

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 (p. 4) 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
HASS200	GLOBAL STUDIES	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

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
HASS200	GLOBAL STUDIES	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 and #EDNS498 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 (p. 2) 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	ADVANCED ENERGY ECONOMICS	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		
EDNS315	ENGINEERING FOR SOCIAL AND ENVIRONMENTAL RESPONSIBILITY	3.0
EDNS375	ENGINEERING CULTURES	3.0
EDNS475	ENGINEERING CULTURES IN THE DEVELOPING WORLD	3.0

EDNS477	ENGINEERING AND SUSTAINABLE COMMUNITY DEVELOPMENT	3.0
EDNS478	ENGINEERING AND SOCIAL JUSTICE	3.0
EDNS479	COMMUNITY-BASED RESEARCH	3.0
EDNS480	ANTHROPOLOGY OF DEVELOPMENT	3.0
Other courses approved for CAS credit		
MNGN335	COMMUNITIES AND NATURAL RESOURCE DEVELOPMENT	3.0
PEGN430	ENVIRONMENTAL LAW AND SUSTAINABILITY	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

CSM250	ENGINEERING YOUR CAREER PATH	1.0
CSM275	CASA BOUNCE BACK PROGRAM	1.0
CSM350	STUDIES IN LEADERSHIP	3.0
PAGN2XX	Any 1.0 credit PAGN2XX	1.0

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.

appendix: revised core for 23-24

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 for the 23 – 24 catalog. 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 any Catalog Addendum that may be published during this period.

Old Core and Credit Hour (CH) Changes

- PHGN100 Credit Hour change from 4.5 to 4
- HASS Credit Hour change from 4 to 3
- Addition of CSM202 at 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
- CSM 101 Credit 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
HASS200	GLOBAL STUDIES	3.0
EBGN321	ENGINEERING ECONOMICS	3.0
CAS Elective		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 by your 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 your program.

All first year incoming students will be required to complete the core requirements as outlined in Table 1: List of Core Course Requirements. Flexibility may be needed in when students are able to take CSCI128 and CSM202.

Guidelines for Continuing Students

Students who have already completed one or more semesters at Mines should consult with their academic advisors or departmental faculty mentors to determine if they would like to switch to the new catalog. The following set of guidelines should be able to help students have these conversations and make informed decisions.

Continuing Students Switching to New Catalog

Students choosing to switch catalog may have completed courses at an older CH requirement. Example, HASS100 used to be a 4 CH course but is 3 CH course in the 23 – 24 catalog. Similarly, PHGN100 is down from 4.5 to 4 CH. Students who have completed courses per the older catalog requirements and are switching catalogs can substitute older courses for revised courses in the new catalog. They do not need to retake these courses. Students will complete any of the remaining coursework for graduation per the revised CH 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.
- Figure 1 and Figure 2 summarize 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 and Completing Core S&W Requirements outline the options in more detail.

Continuing Students Staying on Old Catalog

For students completing degree requirements under a catalog prior to 2023-2024, the credits of some courses may have decreased. For example, HASS 100 (4 to 3 CH) and PHYS 100 (4.5 to 4 CH). The new versions of those updated courses will still fulfill the previous course requirements, but students may need to enroll in additional elective credits to meet the minimum overall Credit Hours needed to complete their degree.

Please refer to Figure 3: Expectations from students who do not switch catalogs to check how to complete CS requirements.

Continuing students who remain on the old catalog may need to complete one or two CH of Success and Wellness Electives to complete the PAGN requirements per the old catalog. Refer to Figure 4: Expectations from

students who do not switch catalogs but still need to complete their PAGN requirements.

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 catalogs to AY 23-24 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
 - i. Take CSCI101 during the Summer 2023
 - ii. OR Take CSCI128 in Fall 2023 or later and have CSCI128 substitute for CSCI101
 - b. Change catalogs to AY 23-24 and take CSCI 128 in Fall 2023 or later
3. If a student is on an existing catalog that does not require CSCI 101 and they have taken it, then their options are:
 - a. Do nothing, remain on the old catalog
 - b. Change catalogs to AY 23-24 and have CSCI101 substitute for CSCI128
4. If a student is on an existing catalog that does not require CSCI 101 and they have not taken it, then their options are:
 - a. Do nothing, remain on the old catalog
 - b. Change catalogs to AY 23-24 and
 - i. Take CSCI101 during Summer 2023 and have CSCI101 substitute for CSCI128
 - ii. OR Take CSCI 128 in Fall 2023 or later

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 CSM 101, 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 CSM 250 (1CH), CSM 202 (1CH), CSM 275 (1CH), CSM 350 (3CH), or PAGN 2XX (1CH).
 - b. Change catalogs to AY 23 – 24
 - i. Complete CSM 101, if not already.
 - ii. Complete CSM 202.
 - iii. If necessary: Complete at least 1.0 CH S&W requirement by way of CSM 250 (1CH), CSM 275 (1CH), CSM 350 (3CH), PAGN 2XX (1CH).

NOTE: This accepts the potential of only 2.5 credits earned (because CSM101 prior to Fall 23 was 0.5 CH). This is permissible.