

PHYSICS, LIBERAL ARTS (AS)

Degree: Associate of Science
Major: Liberal Arts
Emphasis: Physics
Program Code: 2433

About This Major . . .

The Associate of Science (AS) degree is designed for students who intend to continue their education and obtain a baccalaureate degree. The AS is the appropriate choice for students who will take upper division coursework in mathematics, biological sciences, and physical sciences. The degree program includes the Colorado Statewide Essential Learning Core and meets the lower division Essential Learning requirements at most public institutions in Colorado. A number of emphases are available within the AS degree. Students choosing one of these emphases will take courses in a discipline in addition to the Essential Learning core.

Physics is the study of the universe: what it's made of and how it works, ranging from stars and galaxies to atoms and nuclei and everything in between. Physics forms the foundation of many technical fields including electronics and optics. Physics also features prominently in many of the hottest areas of current research and innovation, such as the multidisciplinary fields of nanotechnology and biophysics. Our goal is to provide students with the critical and analytical thinking skills needed to solve problems. This skill set prepares students for further study and for jobs in engineering, business, and research.

For more information on what you can do with this major, visit Career Services' [What to Do with a Major?](#) resource.

All CMU/CMU Tech associate graduates are expected to demonstrate proficiency in specialized knowledge/applied learning, quantitative fluency, communication fluency, critical thinking, personal and social responsibility, and information literacy. In addition to these campus-wide student learning outcomes, graduates of this major will be able to:

- a. Show fluency with aspects of the major fields of physics typical for introductory and sophomore level physics courses. (Specialized Knowledge)
- b. Use mathematical representation to analyze physical scenarios. (Quantitative Fluency)
- c. Use laboratory techniques to analyze physical scenarios. (Critical Thinking)

Requirements

Each section below contains details about the requirements for this program. Select a header to expand the information/requirements for that particular section of the program's requirements.

To print or save an overview of this program's information, including the program description, learning outcomes, requirements, suggested course sequencing (if applicable), and advising and graduation information, scroll to the bottom of the left-hand navigation menu and select "Print Options." This will give you the options to either "Send Page to Printer" or "Download PDF of This Page." The "Download PDF of This Page" option prepares a much more concise presentation of all program information. The PDF is also printable and may be preferable due to its brevity.

Institutional Degree Requirements

The following institutional degree requirements apply to all CMU or CMU Tech Associate of Science (AS) degrees. Specific programs may have different requirements that must be met in addition to institutional requirements.

- 60 semester hours total.
- Students must complete a minimum of 15 of the final 30 semester hours of credit at CMU/CMU Tech.
- 2.00 cumulative GPA or higher in all CMU/CMU Tech coursework.
- A grade of "C" or higher must be earned in all Essential Learning courses in order to be accepted for transfer under the Colorado Core Transfer Consortium General Education curriculum or gtPathways, Colorado's guaranteed transfer program.
- A course may only be used to fulfill one requirement for each degree/certificate.
- No more than six semester hours of independent study courses can be used toward the degree.
- Non-traditional credit, such as advanced placement, credit by examination, credit for prior learning, cooperative education and internships, cannot exceed 15 semester credit hours for an associate of science degree. A maximum of 6 of the 15 credits may be for cooperative education, internships, and practica.
- Pre-collegiate courses (usually numbered below 100) cannot be used for graduation.
- Capstone exit assessment/projects (e.g., Major Field Achievement Test) requirements are identified under Program-Specific Degree Requirements.
- The Catalog Year determines which program sheet and degree requirements a student must fulfill in order to graduate. Visit with your advisor or academic department to determine which catalog year and program requirements you should follow.
- See "Requirements for Undergraduate Degrees and Certificates" in the catalog for a complete list of graduation requirements.

Essential Learning Requirements

(31 semester hours)

See the current catalog for a list of courses that fulfill the requirements below. If a course is an Essential Learning option and a requirement for your major, you must use it to fulfill the major requirement and make a different selection for the Essential Learning requirement.

