Core Curriculum

The Purpose and Definition of the Core Curriculum

The core is the set of classes vertically aligned through four years required of all Mines students. Students complete courses in the core curriculum to develop and strengthen scientific and engineering knowledge, and to explore the contextualization of that knowledge in a sociotechnical, professional, and global community. In addition to foundational knowledge in math and science, the core curriculum also facilitates student success in crucial areas, including personal and professional development, understanding of global and societal contexts, ability to communicate effectively in a variety of settings, and capacity for critical and creative problem solving. To achieve these goals, the core content will be aligned with 26 core competencies. They are designed to advance the integration of pathways for the signature student experience in a way that is scaffolded from the core curriculum through to graduation.

The core curriculum as of academic year 23 - 24 builds on existing strengths within the curriculum, while also providing an expanded range of opportunities for integrative, exploratory, experiential, interdisciplinary, and enhanced hands-on learning. It includes a greater focus on student wellness, with a process for recognizing the importance of activities that facilitate personal growth and encourage a balanced and healthy campus lifestyle. Continuing students should refer to the Appendix section at the bottom of this page to understand updates and review guidelines for degree completion.

The courses in the core curriculum are organized in the following topical areas:

1. Math, Basic Sciences, & Computing
2. Design and Innovation
3. Culture and Society (CAS)
4. Success and Wellness (S&W)
5. Student-Led Inquiry

All students are required to complete the following core course requirements, and they are strongly encouraged to do so in accordance with the schedule outlined by your degree program. Failure to do so may delay a student's ability to graduate. Students should check out Degree Works to verify requirements for your program.

Table 1: List of Core Course Requirements

In Math, Basic Sciences, and Computing		
MATH111	CALCULUS FOR SCIENTISTS AND ENGINEERS I	4.0
MATH112	CALCULUS FOR SCIENTISTS AND ENGINEERS II	4.0
MATH213	CALCULUS FOR SCIENTISTS AND ENGINEERS III	4.0
MATHXXX	Fourth MATH course as specified by degree	3.0
CHGN121	PRINCIPLES OF CHEMISTRY I	4.0
PHGN100	PHYSICS I - MECHANICS	4.0
CSCI128	COMPUTER SCIENCE FOR STEM	3.0
In Design and Innovation		
EDNS151	CORNERSTONE - DESIGN I	3.0
Culture and Society		
HASS100	NATURE AND HUMAN VALUES	3.0
HASS215	FUTURES	3.0
EBGN321	ENGINEERING ECONOMICS	3.0
CAS Elective	Two mid-level courses from the approved list	6.0
CAS Elective	One 400-level course from the approved list	3.0
In Success and Wellness		
CSM101	FRESHMAN SUCCESS SEMINAR	1.0
CSM202	INTRODUCTION TO STUDENT WELL-BEING AT MINES	1.0
CSMXXX	One course from the approved list	1.0
In Student-Led Inquiry		
Free Electives	6 credits	6.0
Total Semester Hrs		**56.0**

Math, Basic Sciences, & Computing

Courses in this category offer a scientific and technical foundation that prepares students for advanced coursework in their disciplines.

Table 2: Cluster of Courses in Math, Basic Sciences, and Computing

MATH111	CALCULUS FOR SCIENTISTS AND ENGINEERS I	4.0
MATH112	CALCULUS FOR SCIENTISTS AND ENGINEERS II	4.0
MATH213	CALCULUS FOR SCIENTISTS AND ENGINEERS III	4.0
MATHXXX	Fourth MATH course as specified by degree	3.0
CHGN121	PRINCIPLES OF CHEMISTRY I	4.0
PHGN100	PHYSICS I - MECHANICS	4.0
CSCI128	COMPUTER SCIENCE FOR STEM	3.0
Total Semester Hrs		**26.0**

MATH XXX refers to MATH 201, MATH 225, or MATH 332. Students should check out Degree Works to verify MATH requirements for your program.

