

Civil Engineering Technology

Program Code 106071

Associate Degree - Two Years Plus One Summer

Offered at the Green Bay campus. For information: (920) 498-5444.

Toll-free: (800) 422-NWTC, ext. 5444.

Program Description

Graduates of the Civil Engineering Technology program typically find employment in the Engineering or Surveying field. Careers include positions in Computer Aided Drafting and Design (CADD), construction administration and inspection, or surveying.

Program Outcomes

- Students will utilize CAD and sketching techniques to produce engineering documents.
- Students will be capable of performing design and routine testing procedures related to construction materials. These materials include soils, Portland cement concrete and hot mix asphalt.
- Students will be capable of understanding the legal aspects of land surveying and use land surveying instruments to collect data necessary to produce topographic maps, establish horizontal and vertical control, and to lay out civil engineering projects.
- Students will determine forces and stresses in elementary structural systems.
- Students will estimate material quantities for construction projects.
- Students will understand operating systems, spreadsheets, word processing, CAD, and other software products to solve technical problems.
- Students will be able to apply elements of design to materials mixtures, roads, subdivision layout, and storm and sanitary sewer systems.
- Students will be able to solve engineering, surveying, and materials testing problems using principles of mathematics, science, engineering and technology.
- Students will be able to conduct, analyze, interpret, and apply results of experiments related to science and civil engineering materials.
- Students will have the ability to function effectively on teams.
- Students will develop problem solving capabilities.
- Students will be able to communicate effectively by producing written and oral reports.
- Students will recognize the need to continue professional development by engaging in life long learning.
- Students will acquire an understanding of professional, ethical and social responsibilities.
- Students will have a respect for race, ethnic and diversity issues.
- Students will have a commitment to quality, timeliness and continuous improvement.

Employment Potential

A graduate of the program will have the potential for employment in the following areas:

Civil Construction Inspector: examines and interprets prints and specifications; confers with contractors and owners to enforce contract specifications, building codes, and zoning ordinances; and also inspects soils, asphalt, concrete, building construction, and underground utilities at the project site.

Civil Drafter: drafts detailed construction drawings, survey drawings, topographical profiles, related maps, and specification sheets used in planning construction of highways and streets, buildings, river and harbor improvements, landfills, flood control, drainage, railroads, airports, water and sewer systems, and other civil engineering projects using Computer Aided Drafting systems.

Civil Soils-Materials Technician: samples and performs tests on soils, hot mix asphalt, concrete, aggregate, and other construction materials; and identifies and classifies soil samples for foundation construction and environmental purposes.

Survey Technician: obtains data and makes computations pertaining to angles, distances, elevations, points, contours, and other purposes using levels, total stations, data collectors, global positioning systems, and other surveying instruments following approved surveying practices.

The program also meets the educational requirements to become a Licensed Land Surveyor in the State of Wisconsin.

With additional education and/or work experience, graduates may find other opportunities for employment.

- Civil Engineer
- Construction Superintendent
- Building Inspector
- Civil Designer
- Construction Project Manager
- Surveyor

Requirements for Program Entry

- Completed application.
- High school transcript or equivalent (such as an HSED or GED® Transcript).
- NWTC Academic Skills Assessment or equivalent (See Academic Skills Assessment section for details and equivalents).
- High school background in mathematics, science, and drafting.
- Attendance at orientation or a planned meeting with program staff is required.
- Students must have had two years of high school algebra, one year of high school geometry and an acceptable Academic Skills Assessment College Math score or have completed or tested out of Intermediate Algebra w Apps, course 10-804-118, before taking the following First Semester program courses:
 - Soil Mechanics
 - Surveying/Mapping
 - Trigonometry w/Apps
- Beginning with applications submitted for Fall 2008, students will be required to take the Accuplacer College Level Math assessment instead of the Algebra assessment. The benchmark grade for Civil Engineering Technology on the College Math assessment is 63.

Curriculum

The Civil Engineering Technology-Associate Degree is a two-year plus one summer semester program. Upon graduation, a student will have completed 68 credits.

First Semester

Catalog No.	Description	Credits
10-606-112	Engineering Applications	1
10-606-113	CAD	2
10-607-119	Civil Drafting Technology	2
10-607-121	Surveying/Mapping	3
10-607-128	Soil Mechanics	3
10-801-196	Oral/Interpersonal Comm	3
10-804-196	Trigonometry w Apps	3
Semester Total		17

Second Semester

10-607-102	Land Surveying/Computer Appl	1
10-607-110	Cemented Aggregate Mixtures	4
10-607-125	Civil Public Works Construct	2
10-801-195	Written Communication	3
10-804-195	College Algebra w Apps	3
10-806-154	General Physics 1	4
Semester Total		17

Summer Semester

10-607-191	Civil Engineering Internship	1
Semester Total		1

Third Semester

10-607-131	Surveying 2	4
10-607-134	Surveying-Drafting	3
10-607-135	Statics/Strength Matl-Civil	4
10-804-198	Calculus 1	4
10-809-172	Race Ethnic & Diversity	3
Semester Total		18

Fourth Semester

10-607-147	Water Technology	3
10-607-151	Highway Surveying	2
10-607-152	Construction Meth/Bldg Syst	2
10-607-153	Global Positioning Systems	2
10-607-154	Land Law 1	3
OR		
10-607-132	Civil Engr Tech Topics	3
10-809-198	Intro to Psychology	3
Semester Total		15
Total Credits		68

Suggested Electives:

Land Law II, 10-607-155

This program is fully eligible for financial aid.

Accreditation

The Civil Engineering Technology program at NWTC is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), 111 Market Place, Suite 1050, Baltimore, MD 21202-4012, telephone: (410) 347-7700.

