

# SURVEY TECHNICIAN

## CERTIFICATE - 30 CREDITS

### About this program

This certificate program provides the student with a basic study of civil engineering surveying including survey equipment setup and training, surveying principles and an introduction to civil engineering survey practices and uses. The Survey Technician program includes knowledge and training in property and land surveys, construction project design, field training in level surveys, total station and global positioning equipment, and road design and construction principles.

### Program outcomes

1. Prepare civil construction drawings utilizing CADD software.
2. Select appropriate survey techniques.
3. Demonstrate computer utilization skills.
4. Produce construction, legal and topographical surveys.
5. Utilize effective communication skills.
6. Document processes and procedures during on-site inspections.
7. Demonstrate design criteria for road design.

### Curriculum overview

Crds	Requirement type
30	Required courses
30	<b>Total</b>

**Developmental courses note:** A student may be required to enroll in developmental courses in reading, writing and math. A student's scores on the Accuplacer assessment will determine enrollment in developmental courses. The purpose of developmental courses is to prepare students for the demands of a college-level curriculum. *Credits may vary.*

**Accreditation:** Minnesota State Community and Technical College is accredited by the Higher Learning Commission, a regional accreditation agency recognized by the U.S. Department of Education. More information can be found at [www.minnesota.edu/accreditation](http://www.minnesota.edu/accreditation).

# Curriculum requirement details

## Required courses

Course	Crds
CADD1000 - AutoCAD Basics .....	3
CIVL1100 - Survey I: Fundamentals of Surveying .....	3
CIVL1119 - Survey II: Land Surveys .....	3
CIVL1138 - CADD II: Plan Layout .....	3
CIVL2209 - Construction Inspection .....	3
CIVL2210 - Road Design .....	3
ENGL1101 - College Writing .....	3
ENGT1118 - Construction and Manufacturing Math .....	3
ENGT1126 - Engineering Graphics .....	3
ENGT1134 - Office Systems and Equipment .....	3

## Other requirements or restricted electives

## Course summaries

### **CADD1000 - AutoCAD Basics** ..... (3 credits)

This course provides the fundamentals of computer-aided drafting (CAD) using the latest version of the AutoCAD drafting software. The course develops the CAD skills necessary to design and print complex two-dimensional drawings and sheet sets.

### **CIVL1100 - Survey I: Fundamentals of Surveying** ..... (3 credits)

The student will learn the principles of vertical distance measurement, as well as construction staking and the compiling of field notes typical of the civil engineering field. This course will focus on the use of various surveying equipment and procedures including an introduction to global positioning system (GPS) concepts and methods.

### **CIVL1119 - Survey II: Land Surveys** ..... (3 credits)

Students will learn civil engineering technology land surveying principles including topographic surveys, utilities, drainage and roadway alignment. This course emphasizes the use of Total Station and Global Positioning Systems (GPS) for collecting data as well as civil engineering software for processing data. Additionally, students will utilize GPS functionality on the Trimble TSC3 data collector and Trimble Business Center software.

#### **Prerequisites:**

- CIVL1100

### **CIVL1138 - CADD II: Plan Layout** ..... (3 credits)

This course introduces students to industry-specific civil design software. Students will learn concepts relating to civil engineering drawings including topography, site planning, mapping and downloading survey data to create digital terrain models.

#### **Prerequisites:**

- CADD1102

OR

- CADD1000

### **CIVL2209 - Construction Inspection** ..... (3 credits)

This course involves the study and performance of procedures necessary in the inspection and documentation of general construction of public works projects. Topics include inspector responsibilities, project management and aggregate base, concrete and bituminous inspection.

#### **Prerequisites:**

- CIVL1100

OR

- CIVL1102

### **CIVL2210 - Road Design** ..... (3 credits)

The student will complete drawings and computations typical of those used in the design of roadways. These may include control line location maps, topographic drawings, cross sections, plan and profile earthwork computations.

#### **Prerequisites:**

- CIVL1119
- CIVL1138

### **ENGL1101 - College Writing** ..... (3 credits)

Meets MnTC Goal Area 1. This is an introductory writing course designed to prepare students for later college and career writing. The course focuses on developing fluency through a process approach, with particular emphasis on revision. Students will consider purpose and audience, read and discuss writing and further develop their own writing processes through successive revisions to produce polished drafts. Course work will include an introduction to argumentative writing, writing from academic sources and a short research project.

#### **Prerequisites:**

- Completion of ELL1080, ENGL0096, or ENGL0097 with a grade of C or higher OR placement into college-level English.

**ENGT1118 - Construction and Manufacturing Math** ..... (3 credits)  
This course covers the application of common geometric and trigonometric calculations related to the construction and manufacturing industries.

**Prerequisites:**

- MATH0055

**ENGT1126 - Engineering Graphics** ..... (3 credits)  
This course introduces and develops basic skills in drawing, lettering, orthographic projection, sections and dimensioning. Students in this course will apply the basic fundamentals of pictorial drawing, including isometric, oblique, perspective, shade and shadow, and freehand sketching.

**ENGT1134 - Office Systems and Equipment** ..... (3 credits)  
This course covers the application of Windows software systems in coordination with AutoCAD software as well as general office equipment set-up and use.



# SURVEY TECHNICIAN

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Program Plan — "Survey Technician"  
Locations: Detroit Lakes

### 1st Fall Term (15 credits)

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#### Courses

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CADD1000 - AutoCAD Basics .....	3
CIVL1100 - Survey I: Fundamentals of Surveying .....	3
ENGT1118 - Construction and Manufacturing Math .....	3
ENGT1126 - Engineering Graphics .....	3
ENGT1134 - Office Systems and Equipment .....	3

### 1st Spring Term (15 credits)

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#### Courses

Course	Crds
CIVL1119 - Survey II: Land Surveys .....	3
CIVL1138 - CADD II: Plan Layout .....	3
CIVL2209 - Construction Inspection .....	3
CIVL2210 - Road Design .....	3
ENGL1101 - College Writing .....	3