Design and Innovation

Design and Innovation immerses students in hands-on, iterative, project-based inquiry. Cornerstone Design combines engineering design, design thinking, entrepreneurial thinking, and systems analysis to pursue open-ended problem scoping, definition and articulation. Students learn fundamental STEM analysis, design tools, business acumen and professional communication skills necessary for academic and professional success.

Table 3: Course in Design and Innovation

EDNS151	CORNERSTONE - DESIGN I	3.0
Total Semester Hrs		**3.0**

Culture and Society (CAS)

Culture and Society (CAS) courses provide cultural and social perspectives to advance students' understanding of the contemporary, global world. These courses help students contextualize scientific and technical knowledge and practice to better understand their potential impacts on people, organizations, the economy and the environment. CAS courses also enhance students' abilities to communicate, explore diverse perspectives, and grapple with ethics and professional responsibilities. Ultimately, these courses provide the opportunity for students to explore what it means to be human in an interconnected world.

Table 4: Cluster of Courses in CAS

HASS100	NATURE AND HUMAN VALUES	3.0
HASS215	FUTURES	3.0
EBGN321	ENGINEERING ECONOMICS	3.0
Mid-Level CAS Electives		6.0
Senior CAS Elective		3.0
Total Semester Hrs		**18.0**

The 9 credits of mid-level and 400-level CAS electives must meet the following requirements:

- At least 3 credits must be at the 400 level.
- At least 3 credits must have a HASS course code.
- No more than 6 credits can have the LIFL (Foreign Languages) course code.
- Courses with the LIMU (Music) course code cannot be used to satisfy this requirement.
- HASS498 special topic courses can be used to satisfy this requirement.#EBGN498 andEDNS498 special topic courses will be determined to satisfy this requirement on a course-by-course basis, and that determination will be made prior to the beginning of the term the course is offered.
- Except for foreign languages, no AP or IB credit can be used to meet this requirement. (AP/IB credits will be applied as free electives.)
- Single majors in Economics cannot use courses with the EBGN course code to satisfy this requirement.

Table 5 includes the complete list of courses satisfying the CAS requirement.

Table 5: List of CAS Electives

HASSXXX	All courses with the HASS prefix are eligible for CAS credit	
LIFLXXX	All LIFL courses are eligible for CAS (midlevel) credit	
HNRSXXX	All HNRS courses are eligible for CAS credit (see your advisor)	
Economics and Business Courses approved for CAS credit		
EBGN201	PRINCIPLES OF ECONOMICS	3.0
EBGN301	INTERMEDIATE MICROECONOMICS	3.0
EBGN302	INTERMEDIATE MACROECONOMICS	3.0
EBGN310	ENVIRONMENTAL AND RESOURCE ECONOMICS	3.0
EBGN320	ECONOMICS AND TECHNOLOGY	3.0
EBGN330	ENERGY ECONOMICS	3.0
EBGN340	ENERGY AND ENVIRONMENTAL POLICY	3.0
EBGN430	ECONOMICS OF INTERNATIONAL ENERGY MARKETS	3.0
EBGN434	PROPERTY RIGHTS AND NATURAL RESOURCES	3.0
EBGN437	REGIONAL ECONOMICS	3.0
EBGN441	INTERNATIONAL ECONOMICS	3.0
EBGN443	PUBLIC ECONOMICS	3.0
EBGN470	ENVIRONMENTAL ECONOMICS	3.0
Engineering, Design, and Society courses approved for CAS credit		
EDNS220	PROBLEM FRAMING & STAKEHOLDER ENGAGEMENT	3.0