Please Note

- Some courses have prerequisites (listed at the end of each course description, if applicable) that need to be taken prior to enrolling in those courses.
- Many courses are offered via our Flexible Learning Options (online, accelerated, ITV, video, weekend, and self-paced) and may be taken in any order as long as prerequisites are met. To find out which program courses are offered through Flexible Learning Options, go to www.nwtc.edu or consult a counselor, (920) 498-5444.
- Descriptions of courses not found on this page can be found in the back of this catalog.

Course Descriptions

These courses provide an opportunity for students to develop the knowledge, skills, and understanding required for employment in this field.

10-606-112 ENGINEERING APPLICATIONS ...basics of a computer system, computer terminology, Windows XP, Microsoft Word, Microsoft Excel, and AutoCAD.

10-606-113 CAD (COMPUTER AIDED DRAFTING) ...computer aided drafting using AutoCAD software focusing on template settings; creating and manipulating layers; basic drawing, editing, and inquiry commands; blocks and attributes; and plotting. (Corequisites: 10-607-119, Civil Drafting Technology OR 10-606-119, Technical Sketching OR 10-614-113, 2D Essentials)

10-607-102 LAND SURVEYING/COMPUTER APPLICATIONS ...overview of a mapping software for applications in land surveying for mapping, contouring and calculations. (Prerequisites: 10-607-121, Survey & Mapping; 10-606-113, CAD)

10-607-110 CEMENTED AGGREGATE MIXTURES ...inspection/testing concepts, sampling procedures, aggregate properties, PCC mix design methods, HMA design, field laboratory quality control testing. ACI Grade I and WisDOT PCCTEC certifications are available through this course. (Corequisite: 10-804-195, College Algebra w Apps)

10-607-119 CIVIL DRAFTING TECHNOLOGY ...the architecture, engineering, and construction industry; fundamentals of drafting; measurement, scaling, and dimensioning; multi-view drawings; and design and construction print reading. (Prerequisite: Acceptance into the Civil Engineering Technology program)

10-607-121 SURVEYING/MAPPING ...basic surveying principles, history of land, surveying, instruments in the field, making computations, and generating computerized maps. (Corequisite: 10-804-196, Trigonometry w Apps; Accepted into Civil Program)

10-607-125 CIVIL PUBLIC WORKS CONSTRUCT ...horizontal curves, sewer/water systems, civil engineering mapping, field inspector roles, and CAD applications. (Prerequisites: 10-606-113, Computer Aided Drafting; 10-804-196 Trigonometry w Apps)

10-607-128 SOIL MECHANICS ...origins of soil, properties/characteristics of soil, soil classification systems, subsurface exploration, foundations, moisture-density relationships, soil compaction, and groundwater. Certification in the use and transfer of portable nuclear density gauges is available through this course. (Prerequisites: 10-804-118, Interm Algebra w Apps; Accepted into Civil Program)

10-607-131 SURVEYING 2 ...closed traverse measurements, traverse adjustments, data collection, rectangular coordinate use, land area computation, public land subdivision, land descriptions, horizontal circular curve field layout/computation, and computer applications. (Prerequisites: 10-607-102, Land Surveying/Computer Appl; 10-804-195 College Algebra w Apps)

10-607-132 CIVIL ENGR TECH TOPICS ...opportunity for study of current and advanced topics relating to Civil Engineering Technology. (Prerequisite: Instructor approval.)

10-607-134 SURVEYING DRAFTING ...survey tie drafting, survey map plat drawing, certified survey map drawing, subdivision/preliminary plat drawing, and basic use of AutoCAD and a software in the preparation of drawings. (Prerequisite: 10-607-102, Land Surveying/Computer Appl)

10-607-135 STATICS/STRENGTH MATERIALS-CIVIL ...force analysis, moments, resultant and equilibrant forces; coplanar, concurrent, and nonconcurrent systems; static friction; basic relationships of stress and strain under axial, torsional, and bending loads; properties of construction materials. (Prerequisite: 10-806-154, General Physics 1; 10-804-195, College Algebra w Apps; 10-804-196, Trigonometry w Apps)

10-607-147 WATER TECHNOLOGY ...hydrostatic pressure, continuity of flow, conservation of energy, flow in pipes under pressure, open channel flow, sewer design, water quality, wastewater treatment, rainfall, and reservoirs. (Prerequisites: 10-806-154, General Physics 1; 10-804-195, College Algebra w Apps; 10-804-196, Trigonometry w Apps)

10-607-151 HIGHWAY SURVEYING ...vertical curves, road design, volume calculations, site planning, astronomical observations, and construction staking. (Prerequisite: 10-607-131, Surveying 2)

10-607-152 CONSTRUCTION METHODS AND BUILDING SYSTEMS ...building components, construction methods, construction materials, plans, specifications, and print reading. (Prerequisites: 10-607-110, Cemented Aggregate Mixtures; 10-607-125, Civil Public Works Construction; 10-607-128, Soil Mechanics)

10-607-153 GLOBAL POSITIONING SYSTEMS ...introduction and history of GPS; latitude, longitude, and state plane coordinate systems; static, rapid static, and kinematic positioning systems. (Prerequisites: 10-607-121, Surveying and Mapping; 10-804-195, College Algebra w Apps)

10-607-154 LAND LAW 1 ...registration laws of Wisconsin, history of property law, laws of evidence, performing a property survey, adverse possession, unwritten rights, professional liability/stature and role of the land surveyor in court. (Prerequisite: 10-607-134, Surveying-Drafting)

10-607-191 CIVIL ENGINEERING INTERNSHIP ...the application of theory, skills, and techniques in the civil engineering profession. (Prerequisite: Instructor approval.)