

SURVEY TECHNICIAN

CERTIFICATE – 23 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. The program is scheduled for relocation to the Fergus Falls campus effective fall semester 2025.

Program outcomes

1. Prepare civil, construction and survey drawings utilizing CADD software.
2. Select and implement appropriate survey techniques and procedures.
3. Demonstrate computer utilization skills for design and graphical communication.
4. Produce construction site, legal and topographical surveys.
5. Effectively utilize graphical communication skills using diverse forms of 2D and 3D modeling software.
6. Document processes and procedures for site and building layout designs.
7. Understand and properly utilize basic hardware (input, output and storage) components and software (operating and application) used in the Windows and internet environment for effective business communications.
8. Read and interpret land survey and construction site plans, and make calculations and appropriate numerical revisions to site or building working drawings and blueprints.

Curriculum overview

Crds	Requirement type
23	Required courses
23	Total

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. The Higher Learning Commission 230 South LaSalle Street, Suite 7-500 Chicago, IL 60604-1411 <http://www.ncahigherlearningcommission.org> Phone: 312.263.0456 / 800.621.7440

Curriculum requirement details

Required courses

Course	Crds
BUS1100 - Business Computers	3
CADD1000 - AutoCAD Basics	3
CIVL1100 - Survey I: Fundamentals of Surveying	3
CIVL1119 - Survey II: Land Surveys	3
CIVL1138 - CADD II: Plan Layout	3
CONM1102 - Site/Building Layout	2
ENGT1118 - Construction and Manufacturing Math	3
ENGT1126 - Engineering Graphics	3

Other requirements or restricted electives

Course summaries

BUS1100 - Business Computers (3 credits)

Students will utilize business computer software applications including word processing, spreadsheets, databases and presentation software to solve business problems, emphasizing professional design and organization. Additional topics include basic computer hardware, computer security and ethics, privacy concerns and professional communication standards.

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

CONM1102 - Site/Building Layout (2 credits)

This course provides the student with the basic knowledge and hands-on skills necessary to lay out a building site and establish elevations for construction.

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.

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Program Plan — "Survey Technician"

Locations: Fergus Falls

1st Fall Term (17 credits)

Courses

Course	Crvs
BUS1100 - Business Computers	3
CADD1000 - AutoCAD Basics	3
CIVL1100 - Survey I: Fundamentals of Surveying	3
CONM1102 - Site/Building Layout	2
ENGT1118 - Construction and Manufacturing Math	3
ENGT1126 - Engineering Graphics	3

1st Spring Term (6 credits)

Courses

Course	Crvs
CIVL1119 - Survey II: Land Surveys	3
CIVL1138 - CADD II: Plan Layout	3