Code	Title	Semester Credit Hours
English ¹		
ENGL 111	English Composition I-GTC01	3
ENGL 112	English Composition II-GTC02	3
Mathematics ¹		
MATH 151	Calculus I-GT-MA1 ²	3
History		
Select one History course		3
Humanities		
Select one Humanities course		3
Social and Behavioral Sciences		
Select one Social and Behavioral Sciences course		3

Select one Social and Behavioral Sciences course	3
Fine Arts	
Select one Fine Arts course	3
Natural Sciences	
Select one Natural Sciences course	3
Select one Natural Sciences course with a lab	4
Total Semester Credit Hours	31

- ¹ Must receive a grade of "C" or better and must be complete by the time the student has 60 semester hours.
- ² This is a 5 credit course. 3 credits apply to the Essential Learning requirements and 2 credits apply to Physics Specialization courses

Other Lower Division Requirements

Code	Title	Semester Credit Hours
Wellness Requirement		
KINE 100	Health and Wellness	1
Select one Activity course		1
Total Semester Credit Hours		2

Program Specific Degree Requirements

(24 Semester Hours. No more than one "D" may be used in satisfying major requirements. Additionally, a cumulative grade point average of 2.5 or higher must be maintained for coursework in this area.)

Code	Title	Semester Credit Hours
Core Courses		
PHYS 131	Fundamental Mechanics-GTSC1	4
PHYS 131L	Fundamental Mechanics Laboratory-GTSC1	1
PHYS 132	Electromagnetism and Optics-GTSC1	4
PHYS 132L	Electromagnetism and Optics Laboratory-GTSC1	1
PHYS 230	Intermediate Dynamics	3
or PHYS 231	Modern Physics	
Physics Specialization Courses		
MATH 151	Calculus I-GT-MA1	2
MATH 152	Calculus II	5
MATH 253	Calculus III	4
Total Semester Credit Hours		24

General Electives

(3 semester hours)

Code	Title	Semester Credit Hours
Select elective(s)		3
Total Semester Credit Hours		3

Suggested Course Plan

First Year		Semester Credit Hours
Fall Semester		
PHYS 131	Fundamental Mechanics-GTSC1	4
PHYS 131L	Fundamental Mechanics Laboratory-GTSC1	1
ENGL 111	English Composition I-GTCO1	3
MATH 151	Calculus I-GT-MA1	5
Essential Learning - History		3
Semester Credit Hours		16
Spring Semester		
PHYS 132	Electromagnetism and Optics-GTSC1	4
PHYS 132L	Electromagnetism and Optics Laboratory-GTSC1	1
ENGL 112	English Composition II-GTCO2	3
MATH 152	Calculus II	5
General Elective		3
Semester Credit Hours		16
Second Year		
Fall Semester		
MATH 253	Calculus III	4
Essential Learning - Natural Science with lab		4
Essential Learning - Social and Behavioral Sciences		3
Essential Learning - Humanities		3
Semester Credit Hours		14
Spring Semester		
PHYS 230	Intermediate Dynamics ¹	3
Essential Learning - Fine Arts		3
Essential Learning - Natural Science without lab		3
Essential Learning - Social and Behavioral Sciences		3
KINE 100	Health and Wellness	1
Wellness Requirement - Activities Course		1
Semester Credit Hours		14
Total Semester Credit Hours		60

¹ Students that intend to continue with Colorado Mesa University should take ESSL 290 and ESSL 200 during the final semester of their Associate of Science work.

Advising and Graduation

Advising Process and DegreeWorks

Documentation on the pages related to this program is intended for informational purposes to help determine what courses and associated requirements are needed to earn a degree. The suggested course sequencing outlines how students could finish degree requirements. Some courses are critical to complete in specific semesters, while others may be moved around. Meeting with an academic advisor is essential in planning courses and altering the suggested course sequencing. It is ultimately the student's responsibility to understand and fulfill the requirements for their intended degree(s).

DegreeWorks is an online degree audit tool available in MAVzone. It is the official record used by the Registrar's Office to evaluate progress towards a degree and determine eligibility for graduation. Students are responsible for reviewing their DegreeWorks audit on a regular basis and should discuss questions or concerns with their advisor or academic department head. Discrepancies in requirements should be reported to the Registrar's Office.

Graduation Process

Students must complete the following in the first two months of the semester prior to completing their degree requirements:

- Review their DegreeWorks audit and create a plan that outlines how unmet requirements will be met in the final semester.
- Meet with their advisor and modify their plan as needed. The advisor must approve the final plan.
- Submit the “Intent to Graduate” form to the Registrar’s Office to officially declare the intended graduation date and commencement ceremony plans.
- Register for all needed courses and complete all requirements for each degree sought.

Submission deadlines and commencement details can be found on the [Graduation](#) web page.

If a student’s petition for graduation is denied, it will be their responsibility to apply for graduation in a subsequent semester. A student’s “Intent to Graduate” does not automatically move to a later graduation date.