

Colorado School of Mines – UNDERGRADUATE COUNCIL AGENDA
February 9, 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	Becky Lafrancois (EB)	P	Mike Nicholas (AMS)	P	Mona El Helbawy (EE)
P	Michael Barankin (CBE)	P	Jay Straker (HASS)	P	Corinne Packard (MME)	P	Nicole Smith (MN)
P	Dylan Domaille (CH)	P	Ge Jin (GP)	P	Jeff Paone (CS)	P	Bruce Trudgill (GE)
P	Linda Battalora (PE)	P	Hongyan Liu (CEE)	P	Oyvind Nilsen (ME)	P	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)
A	Deb Jordan (Trefny)	P	Josh Ramey (QBE)	A	Cheryl Medford (GE)	A	Terri Snyder (PE)
P	Katie Ludwin (CASA)						

Special Guest(s): Sandy Woodson (HASS), Dean Nieusma (EDS), Ashlyn Munson (AMS), Kevin Moore (EE), Ian Lange (EB)

Welcome

Jeff King

Approval of Minutes – January 26, 2022

Jeff King

MOTION: To approve the Undergraduate Council minutes of January 26, 2022 by Ohno, seconded by Battalora. 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

Continued discussion on add/drop dates; consensus reached on keeping the drop date at Census day and shortening the add date to one week. Concern raised on financial aid when divorcing add and drop dates; Myskiw noted the ability to make exceptions is available, the shorter add window would remove additional faculty work for late additions. Councilor suggested making note of late add form submissions should the add date be shortened.

Mines Online

Request made for clarification on the procedure of who is responsible for approval of course modality changes; Mines Online has an approval process for courses with a Faculty Senate subcommittee on online course standards. Council approves course content, not modality changes. A flowchart for the online course approval process available through Mines Online.

Curriculum Item(s) for Vote – From 1/12/22

Significant Curriculum Changes

1.1 **CHEMICAL & BIOLOGICAL ENGINEERING**

Michael Barankin

[CIM 12/7]

1 program change: BS-CHE: BS in Chemical Engineering

In the current catalog, double counting of the four core courses required for the combined BS/MS program is not allowed. This causes unnecessary confusion among students. Change request to remove this constraint.

MOTION: To approve the program change in Chemical and Biological Engineering to BS-CHE: BS in Chemical Engineering by Barankin, seconded by Packard. Motion passed unanimously.

1.2 **GEOLOGY & GEOLOGICAL ENGINEERING**

Bruce Trudgill

[CIM 12/2]

3 course changes: GEGN330: GEOSCIENTISTS THERMODYNAMICS

Changes to GEGN330 reflect updates to the BS curriculum in GE agreed upon by the faculty in the Department. The faculty evaluated our program objectives, the sequencing of classes, and the connections among learning outcomes in our 200 and 300- level courses. The outcomes of that analysis include eliminating GEGN 206, incorporating select learning outcomes from GEGN 206 into GEGN 212, adding a new course, GEGN 217, and reducing credits for GEGN 317. Our new curriculum has the same number of total credits as the current curriculum. This proposed change, removing the GEGN 206 pre-requisite, reflects the removal of GEGN 206 from our curriculum.

GEOL314: STRATIGRAPHY

Changes to GEOL314 reflect updates to the BS curriculum in GE agreed upon by the faculty in the Department. The faculty evaluated our program objectives, the sequencing of classes, and the connections among learning outcomes in our 200 and 300- level courses. The outcomes of that analysis include eliminating GEGN 206, incorporating select learning outcomes from GEGN 206 into GEGN 212, adding a new course, GEGN 217, and reducing credits for GEGN 317. Our new curriculum has the same number of total credits as the current curriculum.

GEOL321: MINERALOGY AND MINERAL CHARACTERIZATION

Changes to GEOL321 reflect updates to the BS curriculum in GE agreed upon by the faculty in the Department. The faculty evaluated our program objectives, the sequencing of classes, and the connections among learning outcomes in our 200 and 300- level courses. The outcomes of that analysis include eliminating GEGN 206, incorporating select learning outcomes from GEGN 206 into GEGN 212, adding a new course, GEGN 217, and reducing credits for GEGN 317. Our new curriculum has the same number of total credits as the current curriculum. This proposed change, removing the GEGN 206 pre-requisite, reflects the removal of GEGN 206 from our curriculum.

MOTION: To approve the three course changes in Geology and Geological Engineering to GEGN330, GEOL314, and GEOL321 by Trudgill, seconded by Straker. Motion passed unanimously.

Minor Curriculum Changes –

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

1.3 **GEOLOGY & GEOLOGICAL ENGINEERING**

Cheryl Medford

[CIM 12/15; Provost 12/15]

1 new course: GEOL440: PLATE TECTONICS

This is a face to face course for our majors at the undergraduate level. An online graduate level version with different assignments is under construction and will be launched as GEOL598 in Spring 2022. This request is for the undergraduate level course only.

1.3.1 [CIM 12/15]

1 course deactivation: GEOL201: PLATE TECTONICS

This course was added a few years ago before the curriculum was changed. The course does not exist (has not been taught).

1.4 **PHYSICS**

Chuck Stone

[CIM 12/6; Provost 12/7]

1 new course: PHGN461: ELEMENTS OF MODERN OPTICS

This course is designed to prepare students for a variety of goals including enrollment in advanced optics courses at Mines, graduate research opportunities in physics and other closely-related engineering disciplines, and industrial careers in applied optics. Course topics will provide foundational skills vital to all areas of optics, one of the more rapidly growing areas in Colorado's Front Range as well as around the nation.

