOR SCIENTISTS AND ENGINEERS  
CSCI446: WEB APPLICATIONS  
CSCI471: COMPUTER NETWORKS I  
CSCI473: HUMAN-CENTERED ROBOTICS  
CSCI474: INTRODUCTION TO CRYPTOGRAPHY  
CSCI475: INFORMATION SECURITY AND PRIVACY  
CSCI478: INTRODUCTION TO BIOINFORMATICS

*Updating courses to align with creation of new course sequence of CSCI 200 -> CSCI 220 in place of CSCI 261 -> CSCI 262.*

### 3.2 **ENGINEERING, DESIGN, AND SOCIETY** [CIM 1/24]

Chelsea Salinas

**3 program changes:** BS-EGN: BS in Engineering

*The Bachelor of Science in Engineering Program supports students with a disciplinary background in Design Engineering through multi-disciplinary educational opportunities. Students within the program are required to take design courses every semester through the EDS department. Engineering Fundamentals courses together with more specific Engineering Elective courses deepen technical knowledge for the students. Focus Area electives provide an opportunity for the students to advance their knowledge in fields/areas of which they are most passionate. The focus on design engineering and the multi-disciplinary technical background of the students supports the Mines@150 mission through hands-on, active learning, engineering design, and multi-disciplinary teamwork.*

Councilor noted faculty request of the removal of the CBE senior design from the list of electives in the BS in Engineering.

MIN-ECD: Minor in Engineering for Community Development  
MIN-LSR: Minor in Leadership in Social Responsibility

*To facilitate pathway to graduation, use existing faculty courses more effectively, and maintain the two distinctive flavors of our minors, we proposed an updated structure to the two minors (see CIM page/agenda item).*

### 3.3 **APPLIED MATHEMATICS & STATISTICS** [CIM 1/26]

Mike Nicholas

**6 course changes:** MATH201: INTRODUCTION TO STATISTICS

*Updated course title (Probability and Statistics for Engineers → Introduction to Statistics). This change is to modernize the course content. The probability content will be removed in favor of a statistical approach centered on actual data. Instead of deriving statistical results in terms of probability distributions, results will be discovered via sampling and bootstrapping. This is a more modern approach to teaching statistics that is in line with the recommendations of the American Statistical Association.*

MATH424: INTRODUCTION TO APPLIED STATISTICS

Updated prerequisites. MATH335 added. ("MATH332 or MATH342" removed).

MATH432: SPATIAL STATISTICS

This is routine maintenance for our 400-level stats courses. With 332 no longer a prereq for 424, we want to add it here.

MATH436: ADVANCED STATISTICAL MODELING

With 332 no longer a prereq for 424, we want to add it here.

MATH437: MULTIVARIATE ANALYSIS

Updated prerequisites to include MATH424.

MATH438: STOCHASTIC MODELS

Added prerequisite MATH332.

**Minor Curriculum Changes –**

The following minor course changes will not be discussed unless specifically requested by Council.

**3.4 QUANTITATIVE BIOSCIENCES AND ENGINEERING**

Josh Ramey

[CIM 1/26; Provost 1/26]

**1 new course:** BIOL301: INTRODUCTION TO QUANTITATIVE BIOLOGY II

*This course will extend the applications of quantitative biology, building from the foundation in biological data analysis established in BIOL300. Students will learn how to model biological systems both mathematically and computationally and ultimately compare model predictions to experimental data.*

**3.5 ENGINEERING, DESIGN, AND SOCIETY**

Chelsea Salinas

[CIM 1/19]

**7 course changes:** EDNS191: INTRODUCTION TO INTEGRATIVE DESIGN

*Updated course title (Studio IA → Introduction to Integrative Design) to provide more clarity on course topics and content. No substantial change in course. Updates to breakdown of hours per week as associated with a lab portion to more easily satisfy a transfer between EDNS151 and EDNS191.*

EDNS192: DESIGN AND HUMAN VALUES

*Updated course title (Integrative Design Studio IB → Design and Human Values) to provide more clarity on course topics and content. No substantial change in course. Updates to breakdown of hours per week to more easily satisfy a transfer between EDNS192 and HASS100.*

EDNS200: DESIGN COMMUNICATION

*Updated course title (Communication → Design Communication) and description to provide better clarity on course content. Edited hour designation to better reflect the delivery/modality in terms of studio hours dedicated each week.*

EDNS291: DESIGN UNLEASHED

*Updated course title (Integrative Design Studio IIA → Design Unleashed) and description to provide better clarity on course content. Edited hour designation to better reflect delivery/modality in terms of studio hours dedicated each week.*

EDNS292: DESIGN FOR A GLOBALIZED WORLD

*Updated course title (Integrative Design Studio IIB → Design for a Globalized World) and description to provide better clarity on course content. Edited hour designation to better reflect the delivery/modality in terms of studio hours dedicated each week.*

EDNS391: DESIGN & MODELING OF INTEGRATED SYSTEMS

Updated course title (*Integrative Design Studio IIIA* → *Design & Modeling of Integrated Systems*) and description to provide better clarity on course content. Edited hour designation to better reflect the delivery/modality in terms of studio hours dedicated each week.