EDNS315	ENGINEERING FOR SOCIAL AND ENVIRONMENTAL RESPONSIBILITY	3.0
EDNS477	ENGINEERING AND SUSTAINABLE COMMUNITY DEVELOPMENT	3.0
EDNS478	ENGINEERING AND SOCIAL JUSTICE	3.0
EDNS479	COMMUNITY-BASED RESEARCH	3.0
Other courses approved for CAS credit		
MNGN320	MINING AND SUSTAINABILITY	
MNGN335	COMMUNITIES AND NATURAL RESOURCE DEVELOPMENT	3.0
PEGN430	ENVIRONMENTAL LAW AND SUSTAINABILITY	
SCED333	EDUCATIONAL PSYCHOLOGY AND ASSESSMENT FOR EDUCATIONAL LEADERSHIP	3.0
SCED363	DYNAMIC TEACHING: LEADING CLASSROOMS AND TEAMS THROUGH MOTIVATION, MANAGEMENT, AND DIFFERENTIATION	3.0
SCED415	SCIENTIFIC PRACTICES AND ENGINEERING DESIGN AND THE NATURE OF SCIENCE: LEADERSHIP AND INNOVATION	3.0
CSED430	COMPUTER SCIENCE PRACTICES AND TECHNOLOGICAL IMPACTS ON SOCIETY FOR LEADERSHIP AND INNOVATION	3.0
MAED405	MATHEMATICAL PRACTICES AND THE SOCIAL CONTEXT OF MATHEMATICS FOR EDUCATIONAL LEADERSHIP	3.0

Success and Wellness (S&W)

Success and Wellness (S&W) courses facilitate personal growth and encourage a balanced and healthy campus lifestyle. S&W courses are applied, experiential courses that impart foundational practical, lifelong skills or competencies to the benefit of a student's future scholastic efforts and/or personal and professional aspirations.

Table 6: Cluster of Courses in S&W

CSM101	FRESHMAN SUCCESS SEMINAR	1.0
CSM202	INTRODUCTION TO STUDENT WELL-BEING AT MINES	1.0
S&W Electives		1.0
Total Semester Hrs		**3.0**

The table below includes the complete list of courses satisfying the S&W Requirements:

Table 7: List of S&W Electives

CSM102	INTRODUCTION TO TECHNICAL WRITING	1.0
CSM250	ENGINEERING YOUR CAREER PATH	1.0
CSM275	CASA BOUNCE BACK PROGRAM	1.0
CSM350	STUDIES IN LEADERSHIP	3.0
CSM301	INTRODUCTION TO PUBLIC SPEAKING & COMMUNICATION SKILLS	1.0
*PAGNXXX	Any 1.0 credit PAGNXXX	1.0

***Please see full list of PAGN courses here.**

Student-Led Inquiry

Through this category, students will have a mechanism to pursue minors and/or additional academic course work that appeals to their interests and passion. All students regardless of the major can take 6 credits of free electives. No more than 3.0 semester credits total may be applied from activity-based courses such as band, choir, studio art, physical activity, or varsity athletics. Courses in Music may not be used to fulfill the Culture and Society restricted elective requirement but may count toward free elective credit (within the 3-credit activity-course limit).

Appendix: Revised Core for 23-24 and Beyond

The Board of Trustees of the Colorado School of Mines reserves the right to change any course of study or any part of the curriculum in keeping with educational and scientific developments; nothing in this catalog or the registration of any student shall be considered as a contract between Colorado School of Mines and the student.

In accordance with the statement on Curriculum Change (above), the Colorado School of Mines is entering a process of core curriculum revision. The table below shows the effects of the revision to the core launched in 23 – 24. The core curriculum may see further revisions in future catalog years after the new core goes through an assessment cycle of measuring how well the competencies are being met, and to meet any future needs to keep the curriculum relevant. To confirm that they are progressing according to the requirements of the revised

curriculum, students should consult their CASA academic advisor and/or departmental faculty mentor on a regular basis and should carefully consult anyCatalog Addendathat may be published during this period.