1.5 **COMPUTER SCIENCE**

Jeff Paone

[CIM 12/15]

1 course change: CSCI445: WEB PROGRAMMING

Changing the prerequisite from CSCI262 to CSCI306. Students will learn event-driven programming in CSCI306 which is critical for designing a user interface, which is at the core of web interaction.

This course is an elective course taken largely by CS seniors and juniors. Students are required to take CSCI306 and would have done so by their junior year.

MOTION: To approve the curriculum changes outlined in items 1.3 through 1.5 in an omnibus Council vote by Ohno, seconded by Barankin. Motion passed unanimously.

New Curriculum Item(s)

Significant Curriculum Changes

2.1 **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.

2.1.1 [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.

- 2.1.2 **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.

Paone provided background on all changes in 2.1. Prior to 2021, CSCI101 did not have a position in the program flowchart and was made into a prerequisite for CSCI261. CS acknowledged significant overlap between CSCI101 and CSCI261 and created CSCI200 which reworked content from CSCI261. CSCI220: Data Structure and Algorithms was added into the flowchart. Updated course flowchart: CSCI101 → CSCI200 → CSCI220. CSCI220 brings concepts from 261 with more advanced algorithms earlier into the curriculum to provide students with a more rigorous introduction to content expected later in the

curriculum. Departments affected by this change are electrical and mechanical engineering students who take CSCI341; previously, CSCI262 was a co-requisite (prerequisite: CSCI261) for CSCI341. The updated flowchart lists CSCI341 with the prerequisite of CSCI200, removing the additional course from EE/ME students' electives list. AMS students taking CSCI403 no longer need the CSCI262 prerequisite, this has been changed to CSCI200.

Question on integration of computer science into Mines' core curriculum; the changes to the CS flowchart were made with this in mind.

2.2 ENGINEERING, DESIGN, AND SOCIETY

Chelsea Salinas

[CIM 1/24]

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.

The proposed changes would clarify technical breadth and depth of requirements, update the engineering elective list to include 300+ engineering electives, and change the design course titles within the major to reflect course content.

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).

Changes to both minors propose restructuring of course requirements, share the required course list between the two minors with the exception of one designated course, and update the elective list to provide more breadth.

Comment made on the elective list including chemical engineering senior design, which would require a significant number of the core sequence; Salinas noted this can be kept on the list for students double-majoring or removed for ease.

2.3 APPLIED MATHEMATICS & STATISTICS

Mike Nicholas

[CIM 1/26]

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.

The proposed changes are to bring the statistics courses in line with the current recommendations from the American Statistical Association and take a more simulation-based inference approach. Removed discussions from MATH201 will be added to the 300-level sequence. Calc II was shifted to Calc I due to these changes. Linear algebra was removed from the 424 so to allow students in 201 to take the course sooner and gain hands on experience.

Minor Curriculum Changes –

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

2.4 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.

2.5 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.

2.6 ENERGY

Dylan Domaille

[CIM 1/25; Provost 1/26]

1 new course: ENGY465: 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.

2.7 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).

2.7.1 **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.

2.7.2 **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.

2.8 **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.

2.9 **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.

2.10 **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.

2.10.1 [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).

Continuing Curriculum Item(s) – From 1/26/22

Significant Curriculum Changes

3.1 **MINING ENGINEERING** Jurgen Brune
[CIM 1/12; Provost 1/12]

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.

Minor Curriculum Changes –

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

3.2

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.

3.2.1

1 course deactivation: GPGN314: APPLIED GEOPHYSICS

3.2.2

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.

3.3

BUSINESS AND ECONOMICS

Becky Lafrancois

[CIM 1/17; Provost 1/18]

2 new courses: EBGN307: 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.

EBGN308: 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.

Subcommittee Updates

Common Exam and other Exam Scheduling

Mike Nicholas

Subcommittee sought to consider moving common exams into the day; subcommittee recognized no further work. Subcommittee considered whether there is potential for a formal recommendation. Subcommittee looked to Council for further guidance on moving forward. Moving common exams into the day would require earlier planning so students registering are aware of these dates and have these times blocked off.

Myskiw commented on the reduction of the number of courses allowed to offer common exams due to the large freshmen class size, the class size will have a cumulative effect and will continue to impact class scheduling moving forward. Noted that the Catalog does not make clear the Registrar's ability to

make exceptions for common exams or what courses are allowed to have common exams. Catalog restricts courses to no more than four evening common exam periods in a single semester. The Catalog language provides the Registrar autonomy to decide whether a common exam is allowed or not.

The request to consider common exams comes from Academic Affairs and related to a resourcing issue. Invitation made to provide a formal proposal.

Tracks and Emphasis Definitions

Vibhuti Dave

Subcommittee progress shared with the college deans and Provost; feedback was provided. Suggested to bring proposal to department heads to inform and gain approval. Further updates from the subcommittee halted to socialize proposal. Additional feedback provided: simplification/rebranding of minors, changes to terminology (use of tracks vs concentration areas), and separation of interdisciplinary areas vs sub-disciplinary areas.

Course Learning Outcomes

Vibhuti Dave

Subcommittee to look at other universities and best practices used to tie ABET and HLC assessment together with CLOs; assess a workflow where CLOs are maintained.

New/Miscellaneous Business

HASS198: Nature and Human Values Shortform Request for Extension

Sandy Woodson

HASS100 is a combination of writing and environmental ethics, HASS recognized students with high AP scores or several hours of composition entered the course and separated the environmental ethics into a shortform course.

MOTION: To approve the extension of HASS198: Nature Values Shortform to be taught in Fall 2022 by Barankin, seconded by Straker. Motion passed unanimously.

Adjourn

Jeff King

Meeting adjourned: 5:04 pm.

Next meeting: February 9, 4:00-5:00 pm via Zoom. Please send all items for agenda to mgreen1@mines.edu 1 week prior.