EDNS392: SYNTHESIZE DESIGN IDENTITY

Updated course title (*Integrative Design Studio IIIB* → *Synthesize Design Identity*) and description to provide better clarity on course content. Edited hour designation to better reflect the delivery/modality in terms of studio hours dedicated each week.

### 3.6 ENERGY

Dylan Domaille

[CIM 1/25; Provost 1/26]

**1 new course:** ENGY475: INTRODUCTION TO NUCLEAR ENGINEERING

*This course serves as a streamlined and simplified undergraduate entry point for the Interdisciplinary graduate nuclear science and engineering program for new students who do not have a background in nuclear engineering, which opens up the NE degree program to a wider range of educational backgrounds from outside of Mines and it opens up the Nuclear Engineering 4+1 degree program tracks to more majors from within Mines and allows students to choose to enter the 4+1 program at later points in their undergraduate studies.*

### 3.7 HUMANITIES, ARTS, AND SOCIAL SCIENCE

Seth Tucker

[CIM 1/24]

**1 program change:** MIN-CCC: Minor in Culture, Creativity, and Communication  
*Course numbers have changed—they have been updated in the course lists for HASS303 (changed from HASS201 Spring2022), HASS 302 (changed from HASS300 Spring 2022).*

#### 3.7.1 **1 new course:** HASS413: ENVIRONMENTAL FILM

Jay Straker

*This class explores the ways in which films convey competing narratives about the relationship between humans and the environment. Students will learn to analyze and interpret visual culture in order to understand how cinematic narratives have shaped our societal understandings of the so-called “natural” world and our engagement with energy sources.*

#### 3.7.2 **4 course changes:** HASS302: INTERMEDIATE SHORT FICTION WRITING WORKSHOP

*Co-requisite updated to HASS303 or instructor approval.*

HASS400: ADVANCED SHORT FICTION WRITING WORKSHOP

*Updated co-requisites to reflect course number changes: addition of HASS300 and HASS302.*

HASS401: ADVANCED POETRY WRITING WORKSHOP

*Updated co-requisite to include HASS301.*

HASS408: CREATIVE NONFICTION WRITING: LIFE STORIES

*Removal of HASS300 co-requisite; senior level course is needed by too many students to justify having co-requisites.*

### 3.8 APPLIED MATHEMATICS & STATISTICS

Carolyn Freedman

[CIM 2/1]

**2 course changes:** DSCI403: INTRODUCTION TO DATA SCIENCE

*Updated prerequisites to align with recent prerequisite changes to the CSCI303 cross-listed course.*

DSCI470: INTRODUCTION TO MACHINE LEARNING



Updating prerequisites to align with recent prerequisite changes in the CSCI470 cross-listed course.

### 3.9 CHEMICAL & BIOLOGICAL ENGINEERING

Josh Ramey

[CIM 1/26; Provost 1/26]

**1 new course:** CBEN455: INTERNATIONAL GENETIC ENGINEERED MACHINE SEMINAR  
*CBEN455 is a 1-credit hour seminar course that supports the Mines iGEM students in this process through discussions of previous iGEM projects, initial brainstorming of project ideas, discussion of experimental design, training in lab safety and standard molecular biology protocols and team dynamics.*

### 3.10 MECHANICAL ENGINEERING

Oyvind Nilsen

[CIM 2/2]

**1 course deactivation:** MEGN413: AEROSPACE STRUCTURES  
*Replaced by identical course MEGN453 with a new number to match the MEGN number system.*

#### 3.10.1 [CIM 2/1; Provost 2/2]

**1 new course:** MEGN453: AEROSPACE STRUCTURES

*This is a course replacing (exactly) MEGN413. The new course number will be inline with the current MEGN courses within the Aerospace Minor (+ASI).*

### Subcommittee Updates

#### Tracks and Emphasis Definitions

Vibhuti Dave

Discussion with department heads has begun; Dave to meet directly with the DH Council 3/9.

#### Course Learning Outcomes

Vibhuti Dave

No updates from the CLO subcommittee.

### Miscellaneous / New Business

#### Call for new steering committee member

Hongyan Liu volunteered.

#### Request for HNRS198 extension

Lakshmi Krishna

HNRS198A: Entering Research part of a program piloted to engage first-year students in research called the FIRST program; freshman innovation and research scholar training. Course proposal missed the deadline to provide a permanent course number.

**MOTION:** To approve the extension to teach HNRS 198A: Entering Research for Fall 2022 by Lange, seconded by Battalora. Motion passed unanimously.

### Adjourn

Jeff King

Meeting adjourned: 4:48 pm.

Next meeting: March 9, 4:00-5:00 pm via Zoom.