

LAND SURVEYING AND GEOMATICS (AAS)

Degree: Associate of Applied Science
 Program of Study: Land Surveying and Geomatics
 Program Code: 1334

The Land Surveying and Geomatics program prepares students to use surveying equipment that is an integral part of land development for areas of engineering, construction projects and planning. Students learn to use surveying equipment to measure elevations, and positions on or below the surface of the earth. They also learn to use technology to process the measured data. Students also learn the mathematical and technical calculation fundamentals associated with their measurements, and the fundamental boundary law principles as they apply to boundary surveys and boundary determinations.

The AAS in Land Surveying and Geomatics degree meets the Colorado education requirements to be eligible to take the Fundamentals of Surveying examination for Land Surveyor Intern in the state of Colorado under C.R.S. 12-25-212 (3) (a) (II) (A) "Have graduated from a board-approved two-year surveying curriculum", provided they have the requisite progressive land surveying experience listed under part (II)(B) "Have a cumulative record of two years or more of progressive land surveying experience".

The AAS in Land Surveying and Geomatics degree also meets the Colorado education requirements to be eligible to take the Professional Land Surveyor's examination for licensure as a Professional Land Surveyor in the state of Colorado under C.R.S. 12-25-214 (2)(a) and (b)(III)(A) "Have graduated from a board-approved two-year surveying curriculum or a four year engineering curriculum that included surveying course work as specified by the board by rule", provided they have the requisite progressive land surveying experience under (III)(B) "Have six years of progressive land surveying experience of which four years shall have been under the supervision of a professional land surveyor or an exempt federal employee as defined under 12-25-203 (1)(b); and (III)(C) "Have been enrolled as a land surveyor-intern in this state">

For more information on what you can do with this major, visit CMU Tech's [Programs of Study](#) page.

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:

1. Demonstrate the theoretical knowledge used in the performance of land surveying and geomatics professions. (Specialized Knowledge)
2. Demonstrate the practical skills and use of surveying tools according to the Land Surveying and Geomatics curriculum. (Applied Learning)
3. Demonstrate the practical skills and use of other surveying, drafting, and GIS tools according to the Land Surveying and Geomatics curriculum. (Applied Learning)
4. Demonstrate and apply higher level mathematical concepts that are necessary to complete complex survey tasks. (Quantitative Fluency)
5. Describe and understand the Common Law roots of Boundary Law and their importance in maintaining and generating accurate land

transaction records and be able to apply those principles in land surveying. (Communication Fluency)

6. Analyze surveying problems and issues to determine the proper approach to the correct solution, including proper measuring and calculation techniques and the common law legal principles to apply to arrive at the proper results and interpretation of these surveying problems. (Critical Thinking, Information Literacy)
7. Describe the ethical, as well as the practical role of surveying, including the applicable federal, state and local laws. (Personal and Social Responsibility)
8. Demonstrate an ability to meet the expected norms of the workforce. (Personal and Social Responsibility)

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 and CMU Tech Associate of Applied Science (AAS) degrees. Specific programs may have different requirements that must be met in addition to institutional requirements.

- 60 semester hours minimum.
- 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 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 20 semester credit hours for an AAS degree.
- 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.

Specific to this degree:

- 61 credit hours total required for the AAS in Land Surveying and Geomatics.

Essential Learning Requirements

(17 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
Communication		
ENGL 111	English Composition I-GTCO1	3
Select one of the following: 3		
ENGL 112	English Composition II-GTCO2	
SPCH 101	Interpersonal Communication	
SPCH 102	Speechmaking	
Mathematics		
MATH 114	Trigonometry and Analytic Geometry ¹	3
	or MATH 130 Trigonometry	
Other Essential Learning Core Courses		
PHYS 111	General Physics I-GTSC1	4
PHYS 111L	General Physics I Laboratory-GTSC1	1
Select one Social and Behavioral Sciences, Natural Sciences, Fine Arts or Humanities course 3		
Total Semester Credit Hours		17

¹ A course higher than MATH 114 or MATH 130 may be taken instead, but the student should meet with an advisor to ensure the overall minimum number of math credits is met as required by the Architects, Engineers, and Surveyors Board (AES Board).

Other Lower Division Requirements

Code	Title	Semester Credit Hours
Wellness Requirement		
KINE 100	Health and Wellness	1
KINA 1XX	Activity Course	1
Total Semester Credit Hours		2

Program Specific Degree Requirements

(42 semester hours, must complete with a grade of "C" or higher.)

Code	Title	Semester Credit Hours
CADT 106	Computer Aided Design	3
CADT 130	CAD-Civil	3
GEOG 131	Introduction to Cartography	3

GIST 332 & 332L	Introduction to Geographic Information Systems and Introduction to Geographic Information Systems Laboratory	3
Complete one of the following:		3-5
MATH 121	Calculus for Business	
MATH 141	Analytical Geometry	
MATH 131	Applied Calculus-GTMA1	
MATH 135	Engineering Calculus I	
MATH 151	Calculus I-GTMA1	
STAT 200	Probability and Statistics-GTMA1	3
SURV 100	Introduction to Surveying/Field Work	3
SURV 102	Surveying Calculations I	4
SURV 200	Advanced Surveying Field Work	3
SURV 203	Legal Aspects of Surveying	3
SURV 204	Real Property Descriptions	2
SURV 205	Advanced Surveying Computations/Calculations	4
SURV 206	Property Law - Boundary Evidence	3
SURV 207	Surveying Ethics: An Overview of Ethical Expectations	2

Total Semester Credit Hours 42-44**Suggested Course Plan**

First Year		Semester Credit Hours
Fall Semester		
ENGL 111	English Composition I-GTCO1	3
GEOG 131	Introduction to Cartography	3
MATH 130	Trigonometry	3
SURV 100	Introduction to Surveying/Field Work	3
SURV 102	Surveying Calculations I	4
Semester Credit Hours		16
Spring Semester		
Complete one of the following:		3
ENGL 112	English Composition II-GTCO2	
SPCH 101	Interpersonal Communication	
SPCH 102	Speechmaking	
Complete one of the following:		3-5
MATH 141	Analytical Geometry	
MATH 121	Calculus for Business	
MATH 131	Applied Calculus-GTMA1	
MATH 135	Engineering Calculus I	
MATH 151	Calculus I-GTMA1	
CADT 106	Computer Aided Design	3
STAT 200	Probability and Statistics-GTMA1	3
SURV 203	Legal Aspects of Surveying	3
SURV 204	Real Property Descriptions	2
Semester Credit Hours		17-19
Second Year		
Fall Semester		
CADT 130	CAD-Civil	3
PHYS 111 & 111L	General Physics I-GTSC1 and General Physics I Laboratory-GTSC1	5
SURV 206	Property Law - Boundary Evidence	3
SURV 207	Surveying Ethics: An Overview of Ethical Expectations	2
Select one KINA Activity course		1
Semester Credit Hours		14

Spring Semester

GIST 332 & 332L	Introduction to Geographic Information Systems and Introduction to Geographic Information Systems Laboratory	3
SURV 200	Advanced Surveying Field Work	3
SURV 205	Advanced Surveying Computations/Calculations	4
KINE 100	Health and Wellness	1
Essential Learning - Social and Behavioral Sciences, Natural Sciences, Fine Arts or Humanities course		3
Semester Credit Hours		14
Total Semester Credit Hours		61-63

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.