Old Core and Credit Hour (CH) Changes

- PHGN100 Credit Hour change from 4.5 to 4
- HASS100 Credit Hour change from 4 to 3
- Addition of CSM202at 1 Credit Hour
- Addition of CSCI128 at 3 Credit Hours
- Free Elective minimum Credit Hours reduced from 9 to 6
- All PAGN courses Credit Hour change from .5 to 1
- CSM101Credit Hour change from .5 to 1

Table 8: New Core

MATH111	CALCULUS FOR SCIENTISTS AND ENGINEERS I	4.0
MATH112	CALCULUS FOR SCIENTISTS AND ENGINEERS II	4.0
MATH213	CALCULUS FOR SCIENTISTS AND ENGINEERS III	4.0
MATHXXX	Fourth MATH course as specified by degree	3.0
EDNS151	CORNERSTONE - DESIGN I	3.0
CHGN121	PRINCIPLES OF CHEMISTRY I	4.0
PHGN100	PHYSICS I - MECHANICS	4.0
CSCI128	COMPUTER SCIENCE FOR STEM	3.0
HASS100	NATURE AND HUMAN VALUES	3.0
HASS215	FUTURES	3.0
EBGN321	ENGINEERING ECONOMICS	3.0
CAS Electives		9.0
CSM101	FRESHMAN SUCCESS SEMINAR	1.0
CSM202	INTRODUCTION TO STUDENT WELL-BEING AT MINES	1.0
S&W Electives		1.0
Free Electives		6.0
Total Semester Hrs		**56.0**

Guidelines for Incoming Students

All students are required to complete all core requirements and are **strongly** encouraged to do so in accordance with the schedule outlined in the degree program. Failure to do so may delay a student's ability to graduate. Students are encouraged to consult Degree Works to verify requirements for their program.

All first year incoming students will be required to complete the core requirements as outlined in Table 1: List of Core Course Requirements.

Guidelines for Students on Pre-AY 23-24 Catalogs

Students following a catalog from before the 2023-2024 academic year are encouraged to consult with their academic advisors or departmental faculty mentors to discuss the option of transitioning to a newer catalog. The guidelines provided below are designed to support these conversations and help students make well-informed decisions.

Continuing Students Switching to Newer Catalog

Students who choose to switch to a newer catalog may encounter changes in credit hour (CH) requirements for courses they have already completed. For example, HASS100 was a 4 CH course but has been reduced to 3 CH starting in the 2023-2024 academic year. Similarly, PHGN100 is down from 4.5 to 4 CH .

Students who have completed courses under the older catalog requirements can apply those credits toward the revised requirements in the new catalog without retaking the courses. Any remaining coursework for graduation must be completed in accordance with the credit hour requirements specified in the new catalog.

- Students who have already completed CSCI101 at 3 CH or CSCI101 and CSCI102 for a total of 4 CH can substitute it for CSCI128 should they choose to switch catalogs.
- Students who have taken CSM101 at 0.5 CH will not need to retake the course. If students have taken three or more PAGN credits at 0.5 CH already, they are not required to take CSM202.
- Students who have completed EBGN201 and want to switch to a newer catalog will still need to complete EBGN321. EBGN201 can be considered mid-level CAS elective or a free elective.
- Students who have completed HASS200 and wish to switch to the 2025-2026 catalog year or later must complete HASS215 to meet the new core curriculum requirement. In this case, HASS200 will be counted as a free elective or a mid-level CAS elective.
- This figure summarizes how students who choose to switch catalogs can complete their core requirements without having to take additional or repeating coursework. The sections on Completing Core CS requirements, Completing CAS requirements, and Completing Core S&W Requirements outline the options in more detail.

Continuing Students Staying on Pre-AY 23-24 Catalog

For students completing degree requirements under a catalog prior to 2023-2024, the credit hours for certain courses may have been reduced. For example, HASS100 has been adjusted from 4 to 3 credit hours, and PHGN100 from 4.5 to 4 credit hours. Students should enroll in CSCI128 to fulfill the CSCI101/102 requirements for their degree.

