



MECHANICAL ENGINEERING PARTNERSHIP PROGRAM

2021 – 2022

www.coloradomesa.edu/engineering

The Bachelor of Science Degree in Mechanical Engineering obtained through the Engineering Partnership Program is conferred by the University of Colorado Boulder. Lower-division coursework is completed through Colorado Mesa University before applying for admission to the University of Colorado Boulder. The entire program is completed on the campus of Colorado Mesa University. A student may apply for admission to the University of Colorado Boulder through the Engineering Partnership Program when the criteria of one of the following scenarios is satisfied:

Scenario One

- Complete the course sequence listed on the current Degree Worksheet for first and second years at Colorado Mesa University
- Maintain a combined GPA in these courses not lower than 3.0
- Maintain an overall Colorado Mesa University cumulative GPA not lower than 3.0

Scenario Two

- Complete a two-course sequence in calculus at Colorado Mesa University with a grade of “B” or higher
- Complete two physical science courses at Colorado Mesa University (calculus-based physics and/or college chemistry) with a grade of “B” or higher
- Maintain an overall GPA of 3.0 or better for all courses at Colorado Mesa University

Student Outcomes. Graduates of this program will have...

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Program Objectives

Mechanical engineering is a broad engineering discipline that incorporates skills and expertise in the areas of design, manufacturing, mechanics and thermal sciences that are essential to most sectors of industry.

Within the first three years after graduation, our alumni will have built on the educational foundation gained through our program by establishing themselves in professional careers and/or pursuing a graduate degree. In addition, within these three years, our alumni should have begun to generate new knowledge and/or exercise leadership in their positions.

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The Bachelor of Science Degree in Mechanical Engineering requires:

- [Transfer](#) to the University of Colorado Boulder of all coursework listed on the plan of study
- At least 45 credits earned from the University of Colorado Boulder ([residency requirement](#))
- A minimum of 128 credits earned to graduate
- A cumulative and major [GPA of at least 2.25](#) (from entirely CU Boulder coursework as a student's GPA does not transfer from non-CU institutions)
- Satisfactory completion of all [Minimum Academic Preparation Standards](#) (MAPS) deficiencies
- Successful completion of an outcome measurement prior to graduation (take the [FE Exam](#))

AP & IB Credit

Engineering Partnership students must achieve the [scores required of CU Boulder](#) for AP and IB credit. An AP score of 5 is required on Physics C: Mechanics to receive credit for PHYS 131 & 131L. This score is higher than the score required for credit from CMU.

MAPS (Minimum Academic Preparation Standards)

MAPS content areas are usually fulfilled by high school coursework, but sometimes students have to address "MAPS deficiencies" with their college coursework. Typically, one unit equals one year of high school study or one semester of college course work. For engineering students, those who experience a MAPS deficiency most often need to take additional foreign language courses. The good news is that these courses can do "double duty" by fulfilling MAPS as well as humanities/social sciences requirements. The MAPS requirement for foreign language is:

3 units in a single foreign language

or

2 units in each of 2 separate foreign languages

What this requirement means is that students must demonstrate written and oral language proficiency through the third-level of a single foreign language, where third-level means third full year of high school or third semester college course. Alternatively, a student must demonstrate second-level proficiency in two different foreign languages (e.g., complete 2 years of high school French + 2 semesters of college-level Spanish).

The full policy on MAPS can be found on the [CEAS Degree Requirement website](#).

Academic Calendar

The Engineering Partnership Program follows the calendar of Colorado Mesa University for semester start and end dates as well as breaks. Add, drop, and withdrawal dates may differ and can be found on the [CU Boulder Registrar's Website](#).

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COURSES

Mathematics & Basic Sciences: 34 semester hours

MATH 135	Engineering Calculus I	4
MATH 136	Engineering Calculus II	4
MATH 253	Calculus III	4
MATH 236	Differential Equations & Linear Algebra	4
PHYS 131	Fundamental Mechanics	4
PHYS 131L	Fundamental Mechanics Lab*	1
PHYS 132	Electromagnetism & Optics	4
PHYS 132L	Electromagnetism & Optics Lab*	1
CHEM 151	Engineering Chemistry	4
CHEM 151L	Engineering Chemistry Lab*	1
	Basic Science Elective*:	3
	BIOL 209 Human Anatomy and Physiology (3-cr)	
	CHEM 311 Organic Chemistry I (4-cr)	
	PHYS 230 Intermediate Dynamics (3-cr)	
	PHYS 231 Modern Physics (3-cr)	

Computer Science: 4 semester hours

CSCI 130	Introduction to Engineering Computing*	4
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Writing: 3 semester hours

ENGL 325	Writing for Engineers	3
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Machining: 1 semester hour

MAMT 102	Machining Fundamentals*	1
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* Courses with a lab component must be taken concurrently

CMU Engineering Courses: 19 semester hours

ENGR 101	Introduction to Engineering*	1
ENGR 125	CAD and Fabrication*	3
ENGR 140	1st-Year Engineering Projects*	3
ENGR 224	Materials Science*	2
ENGR 224L	Materials Science Lab*	1
ENGR 261	Statics & Structures*	3
ENGR 263	Mechanics of Solids*	3
ENGR 343	Dynamics*	3

