

# LAND SURVEYING AND GEOMATICS (TECHNICAL CERTIFICATE)

Award: Technical Certificate

Program of Study: Land Surveying and Geomatics

Program Code: 1122

## About This Program . . .

CMU Tech/CMU has established a post-baccalaureate certificate in an online format that allows individuals across Colorado – and in surrounding states – to complete 37 hours of surveying and math-specific course work and a combined internship/capstone project.

Colorado state law has established certain educational requirements for licensure as a Professional Land Surveyor. The Colorado Architects, Professional Engineers, and Professional Land Surveyors Board (AES Board) has then established more detailed educational requirements to meet the state law. This certificate would allow students who have an engineering degree of four or more years that needs the supplemental education in surveying and math-specific course work as established by the AES Board to meet the education requirements for eligibility to take the Colorado required exams for the Professional Land Surveyor's License.

For those students with a non-surveying curriculum or non-engineering curriculum of four or more years, additional courses in technological and/or business disciplines, basic science disciplines, and additional math disciplines may be required above this certificate in order to meet the educational requirements for eligibility to take the Colorado required exams to attain a Professional Land Surveyor's License. For those with a bachelor's degree in a non-surveying or non-engineering field, contact the Program Director of the Land Surveying and Geomatics Program for an opinion on whether the Post Baccalaureate Certificate will meet the AES Board defined education requirements when combined with their bachelor's degree. For some, the Associates of Applied Science in Land Surveying and Geomatics may be the more appropriate route to meet that requirement.

As an Admissions requirement for this Post Baccalaureate Certificate Program, students must provide evidence of an earned bachelor's degree in any field from an accredited bachelor's granting program to the Program Director before acceptance into the program can occur.

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

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

- Demonstrate the theoretical knowledge used in the performance of land surveying and geomatics professions. (Specialized Knowledge)
- Demonstrate the practical skills and use of surveying tools according to the Land Surveying and Geomatics curriculum. (Applied Learning)
- Demonstrate and apply higher level mathematical concepts that are necessary to complete complex survey tasks. (Quantitative Fluency)

- Describe 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)
- 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)
- Describe the ethical, as well as the practical role of surveying, including the applicable federal, state and local laws. (Personal and Social Responsibility)
- 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 Certificate Requirements

The following institutional requirements apply to all CMU or CMU Tech Technical Certificates. Specific programs may have different requirements that must be met in addition to institutional requirements.

- Consists of 5-59 semester hours.
- Consists of 100-200 level courses.
- At least fifty percent of the credit hours must be taken at CMU/CMU Tech.
- 2.00 cumulative GPA or higher in all CMU/CMU Tech coursework.
- A grade lower than "C" will not be counted toward meeting the requirements.
- A course may only be used to fulfill one requirement for each degree/certificate.
- Non-traditional credit, such as advanced placement, credit by examination, credit for prior learning, cooperative education and internships, cannot exceed twenty-five percent of the semester credit hours required for a technical certificate.
- 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 Certificate Requirements.
- The Catalog Year determines which program sheet and certificate 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.

**Program Specific Requirements:**

As an Admissions requirement for this Post Baccalaureate Certificate Program, students must provide evidence of an earned bachelor's degree in any field from an accredited bachelor's granting program to the Program Director before acceptance into the program can occur.

For those with a bachelor's degree in a non-surveying or non-engineering field, contact the Program Director of the Land Surveying and Geomatics Program for an opinion on whether the Post Baccalaureate Certificate will meet the Colorado State Board of Architects, Professional Engineers, and Professional Land Surveyors education requirements when combined with their bachelor's degree. For some, the Associates of Applied Science in Land Surveying and Geomatics may be the more appropriate route to meet that requirement instead of this certificate.

## Program Specific Certificate Requirements

(37-39 semester hours, must earn a grade of "C" or better in each course.)

Code	Title	Semester Credit Hours
STAT 200	Probability and Statistics-GTMA1	3
MATH 130	Trigonometry	3
Complete one of the following courses:		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	
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
SURV 298	Internship/Capstone Project	4
<b>Total Semester Credit Hours</b>		<b>37-39</b>

## Suggested Course Plan

For Post Baccalaureate Certificate students working full time:

First Year		Semester Credit Hours
Fall Semester		
MATH 130	Trigonometry	3
SURV 203	Legal Aspects of Surveying	3
SURV 204	Real Property Descriptions	2
<b>Semester Credit Hours</b>		<b>8</b>
Spring Semester		
SURV 100	Introduction to Surveying/Field Work	3
SURV 102	Surveying Calculations I	4
<b>Semester Credit Hours</b>		<b>7</b>

Summer Semester		
SURV 207	Surveying Ethics: An Overview of Ethical Expectations	2
<b>Semester Credit Hours</b>		<b>2</b>

Second Year		
Fall Semester		
STAT 200	Probability and Statistics-GTMA1	3
SURV 200	Advanced Surveying Field Work	3
SURV 205	Advanced Surveying Computations/Calculations	4
<b>Semester Credit Hours</b>		<b>10</b>

Spring Semester		
Complete one of the following courses:		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	
SURV 206	Property Law - Boundary Evidence	3
<b>Semester Credit Hours</b>		<b>6-8</b>

Summer Semester		
SURV 298	Internship/Capstone Project	4
<b>Semester Credit Hours</b>		<b>4</b>
<b>Total Semester Credit Hours</b>		<b>37-39</b>

For Post Baccalaureate Certificate students attempting to maximize courses and minimize time (full time students). Note: A Spring Semester start is suggested to better fit pre-requisites and co-requisites.

First Year		Semester Credit Hours
Spring Semester		
SURV 100	Introduction to Surveying/Field Work	3
SURV 102	Surveying Calculations I	4
SURV 206	Property Law - Boundary Evidence	3
MATH 130	Trigonometry	3
STAT 200	Probability and Statistics-GTMA1	3
<b>Semester Credit Hours</b>		<b>16</b>
Summer Semester		
SURV 207	Surveying Ethics: An Overview of Ethical Expectations	2
<b>Semester Credit Hours</b>		<b>2</b>
Fall Semester		
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
Complete one of the following courses:		3-5
MATH 141	Analytical Geometry	
MATH 121	Calculus for Business	
MATH 135	Engineering Calculus I	
MATH 151	Calculus I-GTMA1	
MATH 131	Applied Calculus-GTMA1	
<b>Semester Credit Hours</b>		<b>15-17</b>

Second Year		
Spring Semester		
SURV 298	Internship/Capstone Project	4
<b>Semester Credit Hours</b>		<b>4</b>
<b>Total Semester Credit Hours</b>		<b>37-39</b>

## 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 certificate. 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 discussing the suggested course sequencing. It is ultimately the student's responsibility to understand and fulfill the requirements for their intended certificate.

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 certificate 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 certificate requirements (for one-semester certificates, complete in the first week of class):

- 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.