The updated versions of these courses will still satisfy the corresponding requirements from previous catalogs. However, students may need to take additional elective credits to meet the minimum overall credit hour requirement for degree completion.

Continuing students who remain on an older catalog may need to complete one or two CH of Success and Wellness Electives to complete the PAGN requirements per the old catalog.

Guidelines for Students Bringing External Credit

Please refer to the transfer information on the registrar's website for the most current requirements.

Completing Core CS Requirements

1. If a student is on an existing catalog that requires 101 and they have taken it, then their options are:
   a. Do nothing, remain on the old catalog
   b. Change to newer catalog (AY 23-24 or after) and have CSCI101 substitute for CSCI128
2. If a student is on an existing catalog that requires 101 but they haven't taken it yet, then their options are:
   a. Remain on the old catalog and take CSCI128 in Fall 2023 or later and have CSCI128 substitute for CSCI101
   b. Change to newer catalog (AY 23-24 or after) and take CSCI128 in Fall 2023 or later
3. If a student is on an existing catalog that does not require CSCI101 and they have taken it, then their options are:
   a. Do nothing, remain on the old catalog
   b. Change to newer catalog (AY 23-24 or after) and have CSCI101 CSCI101CSCI101CSCI101CSCI101CSCI101CSCI101CSCI101CSCI101CSCI101substitute for CSCI128 CSCI128CSCI128CSCI128CSCI128CSCI128CSCI128CSCI128CSCI128CSCI128.
4. If a student is on an existing catalog that does not require CSCI101 and they have not taken it, then their options are:
   a. Do nothing, remain on the old catalog
   b. Change to newer catalog (AY 23-24 or after) and#takeCSCI128 in Fall 2023 or later

Completing CAS Requirements

1. If a student is on an existing catalog that requires EBGN201 and they have taken it, then their options are:
   a. Do nothing, remain on the old catalog (catalog prior to 23 – 24)
   b. Change to newer catalog (AY 23 – 24 or after)
      i. Complete EBGN321
      ii. Have EBGN201 count as a mid-level CAS elective or free elective
2. If a student is on an existing catalog that requires HASS200 and they have taken it, then their options are:
   a. Do nothing, remain on the old catalog (catalog prior to 25 – 26)
   b. Change to newer catalog (AY 25 – 26 or after)
      i. Complete HASS215
      ii. Have HASS200 count as free elective or CAS elective
3. If a student is on an existing catalog that requires HASS 200 and they have taken HASS 298 (Course Title: Futures), then their options are:
   a. Do nothing, remain on the old catalog (catalog prior to 25 – 26) and have HASS 298 substitute for HASS 200.
   b. Change to a newer catalog (AY 25 – 26 or after) and have HASS 298 substitute for HASS 215.

Completing Core S&W Requirements

1. If a student is currently on a catalog prior to 23 – 24, their options are:

a. Remain on the old catalog.

i. Complete CSM101, if not already.

ii. Complete at least 2.0 CH of (old catalog) PAGN requirement (if not met and previously earned via 4 PAGN courses) by way of CSM102(1CH), CSM250(1CH), CSM202(1CH), CSM275(1CH), CSM301(1 CH), CSM350(3CH), or PAGNXXX (1CH).

b. Change to newer catalog (AY 23-24 or after)

i. Complete CSM101, if not already.

ii. If a student has earned 0.5 CH or 1 CH of PAGN credit prior to switching to a newer catalog (AY 23 – 24 or after), then

A. Complete CSM202

B. Complete at least 1.0 CH S&W requirement by way of CSM102(1CH), CSM250(1CH), CSM275(1CH), CSM301(1 CH), CSM350(3CH), PAGNXXX (1CH).

iii. If a student has earned 1.5 CH or 2 CH of PAGN credit prior to switching to a newer catalog (AY 23 – 24 or after), then no further action needed. *NOTE: This accepts the potential of only 2 or 2.5 credits earned (because CSM101 prior to Fall 23 was 0.5 CH). This is permissible.*