

CIVIL TECHNICIAN

DIPLOMA - 32 CREDITS

About this program

The Civil Technician program equips students with real-world experience in land surveying and as engineering technicians. Students learn the fundamentals of surveying on state-of-the-art equipment that prepares them for a career as a survey technician. Additionally, students learn the fundamentals of working as an engineering technician, and they learn to incorporate data gathered through surveys into civil engineering-related software. The program prepares students for the diverse applications used in civil engineering and land surveying in the modern workforce.

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
32	Required courses
32	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
BLDG1114 - Blueprint Reading I	2
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
CONM2204 - Materials Testing	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

BLDG1114 - Blueprint Reading I (2 credits)

This course provides the student with a working knowledge of blueprints and specifications. The student gains an understanding of blueprints, then interprets and applies this knowledge to job situations.

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

CONM2204 - Materials Testing (3 credits)

This course covers inspection techniques, methods of material measurement, documentation, material sampling and testing methods for soils and concrete.

ENGL1101 - College Writing (3 credits)

Meets MnTC Goal Area 1. This is an introductory course designed to prepare students for later college and career writing through a process approach with particular emphasis on revision. Students consider purpose and audience as they read, discuss and refine their work to develop confidence in their writing and communication skills.

Prerequisites:

- ELL1085
- ENGL0097
- or placement in 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.



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Program Plan — "Survey Technician"

Locations: Wadena

1st Fall Term (17 credits)

Courses

Course	Crds
BLDG1114 - Blueprint Reading I	2
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)

Courses

Course	Crds
CIVL1119 - Survey II: Land Surveys	3
CIVL1138 - CADD II: Plan Layout	3
CIVL2209 - Construction Inspection	3
CONM2204 - Materials Testing	3
ENGL1101 - College Writing	3