CU Boulder Engineering Courses: 39 semester hours

MCEN 2000	Mechanical Engineering as a Profession	1
MCEN 3012	Thermodynamics	3
ECEN 3010	Circuits & Electronics	3
MCEN 3021	Fluid Mechanics	3
MCEN 3022	Heat Transfer	3
MCEN 3025	Component Design	3
MCEN 3030	Computational Methods	3
MCEN 3032	Thermodynamics 2	3
MCEN 3047	Data Analysis & Experimental Methods	4
MCEN 4026	Manufacturing Processes & Systems	3
MCEN 4043	System Dynamics	3
MCEN 4045	ME Design Project 1	3
MCEN 4085	ME Design Project 2	3
MCEN 4086	Writing for Design Projects	1

Humanities & Social Science Elect: 15 semester hours

Humanities & Social Sciences*	9
Upper-Division Humanities & Social Sciences	6

Technical Electives: 12 semester hours

Gen Tech	Upper-Division Engineering, Computer Science, Math, and Science	6
MCEN ?????	Mechanical Engineering Electives (one EMEN course may count as an MCEN technical elective)	6

Free Elective: 1 semester hour

TOTAL CREDITS 128



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Acceptable Course Substitutions

MAMT 115 Introduction to Machine Shop (3-credits) for MAMT 102 Machining Fundamentals (1-credit)

MATH 151 Calculus I (5-credits) for MATH 135 Engineering Calculus I (4-credits)

MATH 152 Calculus II (5-credits) for MATH 136 Engineering Calculus II (4-credits)

CHEM 131 General Chemistry I (4-credits) for CHEM 151 Engineering Chemistry (4-credits)

CHEM 131L General Chemistry Laboratory I (1-credit) for CHEM 151L Engineering Chemistry Laboratory (1-credit)

Humanities & Social Science Electives

See: <https://www.coloradomesa.edu/engineering/degrees/hssacceptableclasses2021082.pdf>

General Technical Electives

CMU 300- and 400-level courses in the following subjects are considered General Technical Electives: CHEM, CSCI, ENGR, MATH, and PHYS. CU Boulder 3000- and 4000-level courses in the following subjects are considered General Technical Electives: CVEN, ECEN, EMEN, and MCEN.

MCEN Technical Electives

4000-level MCEN courses not otherwise required for the major are considered MCEN Technical Electives. One EMEN 3000- or 4000-level course can apply towards an MCEN Technical Elective.

Grade Requirements

The minimum passing grade for prerequisite and co-requisite classes is a C. This includes courses completed outside the program. The minimum passing grade for standalone classes is a D-. [College of Engineering and Applied Science Academic Expectations and Policies](#) state that if a minimum required grade in a prerequisite course is not achieved, a student is required to repeat a course until the minimum acceptable grade has been earned (maximum of 3 attempts total). If a student takes the advanced (post-requisite) course, this does not remove the obligation to meet the prerequisite course minimum grade requirement, even if the grade earned in the advanced course is acceptable.

Academic Standing

To remain in good academic standing with the College of Engineering and Applied Science, a student must maintain satisfactory academic performance as measured by GPA and progress toward completion of a Bachelor of Science degree. Students must maintain both a cumulative and major CU Boulder GPA of at least 2.25 based entirely on CU Boulder coursework. Courses taken at CMU do not count toward CU Boulder GPA. Failure to meet these requirements results in a student being placed on Academic Alert, Academic Recovery, and/or Academic Suspension. Students in this situation should consult the Partnership Program Director and review the Academic Standing Policies:

<https://www.colorado.edu/engineering-advising/academic-standing>

Free Electives

College-level coursework accepted by CU Boulder not used otherwise to satisfy the requirements of this degree. Use Transferology.com to verify that courses will transfer to CU Boulder.

Fundamentals of Engineering (FE) Exam

Students in the Engineering Partnership Program must take the [Fundamentals of Engineering \(FE\) Examination](#) before graduation. Graduation is not contingent upon passing; however, it is beneficial to do so because this exam is the first step toward licensure as a professional engineer.



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Coursework Not Accepted for Transfer Credit

All CMU coursework will undergo a transfer evaluation and the credit be transferred to CU Boulder (along with any other university coursework). The following coursework will not be accepted for transfer credit and will not count toward a degree at CU Boulder, as described in the [Campus Transfer Credit Policy](#):

- courses completed more than 10 years prior to transfer
- any courses in which the grade earned is below a C- (1.70)
- courses identified by CU Boulder as remedial, such as remedial English, mathematics, science and developmental reading
- vocational-technical courses that are offered at two-year and proprietary institutions (exceptions may be granted only by the CU Boulder dean responsible for the student's curriculum—when exceptions appear to be warranted, appropriate department heads make recommendations to their respective deans regarding credit for such courses)
- courses in religion that constitute specialized religious training or that are doctrinal in nature
- credits earned for work experience or through a cooperative education program
- outdoor leadership education coursework
- credits earned in physical education activity courses
- courses or programs identified as college orientation

Students are responsible for making up any difference in credit hours between the transfer credit received and the CU Boulder course (to meet the 128 required credits to graduate), per [CEAS Transfer Credit Policy](#).